

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA

UMI[®]
800-521-0600

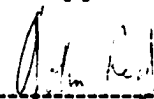
An Atlantic Canada Studies Masters Thesis

**Lichens Dyes and Dyeing:
A Critical Bibliography of the European and North American Literature
in a Culturally Marginalized Field**


Copyright by Karen (Leigh) Diadick Casselman, 1999

A thesis submitted in partial fulfillment of the requirements for
the Masters of Arts Degree in Atlantic Canada Studies
at Saint Mary's University
September 22, 1999

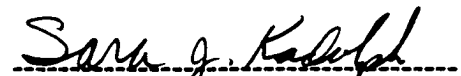
Thesis approved by:



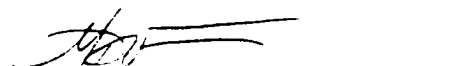
Dr. John G. Reid, Supervisor



Dr. D.H.S. Richardson, Reader



Dr. Sara Kadolph, Reader



Mr. G. Douglas Vaisey, Reader



National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*

Our file *Notre référence*

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-47675-8

Canada

ABSTRACT

This thesis provides a critical survey of scholarly and popular literature on the subject of lichen dyes as an overlooked aspect of human culture and technology. My research identifies confusion and contradiction within the historical narrative and widespread disagreement among authorities in European and North American literature. The result is marginalization and trivialization of a subject whose botanical, cultural and economic history span four thousand years. My research identifies a 1st century interpretation of indigenous northern European lichen dyes as the basis for modern studies that supply archaeological evidence to support a rewriting of European dye history. The revision I propose begins here with a lexicon to confirm lichen dye names that pre-date medieval orchil by more than a millennium. Botany and etymology will clarify historiography. But the marginalization and trivialization of the past will continue unless we re-examine the culturally-enshrined model of Celtic dyeing and replace it with a new paradigm based on ethnic practise outside the cultural mainstream. Historical examples of the new model include an 18th century Canadian account of aboriginal practice in the region of Hudson's Bay. The Sami dyers of arctic Norway are a prime model of contemporaneous practice. This thesis also identifies a distinct 20th century Francophone praxis, and contemporary lichen dye research in Nova Scotia.

**LICHEN DYES AND DYEING:
A CRITICAL BIBLIOGRAPHY OF THE EUROPEAN AND NORTH AMERICAN
LITERATURE IN A CULTURALLY MARGINALIZED FIELD**

Preface

Introduction 1-15

Bibliography 16-204

Glossary . 205-206

Appendix 207-210

Author index 211-219

Botanical index 220-235

Name index 236-244

Place index 245-252

Acknowledgements

PREFACE

Two missing books served as the original motivation for this thesis. That these important books (Lindsay's leather-bound set of lichen dye notes and samples circa 1855; and Hoffmann's 1787 treatise) are temporarily lost to scholarship suggests the need for a current and comprehensive bibliography. My utter dismay over the 'leakage' of these two historical texts - classic references essential to North American and northern European research (and the fact that until my queries, no one had noticed the books were missing) - made me determined to prepare a bibliography now before more is lost.

Added to my concern was a growing list of examples of lichen dye misinformation on the part of otherwise authoritative sources, erroneous and confused citations in literature that spans 2,000 years. These errors illustrated what I saw as the root of the problem - not a lack of scholarship so much as a lack of agreement. Authoritative sources relied upon for years have been neither analyzed, nor recently reevaluated in critical terms. But the final motivation to begin a descriptive and interdisciplinary bibliography occurred when the editor of *Dyes in History and Archaeology* asked me to prepare a short bibliography of lichen dyes. Although I was unable to do it at the time, I did make comments on a draft of the article which is included here as Cooksey 1997. The thirty-odd sources I suggested as additions were such that I had barely 'scratched the surface' in regard to *my own library*. The uneven value of the information in regard to its relative abundance pointed to the need for a more in-depth treatment. I also made a pragmatic decision that the lack of 'lichen' and/or 'dye' in the title would not exclude a source otherwise useful on merit alone, or as a comparison.

In this thesis I have focused with few exceptions on northern Europe and North America, locations that reflect my 1981-1999 field work. Australasian sources included are those whose authors are known to me, or to colleagues, who in the case of Japanese texts also translated for me. The limit in my primarily English and French language skills meant a reliance upon translations in regard to Scandinavian languages, as well as old Norse and old Swedish. In certain cases my sources provided self-translations which are so noted in the annotation.

The thesis includes an introductory essay; the annotated bibliography section; author, botanical, name and place indexes. An Appendix and Glossary are also provided. The title reflects my interest in the subject of dyes and dyeing but I do not for the purpose of this thesis make a distinction between 'dyes' as a permanent colourant and 'pigments' as a semi-permanent colourant, for the molecular change in product and substrate that occurs in the former is missing in the latter, a point not essential to my study.

Just as there is the need to reappraise reliable references and identify doubtful sources, I have also come to the conclusion during this research that there is value in drawing attention to flawed works. Unless material is analyzed anew, within a cultural context, the problems in the literature will be unintentionally perpetuated. I have also included in this thesis those pioneers I have known personally, to whom cultural veracity is all important. My annotations reflect those who have had a profound effect on my work. Arguably this may have affected my judgement in assessing their value which I acknowledge here as a possible bias.

The anticipated diversity of readers is also reflected in what I have included and omitted. Approximately one quarter of the entries annotated in this thesis comprise material of questionable accuracy. On balance, however, I have devoted a similar portion of the bibliography to a body of material that I believe to be largely unknown and yet of considerable value. Both categories include books and articles drawn from archaeology, botany, chemistry, ethnology, history, and the humanities. If lichen dye studies are to be useful as a tool in historiography, which according to my interpretation of the subject is certainly appropriate, then scholars will come to recognize according to their disciplinary needs those references that isolate and identify significant details missed in other works. There are also a considerable number of sources used here that represent archival materials - unpublished notes, pamphlets, papers, lectures and self-translations which include in some cases my comments on provenance. This information will provide others with a reference trail especially in the case of personal archives such as my own.

My experience as a practitioner, a teacher and a lichenologist has persuaded me to apply an interdisciplinary perspective. I know that dyes and pigments are but one of many human uses of lichens. I see the essential paradox inherent in the subject - that dyes, perfumes and cosmetics are derived from lichen substances which are colourless and odourless *themselves*. This awareness of both the intangible and economic value of lichens will lead to a greater understanding of lichens as an overlooked aspect of human culture.

No one has analyzed the various cultural uses of lichens by aboriginal societies in Canada and the United States, and within this broader context applied scrutiny to the apparent and puzzling lack of specific tinctorial applications in the northeast. This lack of attention highlights the value of what I argue in this thesis may well be the earliest reference to aboriginal lichen dyes found thus far in all of North America. This bibliography draws attention to indigenous technological developments here, and elsewhere.

Those who have brought me to this broader concept of lichens as organisms with unique cultural attributes are acknowledged elsewhere, along with my gratitude for their patience and counsel. But there would have been no beginning without one woman whom I have never met. Described by her niece as an 'autodidactic scholar,' and by her family as a 'hermit', Eileen Bolton's passion for lichen dyes motivated me to find the threads of her life. The fact that she died weeks before I arrived in north Wales encouraged me to use her story as an example of cultural marginalization. The lack of recognition is another paradox; the worldwide impact of her book, *Lichens for Vegetable Dyeing*, was the first indication I had that the subject of lichen dyeing was of universal interest to individuals in disparate fields of study. Yet in life, Bolton was as marginalized as her subject, and virtually unknown.

I began to tabulate every book, regardless of language, that cites Bolton 1960 and/or 1991. This has become a ritual, especially at libraries in other countries. That there are thousands

of such books - written in English, French, German, Japanese, Spanish, Portuguese, Icelandic, Finnish, Swedish, Norwegian, Færoese, Danish, Dutch, Estonian, Latvian, Italian, Greek, Turkish, Serbo-Croatian, Indian, Pakistani, Chinese, Korean, and in all likelihood, many more languages - is her legacy. It is also indicative of the breadth and depth of interest in the subject that indicates there is the need to continue. In spite of more than 250 references I have annotated, there is still no consensus in regard to the identification of specific ingredients in the dyes described in this thesis; nor is there agreement to date on a single lichen dye name.

That I continue to be passionately involved in my subject after twenty-five years draws from me what I recognize and value as the best I have to give. Energy and enthusiasm are one thing; scholarship, quite another. I have come to academe rather later than most. Thus I have approached this bibliography in a way that reflects both my present and my past work as a dyer and weaver, textile teacher, craft writer and lecturer, a bibliophile, and what George Llano calls "a lichenist" (his polite designation for lichenological workers who lack a PhD.) That I am also inexorably in the historiography of my subject is yet another personal bias. In this thesis I hypothesize, however, that the majority of those who have observed, recorded or written on lichen dyes have done so from a single perspective; and that unidimensional focus has done little to advance the subject. An interdisciplinary approach provides a perspective that acknowledges academic research while at the same time it reflects the value of praxis and empirical knowledge. I have made cudbear, korkje, and orsallia; observed biodiversity in countries where dyeing once flourished as a commercial industry; witnessed practice by diverse ethnic groups; and most importantly, enjoyed the benefits of personal contact with Rita Adrosko, Fred Gerber, Su Grierson, Lillias Mitchell, David Richardson, Gösta Sandberg, Seonaid Robertson, Winifred Shand, and a host of others.

To achieve this result I have not put aside the tools of history. My interpretation reflects a deep-seated conviction that lichens, lichen dyes, and other human applications of lichens, are

the artifacts *of* history just as I have myself operated from *within* that history. Lichen dyes have artifactual value, cultural value, economic, interpretive and societal value. The fact that my understanding of material culture was broadened by John G. Reid and Colin Howell reflects their interdisciplinary interpretation of history which, like my choices for this thesis, includes rather than excludes class, culture, ethnicity, gender, labour, and race. I also recognize the paradox of dyeing as a form of cultural expression that marginalizes contributors such as Bolton while it enshrines examples such as Marion Campbell.

An unspoken question lies at the very heart of my research. Even among those who know what I have done and what I continue to investigate and study, there is even among friends, family, and colleagues a lingering concern that this subject may be intellectually inferior to topics in cultural history that I might have pursued. They recognize this same marginalization as an academic liability. Where once I tried to refute this, I now prefer to offer evidence to the contrary in the form of work done to a level that approximates what has been achieved by my peers. The same archives, the same libraries, documents, books, periodicals, journals, photographs, exhibition catalogues and sources have informed me as they have other students, writing on other subjects. I have taken no shortcuts to history.

Like me, others have taken the minutiae of human civilization - one theme, one idea, one object, one form of praxis - and exhaustively invested its nuances, its subtleties, and its ramifications within the larger context of history. And while the dominant group does not necessarily recognize, support or otherwise validate what I have chosen as my specialty, I will defend utterly my right to have made such a selection. And I am extremely thankful for the academic support from the Saint Mary's University community where the standard applied to my work has not been 'adjusted' in any way. Not for an instant has my inalienable right to have made such a choice been challenged or questioned, except to cause me to reflect on my motivation, and in the best possible sense. That should suffice the critics of 'trivial', yet that is not the case. Routinely I face suggestions that my subject material is marginal. I wish

to note that no such lack of support has come *at any time* from faculty at the university where I have done my research. "With your writing skills," I have been advised, "you could tackle anything." My answer to such challenges is that I will leave 'anything' to others who because of their age or experience or life goals seek for their inquiry a subject more consistent with society's recognition of what has cultural, historical, scientific, or artistic value. That I see dyeing as an instrument of culture speaks to my abilities as a recorder, an observer, a practitioner. This experience has been mobilized here to produce a definitive study. What I seek is the intellectual right to be the one to examine the subject here and now; the one to follow the footsteps of outstanding scholars whose interpretation has formed the foundation of this, the first cross-disciplinary and multidisciplinary analysis of the subject.

But my interpretation may be off-putting to entrenched cultural interests when my research touches as it frequently does on sensitive issues such as the artificial portrayal of praxis; cultural exclusivity; Eurocentricity as experienced by certain cultural groups *in* Europe; and polemics. How is it that textile authorities ignore scientific conventions in regard to botanical nomenclature, a standardized system of descriptive Latin names now in place for almost two hundred years, when the craft writer is expected to be exact, precise and correct? Also relevant here is a comment from a peer reviewer when one of my papers was rejected for publication. "The author", wrote an anonymous British reviewer, "cannot possibly have read the diversity of the sources included in his bibliography." There were two blind assumptions here; one was that my familiarity with Latin nomenclature suggested maleness; and the second presumption was that I did not have access to the sources I cited. These same sources are now *and were then*, within arm's reach.

Others will have this thesis as a starting point to examine such ironies, or the paradox of how a subject that has been marginalized is culturally misappropriated as often as it is overlooked. Whenever we need to validate ethnicity, a cauldron of crottle and the hearty lichen dyer clutching a spoon, are summoned to the rescue. But what we lose in this artificial portrayal

are cultural distinctions. Mythology results when we reduce praxis to a familiar but trivialized symbol. Disciplinary blinkers also have led also to the marginalization of dyeing due to the mysterious nature of lichens themselves. The fact that lichen dyes have survived four thousand years only to become fakelore, a neo-pioneer craft in a disappearing wilderness, or a symbol of cultural verification for tourists, demonstrates the need for a more sophisticated and nuanced appraisal.

This thesis identifies a distinct form of Canadian praxis as linked to the aboriginal culture of Hudson Bay as it is to Atlantic Canada, rural Maine, the Hebrides, or arctic Norway. I am inexorably part of that history to an extent far greater than is the case with most graduate students. To extend the paradox inherent in this thesis, this is not an enviable position. We who are 'in the history we 'make', as my professor Colin Howell has suggested, come perilously close at times to the 'cacophony of subjectivity' ¹ identified as a peril of modern historiography. The bibliography I have prepared confronts my own biases to incorporate what John G. Reid suggests as preferable in that regard. "As always," he notes, "it is easier to diagnose the faults of past scholarship than to find new perspectives."²

My perspective is innovative because it shows how past problems in historiography and errors in modern works can be understood within the broad context of an interdisciplinary analysis, one that provides solutions to avoid future misunderstandings. Upon this foundation I have staked my claim that we must rewrite textile history in order to recognize studies of unprecedented merit that identify the significance and value of lichen dyes and dyeing in the story of humankind.

¹ Colin Howell. (1999). Title of keynote address, Atlantic Canada Workshop. Kingston, ON: Queen's University, October 15-17, 1999.

² *Acadia, Maine, and New Scotland: Marginal Colonies in the Seventeenth Century*. Toronto: University of Toronto Press, 1981; Preface, xii.

ESSAY

Introduction

This thesis provides a critical survey of scholarly and popular literature on lichen dyes and dyeing as an overlooked aspect of human culture and technology. My subject is not one that falls conveniently within a single discipline. I have put aside disciplinary constraints to examine sources in art and craft, archaeology, botany, chemistry, ethnology, the humanities, natural history, science, social history, economics, and textiles. My scrutiny is also more personal than most as this thesis identifies my own cultural, intellectual and philosophical biases.¹

My concept of lichen dyes and dyeing as marginalized derives from 250 confusing and contradictory sources whereby the subject is neither science nor history, nor exclusively craft. Chemistry is integral to dyeing because the substances contained within lichens are the source of the dyes² but methods to extract these pigments are only accessible in craft manuals of variable usefulness.³ There are ecological issues related to the harvest past and present, and questions as to the sustainability of a commercial lichen harvest to make cosmetics and perfumes.⁴ Much of the historical confusion stems from disciplinary and cultural biases; these preferential interpretations are no different from my own way of seeing the subject, which at times is undoubtedly subjective.

Marginalization is further reinforced by the paradox of lichen dyeing which emerges even

1 Where I refer to my own work in this essay (Casselman 1980-2000d) the citations correspond in all subsequent footnotes to individual listings in the bibliography which comprise the main portion of this thesis.

2 Chicita Culberson, *Chemical and Botanical Guide to Lichen Products*. Chapel Hill: University of North Carolina Press, 1969.

3 Notable is Su Grierson's *The Colour Cauldron: The History and Use of Natural Dyes in Scotland*. Tibbermore: Mill Books, 1986. While Casselman 1980 and related writing are widely available, peer-reviewed articles are not often read by craft dyers: "Lichen dyes: ethical aspects relevant to northeastern taxa," *Maine Naturalist*, Vol. 2 (2), 1994, p. 61-70.

4 *Ibid.* See also D.H.S. Richardson, "Medicinal and other economic aspects of lichens." In: M. Galun (ed), *Handbook of Lichenology*. Boca Raton: CRC Press, 1988, Vol. 3, Chapter XIIB, p. 93-108.; and *The Vanishing Lichens*. Newton Abbot: David & Charles, 1975);

from a postmodern analysis. Gender, ethnicity, and a need/necessity paradigm are aspects of the historical narrative. To MacLagan, lichen dyeing is the domestic labour of women,⁵ but in modern Uist, it is men's work.⁶ The question of agricultural labour versus rural leisure is exemplified by Norwegian examples. In Flekkefjord region the 19th century lichen harvest involved working roped, on cliffs, which was risky;⁷ yet today, Sami women gather lichens to make value-added dyes for rugs sold at a craft co-operative,⁸ a harvest which as I observed *in situ*, involves no danger whatsoever. The paradox in North America is a lingering perception of widespread native practice, but as a subject of academic inquiry,⁹ most dyes so recorded represent a value-added model of modern praxis. James Isham's 1743 observation of aboriginal lichen dyes in the Hudson's Bay¹⁰ represents a rare contemporaneous account of historical aboriginal lichen dyeing, the only one found during this research. Also identified is the post-war social aspect of lichen gathering as a recreational activity in rural Nova Scotia.¹¹

As demonstrated in this thesis, lichen dyeing is folklore, mythology, and vernacular culture. But the dye names of ethnically-particular products and terms relevant to praxis have evolved in a haphazard manner that further marginalizes the subject. The need for consensus is identified in this thesis where I suggest there is a real need to encode specific dye names in regard to the ethnic origins of certain lichen dye products, and clearly identify their botanical ingredients.¹²

5 "On highland dyeing and colourings of native made tartans." *Transactions of the Royal Scottish Society of Arts*, 1898, Vol. XIV, p. 386 - 410.

6 M. MacLean & C. Carroll (eds.), *As an Fhearann (From the Land): Clearance, Conflict and Crofting, A Century of Images of the Scottish Highlands*. Edinburgh, Stornaway & Glasgow: Mainstream Publishing, an Lantair & Third Eye Gallery, 1985, p. 53.

7 O. A. Høag, *Planter of Tradisjon* (Norse Flora in the Oral Tradition). Oslo: Universitetsforlaget, 1976, p. 142-161.

8 Kåfjord Kommune, *Råmogoddon/Greneveving. (Clothing and Rug Weaving)* Manndalen & Osaka: Manndalen Husflidslag & National Museum of Ethnology, 1997.

9 S. Brough, "Navajo lichen dyes". *The Lichenologist*, Vol. 20 (3), 1988, p. 279-290; N. Turner, *Plants in British Columbia Indian Technology*. Handbook No. 38. Victoria, BC: British Columbia Provincial Museum, 1979.

10 *Isham's Observations on Hudson Bay, 1743*. E.E. Rich (ed). Montreal & Toronto: Champlain Society, 1949.

11 May Stronach, "Weaving in Nova Scotia." Address to the 1942 Provincial Handcraft Conference, Saint Frances Xavier University Extension Department, Antigonish, N.S.

12 Casselman 2000b.

Dye Methods

Appendix 1 includes three primary categories of lichen dyes defined in methodological terms. Brough was the first to apply specific names to traditional methods which he designated as AFM (ammonia fermentation method) and BWM (boiling water method) lichen dyes.¹³ I amended the first acronym to 'AM' after a discussion with Gerber¹⁴ who felt that the alkaline nature of the AM process disqualifies it as 'fermentation.' I added a third acronym, POD¹⁵ to describe photo-oxidized dyes from *Xanthoria*. Vernacular dyes are also further identified by origin and ingredients. This thesis identifies PCD dyes as a Scandinavian contribution, one as ethnically particular as BWM crottle¹⁶ is to Gaelic regions of Europe. But the name most often misused is orchil which in this thesis refers only to AM dyes made from the tropical lichen genus *Roccella*.¹⁷ Definitive sources¹⁸ recognize orchil as distinct from vernacular European equivalents but the name of this, the most ancient of all lichen dyes, is marginalized and culturally devalued when it is routinely misspelled and misinterpreted by scholars.¹⁹

Lichen Chemistry

Lichen chemistry is a complex subject that excludes non-scientific readers, for the dyes derive not from the lichens themselves but from acids within lichens that function as dye precursors.

13 "Navajo lichen dyes," p. 280.

14 F. Gerber & W. Gerber, "Dye Plants of the Deep South." In: P. Weigle, ed., *Natural Plant Dyeing*, Brooklyn Botanic Gardens, 1973, p. 17-18. The most current opinion included in this thesis is that of S. Kadolph, "Fermentation and Natural Dyeing." Abstracts of the Seventeenth Annual Conference of Ars Textrina, St. Paul, MN, June 1999, p. 13-14.

15 *Lichen Dyes: A Source Book*. Monograph # 1. (Cheverie, NS: Studio Vista Publications, 1996.) I have traced this dye to J.P. Westring's classic study, *Svenska Läfvarnas Farghistoria* (Stockholm: Delén, 1805).

16 See crottle in the Glossary, p. 205.

17 A. Kok, "A short history of orchil." *The Lichenologist*, Vol. 3 (2), p. 248-272. See also C. Woodward, "Vernacular names for *Roccella*." *Bulletin of the Torrey Botanical Club*, Vol. 76 (4), p. 302-307. Both identify orchil as *Roccella*.

18 *Ibid*.

19 G.W. Taylor continues to misspell as 'Rocella' the Latin name of the genus from which orchil derives; "Ancient textile dyes." *Chemistry in Britain*, Vol. 26 (12), 1990, p. 1155-1158. *Roccella* is also misspelled in the same way in S. Robinson's *A History of Dyed Textiles* (Cambridge, MA: M.I.T Press, 1969). These are noteworthy in regard to Engelbertus Jorlin's 1759 thesis which identifies the spelling as *Roccella*. It also demonstrates 'signposts' in what I characterize in this thesis as the 'misinformation highway.'

In the case of AM dyes these are depsides and depsidones²⁰; and the substances involved in BWM dyes are classified as aromatic and/or aliphatic compounds.²¹ It is admittedly a challenge to grasp the chemical paradox, that colourless and odourless lichen substances create not only dyes but also perfumes; thus few craft writers include any mention of lichen substances whatsoever.²² Another problem in craft literature is lichen identification. One writer²³ claims this difficulty is surmounted when one buys dye lichens, a doubtful strategy when those who sell them know little more than those who purchase lichens. Another example indicates that in spite of the availability of information in reliable sources, there is apparently little impetus to change; one recent book locates *Roccella tinctoria*, a semi-tropical species, "in the mountains of Canada".²⁴

Confusion as to lichen identification and chemistry is not a recent phenomenon. The topic of lichen dyes is "a subject in a most unsatisfactory condition"²⁵ according to the Scottish physician/botanist William Lauder Lindsay, a mid-19th century opinion that reflects the debate ongoing even then. "We stand, he continues, "in want of a series of investigations"²⁶ to improve what Lindsay noted as inferior work in the case of Stenhouse,²⁷ one of several rivals in the competitive arena of early Victorian science. Today it is not uncommon for tinctorial applications to be included in scientific studies which examine a biological context for lichens. Richardson is an example of those lichenologists who identify a number of environmental

20 S. Grierson, D. Duff & R. Sinclair, "Natural dyes of the Scottish Highlands", *Journal Society of Dyers & Colourists*, Vol. 101 (July/August 1985), p. 220-228); Y. Solberg, "Dyeing wool with lichen substances" (*Acta Chemica Scandinavica*, Vol. 10, 1956, p. 1116-1123).

21 *Ibid.*

22 Exceptions include Bolton, *Lichens for Vegetable Dyeing* (London: Studio Books, 1960; see also the 1991 edition); and Grierson 1986.

23 F. Mustard, *Dyeing the Natural Way*. (Mateson, Il.: Greatlakes Living Press, 1977).

24 T. Van Stralen, *Indigo, Madder and Marigold: A Portfolio of Colours From Natural Dyes*. Loveland, Co: Interweave Press, 1993; p. 110.

25 *A Popular History of British Lichens*, London: Lovell & Reeve, 1856, p. 85.

26 *Ibid.*

27 J. Stenhouse, "Examination of the proximate principles of some of the lichens." *Philosophical Transactions of the Royal Society of London for the year 1848*. Part 1: p. 63-89.

applications of lichens, their use in monitoring pollution,²⁸ and the value of lichens to birds and other fauna.²⁹ These benign uses may further marginalize dyeing if the public recognizes ecological applications as 'beneficial' and 'dyeing' as unnecessarily exploitive. One lichenologist in particular has applied the analysis of cultural Marxism to include a controversial view of modern lichen harvesting for the pharmaceutical trade as labour that identifies rural poverty when juxtaposed with the value-added aspect of the perfumes so made.³⁰

The Ethical Debate

Exploitation in regard to pharmaceuticals is relevant to this thesis because dyeing is also targeted by ecological conservatives. My motivation to raise ethical issues³¹ was generated by criticism³² that overlooked two important distinctions. One is that modern dyeing is a *domestic* artisanal practice which cannot reasonably be compared to the *industrial* dye trade of the past. Nowhere is the confusion that surrounds lichen dyes more obviously in need of scrutiny for there is within the literature a tendency to equate 18th century manufacturing with modern craft praxis. This is an inappropriate comparison. Moreover, the lichen harvest for the cosmetic trade is sufficiently exploitive in ecological and human terms as to be deserving of criticism, yet few scientists target that industry.³³ To equate the artisan who occasionally makes dyes³⁴ to the industrial products of a commercial harvest is not a balanced or a valid argument.

28 D.H.S. Richardson, *Pollution Monitoring with Lichens*. (Slough: Richmond Publishing, 1992)

29 *Ibid.* See also "Lichens and Man". Chapter 9 in: D. Hawksworth (ed.), *Frontiers in Mycology*. Lectures from the Fourth International Mycological Congress, Regensburg, 1990, C.A.B. International, 1991.

30 T. Moxham, "The commercial exploitation of lichens for the perfume industry." In: E. J. Brunke (ed), *Progress in Essential Oil Research*. Berlin & New York: Walter de Gruyter & Co, 1986, p. 491-503.

31 My IAL paper, "Ethical considerations" (Casselman 1992b) was the first one delivered at an international lichenological symposium that identified the need for such a debate.

32 Vociferous voices in the anti-dye lobby were R. Filson & R. Rogers (*Lichens of South Australia*, Netley: Government Printing Office, 1979) and B.J. Starkey ("Dyers threaten lichen flora", *British Lichen Society Bulletin*, No. 40, May 1977).

33 Moxham 1986, *op. cit.*

34 That lichenologists are themselves craft dyers is illustrated in my article which includes a colour photograph of Swedish lichenologist Lief Tibell wearing a lichen-dyed sweater spun, dyed and knitted by his own hands. "Scandinavian Dye Studies", Part 1: *Ontario Spinners & Handweavers Bulletin*, Vol. 36 (2), 1993, p. 13.

Solutions in my 1992 IAL paper included recommendations to both scientists and dyers. I suggested that lichenologists educate the public in regard to linking the diminution of lichens to habitat loss. I presented revised dye formulas based on a 1:10 lichen to fibre ratio (see below). I began as well to address my own biases. Among personal solutions I redirected my energies away from weaving projects that required an amount of lichen-dyed fibre in excess of two kilos.³⁵ I also returned to small-scale experimentation according to the Bolton model,³⁶ and redirected my attention to historical research. Methodological changes included the development of AM and BWM dye processes that were not species dependant.³⁶ Included in later work³⁷ was the philosophy of 'salvage botany' and the use of organic material already detached from substrate as a means to foster collection strategies that avoid waste. The purchase and sale of dye lichens was also discouraged. I invited more lichenologists to assist dyers with correct lichen identification, a cooperative gesture which many appear pleased to do.³⁸ Moreover, I urged scientists to recognize over-criticism as a risk when it produces a counter-reaction in the form of clandestine activity.

Lichen to Fibre Ratios

If lichen dyes have remained marginalized, the confusion in dye manuals is partly to blame; for if the contradiction continues it will prevent the type of ethical scrutiny that was absent in the past, one that I acknowledge here as a necessary component of modern craft praxis. Precisely how much lichen one requires for dyeing is not a question with a single answer even in books generated by the same publisher.³⁹

35 A 1993 handwoven blanket titled "Antiquity" acquired by the Smithsonian Institute (illustrated in Casselman 2000d) contains approximately 1 kilo of orsallia-dyed fibre.

36 The principle advanced here is a simple one: to combine various species reduces the pressure on specific lichens which are perceived to give the 'best' dyes; Casselman 1993a, 1996 c & 2000d.

37 Relevant here are my articles 1992a,b,c; 1993b; 1994 a,b,c.

38 Eileen Bolton was assisted by American lichenologist Mason Hale and Peter James of the British Museum Natural History; James also helped Annette Kok; Hale assisted Patricia Perkins ("Ecology, beauty, profits: trade in lichen-based dyestuffs through western history." *Journal Society Dyers & Colourists*, Vol. 102, July/August 1986, p. 221-227.) My own studies have been likewise facilitated (see acknowledgements).

39 Compare conservative ratios in J. Lloyd's *Dyes From Plants of Australia and New Zealand, A Practical Guide for Craftworkers* (Wellington: A.H. and A.W. Reed, 1971) with more excessive ratios in a second New Zealand book by the same publisher: M. Duncan, *Spin Your Own Wool and Dye It and Weave It*, 1973.

In recent dye manuals included in this thesis, lichen to fibre ratios vary from 1:1 or an equal weight of lichen to fibre in preferred sources such as Grierson 1986, to unclear and poorly described ratios that are four times greater in Bliss 1981. The amount of lichen required is often completely unqualified as in Duncan 1973 where there is no indication if the ratio applies to AM or to BWM dyes. A comparison of ratios in ethnically-particular books such as Simmons 1985 and McGrath 1977 indicates excessive amounts in the former, while the latter compounds the problem with recipe complexities that are only useful if they deter the novice from over-harvesting lichens. Under-valued contributions such as Wickens 1983 are as likely to offer sound advice in regard to how little lichen is actually required than are more popular books such as Fraser 1983.

Lichens weigh little. The collection of four times as much lichen as the weight of the fibre to be dyed, as represented in a 4:1 ratio, demonstrates scenarios whereby harvesting for dyes has the potential to inflict considerable damage on lichen populations. This reality is precisely the reason why dye formulas require scrutiny and adjustment. The problem of excessive ratios is exemplified in craft literature. One textile publisher, Interweave Press, publishes within a period of less than eighteen months two contributions that contain widely divergent ratios. One is an article featuring a 1:1 ratio for BWM dyes and a 1:10 formula for AM dyes;⁴⁰ the other, a dye manual in which the AM lichen to fibre ratio is described as a "1000 percent WOG" solution.⁴¹ An attempt to decode this 'weight of goods' methodology⁴² exceeded the combined interpretive resources of myself and two other experienced dyers, one a museum textile curator (Laurann Gilberston: see Gilberston 1999); the other, a textile professor and dyer (Sara Kadolph: see Kadolph 1999). Notwithstanding what is possibly a typographical error in a book that contains problems in this regard, any dye formula that requires what we interpret as 1000 times more lichen than the 'weight of goods dyed' is too grossly extravagant

40 "A lichen dye primer," annotated as Casselman 1992 c.

41 Van Stralen 1993, p. 111.; for her 'WOG' explanation see p. 29 & 61.

42 I asked Gilberston and Kadolph to help me undertake this exercise at the Humboldt Institute Natural Dye Seminar, Steuben, ME, August 30, 1998. Our interpretation suggested a ratio so excessive we questioned the accuracy of the text in this regard. The point is moot because this same book misidentifies *Rocella* (see footnote 24) and exhibits a lack of practical knowledge of lichen identification.

to be published. Vague amounts in craft manuals old and new, as demonstrated, illustrates why lichenologists such as Starkey 1977 and Filson and Rogers 1979 targeted dyers.

As indicated, there is no 'standard' ratio. Moreover, there is also no basis for a comparison between domestic lichen to fibre ratios and the amount of raw material required to make commercial dyes such as cudbear. Such dyes are interpreted in this thesis as an *industrial* process distinct from domestic dye-making, one that required technical trappings not available to the domestic dyer, equipment such as the "rolling hogsheads" described by Bancroft 1813.⁴³ Logan 1833 mentions historical lichen harvesting figures but there is no indication how the volume of raw materials required relates to industrial methods which according to Crookes 1874, Stenhouse 1848 and Ure 1858, involve fine points of chemical engineering. Industrial espionage may also have played a role in the tendency to secrecy evidenced in Bancroft 1813 where the author claims he does not know the exact industrial specifications for cudbear, a dye whose heyday had by then come and gone.⁴⁴

Specific lichen to fibre ratios relevant to industrial methodologies must be the subject of speculation; nor is it possible to quantify domestic vis à vis industrial figures. But lichen to fibre ratios in excessive amounts and volume dyeing have helped to develop solutions. Brightman and Laundon 1985 is one example in this regard. While there appears to be a lack of suitable lichen dye studies or what some interpret as a reluctance to support such work,⁴⁵ an apparent precedent was set in 1998⁴⁶ when a British lichenological journal published a review of a lichen dye study that includes conservation advice. Future co-operation will lead to mutual agreement on ways to prevent the historical depletion of the past which is identified in this thesis as primarily an industrial harvest.

43 Bancroft, p. 300.

44 *Ibid.* See also C. Gordon, "Memorial of Mr. Cuthbert Gordon Relative To The Discovery and Use of Cudbear. *Journals of the House of Commons*. Vol. XLX, 1786, Section 305: 963-977.

45 Kok 1966 and Brough 1988 are the only two dye studies published in *The Lichenologist* in the last two decades. *The Maine Naturalist* published Casselman 1994b & c as part of its cultural/natural history mandate.

46 See Hill 1998.

Standardization of Dye Names

Nowhere is the marginalization of dyes and dyeing more conspicuous than when it occurs in a science text by an expert on the subject of lichenology. Mason E. Hale is recognized as just such an authority (Hale 1979, Hale 1983, Hale & Cole 1988). But when in 1983 Hale applies the term "crottal" to AM instead of BWM dyes⁴⁷ he identifies what is a primary interpretive problem in the literature examined in this thesis. Moreover, Hale's lapse is significant precisely because of the attention paid in his case to every other aspect of botanical detail. There is still no standardization of dye names, and Hale's problem illustrates what is a persistent lack of consensus. I also note that crottle (see Glossary) is used indiscriminately⁴⁸ in sources in this thesis that span several centuries. Crottle is, depending upon the source cited, those lichens used specifically to make BWM dyes; any or all dye lichens in general, regardless of category or type; all lichen dye processes (i.e. AM and BWM dye methods); and/or the colours obtained from any or all lichen dyes. Ironically, the crottle reference in early sources such as Martin 1695 is as useful in this regard as are current sources such as Fenton 1978 and Fraser 1983 where folklore and mythology obscure fact.

Recognizing that crottle and crotal "have suffered much in use",⁴⁹ Grierson applies the names interchangeably but exclusively to BWM dyes. But she stops short of suggesting the standardization I refer to in 1992 and 1994⁵⁰ when I advise that to avoid confusion the term should be reserved for BWM lichen dyes made from *Parmelia omphalodes* and *P. saxatilis*. This statement also recognizes the botanical, economic and cultural distinction of orchil which as noted (Glossary) is applicable only to dyes based on *Rocella* spp. Crottle and orchil distinctions now allow for AM dyes made from other genera to be identified as 'orchil-type'.

47 *The Biology of Lichens*; Third edition. London: Edward Arnold 1983, p. 130.

48 Perhaps we should blame Mairé 1916 who uses crottle indiscriminately; or Bolton 1960 who is included in Hale's 1983 bibliography, although she recognizes the ambiguity of the many vernacular AM and/or BWM dye names.

49 *The Colour Cauldron*, p. 170.

50 In "Ethical Considerations (p. 3) I imply that crottle should be restricted to BWM dyes made only from *Parmelia* spp. but I do not expressly recommend the adoption of this one name for BWM dyes so made. In Casselman 1994 a, b & c, the point is stated with additional emphasis.

Cultural Paradox: Marginalization and Trivialization

My view of lichen dyeing as one way of seeing and knowing, of understanding both past and present, recognizes the inherent paradox of the observer's biases and cultural reality. One goal of this thesis is to provide a broader concept of dye-making as an instrument by which to measure ethnicity.⁵¹ But the controversy of the ethical debate has reflected attention away from historiographical and cultural research projects at a time when, in my opinion, such studies could have prevented the trivialization that was inevitable in a climate of neglect. My hypothesis that lichens are artifacts⁵² demonstrates how dyeing is now used to analyze culture. Textiles sources once considered definitive⁵³ voices in the narrative are no longer adequate in this regard for they ignore issues of gender and status.⁵⁴ Moreover, newly-discovered patterns of settlement (Barber 1999) defy existing historical interpretations. Changes in laboratory analysis have also led to additional archaeological evidence of lichen dyes in northern Europe (Pritchard 1990, Taylor & Walton 1983, Walton & Taylor 1991) at a time that predates previous accounts by a millennium. These significant advances identify dyes as useful tools in human culture; next we need to re-evaluate dyes as artifacts, and re-appraise how we record the evidence they provide. This cannot happen if the subject remains marginalized.

In *Problems in Materialism and Culture*⁵⁵ Raymond Williams addresses what he perceives to be the need to circumvent the isolation of an object or practice before locating its components, or indicators of cultural value. Williams advises an alternative approach; first we discover the nature of a form of cultural expression (in this case, dyeing), after which we then explore

51 Ethnicity and gender are relevant Sami lichen dyeing in my annotation of Kåfjord Kommune 1997. See also p. 2 of this essay.

52 "The case for lichens as artifacts of material culture." Paper presented at an ACS 660 seminar (Dr. C. Howell), January 1998. See also *The Gorsebrook Papers*, Casselman 2000b.

53 Franco Brunello, *The Art of Dyeing in the History of Mankind*. Venice: Neri Pozza, 1973.

54 A discussion of gender and status of ancient purple dyers is included in A. Muthesius' "The Byzantine silk industry: Lopez and beyond." *Journal of Medieval History*, Vol. 19, 1993, March/June, p. 1-67. Also relevant here is "Praxis and Paradox", a paper presented at an ACS 620 seminar (Dr. J. Reid) November 25, 1998. [See also Casselman 2000b.]

55 London: Verso, p. 46-48. Also relevant here is Williams' opinion that the dominant culture undervalues *what it cannot recognize* (my italics).

*its conditions*⁵⁶ as a context. This thesis provides such a context. Dyes are not inconsequential so much as under-recognized in regard to societal indicators of cultural value.

In seminar papers relevant to this thesis (Casselman 2000a), I explore the ideas of Jules David Prown⁵⁷ to arrive at a concept of lichen dyeing as an artifact of culture; that is, a form of cultural praxis and at the same time, an artifact that has its own cultural context. Also relevant to my interpretation of lichen dye historiography is what Williams describes as "human practice outside the dominant mode".⁵⁸ Lichen dyeing is nothing if not outside the norm. In cultural terms lichen dyeing is beyond the recognition of what most of society identifies as having value, yet lichen dyes are what writers muster, paradoxically, as 'proof' of ethnicity.

Still the dominant group does not identify 'dyeing' as a worthwhile academic topic. This is to be expected in a society that devalues what is done with the hands. But to explore the conditions of praxis, the attitudes towards practitioners, the nuances of ecology, botany and chemistry applicable to methodologies past and present - all this has value. It is value I see in the women's work of non-dominant cultural groups⁵⁹ where lichen dyes are now recognized as a value-added component. The irony here is that praxis persists not where it is perceived to thrive, in Scotland, but elsewhere. Yet how we comprehend human culture in regard to the role, rank and status of the dyer is relegated almost exclusively to the interpretation provided by Scottish sources⁶⁰ who have constructed an elaborate cultural enshrinement in regard to crottle and the lichen dyer. This thesis shows such a portrayal to be invalid.

56 Williams finds that cultural context is a condition rather than a component of praxis; *Culture* (London: Fontana, 1980, p. 128-9).

57 "Mind in matter: an introduction to material culture theory and method." *Winterthur Portfolio*. 1982, p. 1-19). Also helpful is A. Condon's use of hermeneutics as an analytical tool in the study of objects: 'The celestial world of Jonathan Odell,' in: G. Pocius, ed., *Living in a Material World*. St. John's: Memorial University 1991, p. 92-126

58 *Culture*, p. 43.

59 As indicated in footnote 8, the Manndalen Sami women's craft co-operative is a prime example. Others are noted in Gilbertson & Colburn 1997.

60 My annotation of among others, Carter & Rae 1988, MacKay 1976, Manners 1978 and Yeadon 1990 focuses on how one specific dyer is mythic in her ability to make crottle for tweed she spins and weaves for daily visits by tour buses.

Perhaps the ultimate cultural paradox of lichen dyeing is how I use 'Eurocentricity' in this thesis. I contend that where lichen dyeing continues as a valid form of cultural expression, as at Manndalen, Norway, such praxis is marginalized at the expense of the Hebridean model. A flawed paradigm is the result of a Eurocentric vision that recognizes one European culture while it marginalizes another whose practices are perceived to have less cultural, economic, and/or historical value. This explains the marginalization of Eileen Bolton, the enshrinement of Marion Campbell, and possibly why my own 'Celtic' expertise was disqualified in regard to a recent textile thesis (Carlson 1997) when the author's query "Are you Scottish?" produced a response that suggested I was culturally inappropriate to function as a resource.

As recently as 1973 British textile historian Kenneth Ponting identified these on-going polemics with his complaint that "The difference between cudbear and archil has never been satisfactorily explained."⁶¹ *To lack agreement on fundamental issues such as dye names, after two thousand years, underscores the depth of the problem. Moreover, the acrimony over dye names is comparable to the disagreement over Latin names for we have only recently begun to identify the botanical ingredients in AM and BWM dyes.*⁶² Such distinctions are significant if we are to identify indigenous lichen dye products vis à vis imported dyestuffs as a step toward historical definition and literature clarity. The growing body of interpretive literature relevant to medieval studies⁶³ provides abundant evidence that this is a timely project. Distinctions are essential if we revisit Pliny's prescient interpretation of orchil-type northern dyes in the Roman period, based on his claim that "...the French inhabiting beyond the Alps have invented the means to counterfeit the purple of Tyros...with the juice only of certain herbs."⁶⁴ To have an interpretive reference of this quality, more than one thousand years

61 William Partridge, *A Practical Treatise on Dyeing*, London, 1823, p. 254: (Ponting's comments are in his notes to the London 1973 facsimile edition published as *Pasold Occasional Papers*, Vol. 1).

62 Casselman 2000b is the first attempt to provide archaeologists and historians with a research tool for this purpose.

63 Prime examples annotated in this thesis include J. Furley, *The Ancient Usages of the City of Winchester*. Oxford: Clarendon Press, 1927; and T. Hunt, "Early Anglo-Norman receipts for colours." *Journal of the Warburg and Courtauld Institutes*. Vol. 58, 1995, p. 203-209.

64 *Pliny's Natural History: A Selection from Philemon Holland's Translation*. Clarendon edition, 1964, J. Newsome (ed.), p. 208; Centaur edition, 1962, P. Turner (ed.), p. 199.

before the advent of Florentine orchil, and to ignore or overlook it (with the notable exception of Taylor & Walton 1983) suggests that no one had the confidence or expertise to support as I do in this thesis their interpretation of Pliny's 'weeds of the sea' as AM dye lichens.

It has long been perceived in a vague and generalized fashion that lichen dyes originated in Celtic regions and that these earliest examples are BWM dyes.⁶⁵ This thesis confirms that this crottle-dominated version of the narrative can no longer be supported due to what my research identifies as too little evidence. A Danish BWM dye in Rosenberg 1752⁶⁶ is among the earliest examples I have found to date, a fact that further disputes the portrayal of BWM dyes as necessarily ancient and/or exclusively Scottish in origin. Moreover, the paucity of European literature in this regard has significant ramifications for lichen dye historiography and aboriginal technology in Canada. The aboriginal BWM dye James Isham observes in 1743⁶⁷ not only pre-dates every European source in this thesis except Martin Martin 1695,⁶⁸ it is recognized here as not merely an unusual example, but one that is very rare indeed.

There is still insufficient evidence to suggest that the Akkadian dye that Perkins⁶⁹ interprets as orchil is the first or the only AM dye extant circa 2350 BC. This is precisely why we need to have opinions from scholars such as Barber 1999 who have the expertise to speculate on the Ürümchi dyes. Barber does not even suggest what dyes are under consideration. This is disappointing because the dyes in the Ürümchi garments are purples; moreover, they are purples used to overdye natural brown wool. Natural brown wool overdye with AM lichen purples is precisely the technique used to create the remarkable Greenland purples described by Walton Rogers in 1993. My research identifies such links and also records the widespread use of lichens to adulterate henna, the only dye Barber cites as the sole example.

65 Sources that put forth this as the accepted interpretation include Brunello 1973.

66 *Dorte Margete Rosenberg's Farvebog (Dame Margaret Rosenberg's Colour Book)*. Facsimile edition: Sara Wold & Esther Nielsen (eds.) Jutland: Blåvandshuk Museum, 1984.

67 *Observations on Hudson Bay, 1743, and Notes and observations on a book entitled a Voyage to Hudson's Bay in the Dobbs Galley, 1749*. E.E. Rich (ed.), Toronto: Hudson's Bay Record Society, 1949.

68 *A Description of the Western Islands of Scotland Circa 1695 Including a Voyage to St. Kilda*. Stirling: Eneas Mackay, 1934.

69 Based on her reading of Forbes 1964, where to my knowledge the reference first occurs.

Conclusion

This new knowledge will advance dye historiography. According to my interpretation, the revised narrative⁷⁰ will reflect the role of ancient orchil-type methodologies as vernacular products in northern Europe. One basis for this claim is the fact that orchil-type dyes are culturally unique in regard to botanical ingredients. Some sources in this thesis conclude that *Ochrolechia tartarea* was the primary lichen used in these vernacular products; but I suggest that *Lasallia pustulata* and other umbilicates⁷¹ were also used in northern orchil-type dyes. Such usage would replicate what was later a standard practice of substitution, one necessitated by depletion as was the case in the ancient world when murex was augmented by orchil. If my interpretation is correct, then we have substance to support what I describe in my annotation of O'Curry⁷² as a reference of significance in regard to the identification of pre-medieval Irish AM dyes based not on *Ochrolechia* spp., but on umbilicate lichens.

If a subject has been marginalized and trivialized, what is there to persuade us that further study will yield something of worth? Contradiction and dissent in the literature may have fuelled doubts as to the value of further discourse, but I have no hesitation in stating that I believe the reverse to be true. If there is a final paradox, it is that cultural tourism returns us to the pitfalls of the historical paradigm which we have struggled to avoid. For if lichen dye praxis is today 'enacted', rather than practiced (MacKay 1974); and falsified in regard to how it is portrayed in books, exhibits and museums (MacLean & Carroll 1985); relegated only to 'women's work' or recreation, then we have gone full circle. But if it is a means of interpreting gender, labour, ethnicity and status (Vågen & Engelskjøn, forthcoming) or offers insights into the microbial nature of the AM dye process (Kadolph 1999), or is geographically broadened in regard to praxis (Karmous & Ayed 1999); or expands an awareness of the link between dyes and health

70 Pritchard 1980, and the unprecedented work of Textile Research Associate (notably Taylor & Walton 1983, Taylor 1991, Walton 1988, Walton Rogers 1993) is the foundation of this claim; also of significance in their interpretation and mine is Kok 1966, and additionally in my case, Perkins 1986.

71 See my annotation of Taylor and Walton 1983, Walton 1988 and Walton Rogers 1993.

72 E. O'Curry, *On the Manners and Customs of the Ancient Irish, Edited with An Introduction, Appendixes, etc. by W.K. Sullivan*. Volume 1, 3. London & New York: Williams & Norgate, and Scribner, 1873.

(Abdulla & Davidson 1996), then lichen dyes and dyeing will continue to contribute to our understanding of human culture and history.

This can only happen if we reject mediocrity. We can no longer accept the platitude that orchil 'died out' after the fall of Rome, a myth perpetuated in the only doctoral thesis on the subject written within the past two decades (Tievant 1979). We will see in the persistent periodicity of errors that problems such as "Rocella" do not begin in 1989 with Walton, but are traceable through Taylor 1986, Geijer 1979, and Robinson 1969 back to Karr 1942. We will no longer consider definitive a text where an acknowledged authority, misidentifies Cuthbert Gordon as Cuthbert "Graham."⁷³ We may still smile at the mythology whereby a lichen dye tale Goodrich-Freer records in 1902 is totally reversed in meaning and intent in Shaw 1986, and further transformed in Keay & Keay 1994. Less amusing are the implications of the image of a lichen on the cover of a text book that is printed upside down⁷⁴, a mistake that underscores marginalization and trivialization of lichens as organisms.

This thesis can help in that regard. It will contribute new knowledge; provide a compendium of resources in a single document; motivate scholarship in other areas of textile technology; increase recognition of lichens as organisms; provide a current example of textile bibliography; amplify aboriginal technology; identify interpretive problems and provide solutions; justify the folklore; point to cultural contradictions; and interpret ethnic nuances inherent in the subject.⁷⁵ This thesis will also identify new directions for future research.

If we provide context, then cultural value will accrue to the subject of lichen dyeing.

73 Michael Ryder, *Sheep and Man*. London: Duckworth, 1983, p. 539.

74 Mason E. Hale, Jr., & Mariette Cole. *Lichens of California*. Berkeley: University of California Press, 1988.

75 Significant here is the little known body of literature that originates in French Canada (Beriau 1933, Soeurs 1941). This material parallels the US Department of Agriculture model (Furry & Viemont 1935) but is not necessarily derived from that tradition. That this literature is overlooked in *European* sources such as a French thesis that includes ethnic lichen dyes (Tievant 1979), exemplifies the 'marginalization' in my title.

CHRONOLOGY OF SOURCES

Readers' Notes:

The thesis is divided into historical time periods. **Authors** are listed alphabetically, in chronological order, within these periods. To quickly locate specific sources, the **Author Index** is cross-referenced by date (e.g. Brough 1984, 1988).

Surname Variations Notable in this thesis are variations in regard to Penelope Walton (who is also listed as Walton Rogers 1993); myself (listed as Karen Leigh Casselman 1980-1996, and subsequently as Karen Diadick Casselman). Variable also are George F. Hoffmann 1787 and Regina Hofmann 1997; Thomas Kilbride 1979 and references to his father, Val KilBride, and Harriss 1998. First name variations are relevant to Martin Martin 1695 and Su Grierson (Grierson 1986). Please also note the distinction between Acadian (Smith 1934, Chiasson 1972) and Akkadian (Forbes 1964, Perkins 1986)

Multiple entries by a single author are listed chronologically (e.g. Lindsay, William Lauder. 1851, 1854, 1855, 1868a, 1868b). **Page numbers** in the annotation refer to the source cited. Where the annotated text is relevant to my essay, page numbers are noted accordingly (see essay, p. 10).

See also [in brackets] refers to sources relevant to the work in question, other authors whose interpretation confirms the point being made, or whose opinion is contradictory.

Articles of significance that are contained in edited collections or conference proceedings are listed separately according to the author's name and the date of publication: examples are Richardson 1988 and Yacopino 1973.

Rare primary sources (i.e. Hoffmann 1787) that I have not read, and forthcoming articles, books and monographs (i.e. Brodo, Sharnoff and Sharnoff) are so indicated with an asterisk*.

These comprise approximately 1% of the material included in this thesis.

Non-English sources comprise 10% of the annotations. Translation has been provided by numerous colleagues who are either identified in the annotation (i.e. Almedal, in Lunde 1976) or included in my Acknowledgments.

Acronyms such as **AM**, **BWM** and **POD** are described in the Glossary: also included in the glossary are vernacular dye names such as 'crottle', 'cork', 'korkje' and 'stenlav', among others. A forthcoming work in progress will provide a comprehensive lexicon in this regard (Casselman 2000b). **Crottle** is the preferred spelling in this text except in cases where the particular spelling used by the source in question is pertinent to my annotation, as in Martin Martin 1695.

Dye methods are contained in Appendix 1. Comments on dye results and colours in thesis annotations are the result of my own experimentation and research relevant to *Lichen Dyes: A Source Book* 1996 and *Lichen Dyes: The New Source Book* 2000d).

Botanical names of lichens are provided in an index of same; readers should note that unusual spellings (i.e. *Lasallia pensylvanica*) correspond with Theodore L. Esslinger and Robert S. Egan's "A Sixth checklist of the lichen-forming, lichenicolous, and allied fungi of the continental United States and Canada." *The Bryologist*, Vol. 98 (4), 1995, p. 467-549. This study includes current names for 3,799 species of lichens found in North America. The recommended resource for British readers is O.W. Purvis et al 1992.

Prehistory to AD 1000

Barber, Elizabeth J.W. (1991). *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean*. Princeton, NJ: Princeton University Press. Hero Granger-Taylor, in a 1992 review of this book in *Textile History* (Vol. 23/[4, p. 261-264) cites what is in his opinion a problem "of factual accuracy" in the section on dyes (p. 262). He takes exception to the fact that Barber ignores *Dyes in History and Archaeology* in her bibliography and in her text; as I note in Casselman 1996c, to omit the unprecedented body of work done by Taylor and Walton is puzzling indeed. Compare, for example, Barber's many references to Ryder 1983, and see my interpretation of the veracity of his dye information. Granger-Taylor admits that Barber's "own intelligence and insight are never in question". Nonetheless, Barber at no time distinguishes between a pigment which forms a temporary attachment to fibre and what Granger-Taylor describes as a "dye proper," colour that forms a permanent bond. Nor do I make the distinction in this thesis. To get lost in the fine points of semantics is to miss the point; whether permanent or not, dyes reveal cultural data beyond the technicalities of molecular bonds. Granger-Taylor also notes the questionable provenance in regard to a number of Barber's dye dates. Of far more significance is that Barber's lichen references include neither species or genus which is significant in a study of this authority. When Barber cites Campbell Thompson 1934 to repeat the troublesome alum reference (p. 232), no lichens are suggested as possibilities; nor is there any effort made to interpret his textual references. Moreover, Barber's omission of murex methodology and morphology is inexplicable. I also suggest that Barber cannot do justice to the subject of dyeing when in a bibliography in excess of thirty pages she mentions only one dye manual; and that is Kierstead 1950. That Walton and her colleagues are not included, and Kierstead is, suggests that where dyes are concerned the author has applied a less discerning eye than is appropriate in a study of this magnitude. The historiography will not advance if academic studies marginalize dyeing by their dependence upon dated sources of doubtful merit, at the exclusion of more recent analysis.

Barber, Elizabeth J. W. (1994). *Women's Work: The First 20,000 Years (Women, Cloth, and Society in Ancient Times)*. New York: W.W. Norton. The numerous references to purple

in this, the second of Barber's trilogy, involve not lichen dyes but murex. Or more precisely what Barber interprets as murex (e.g. her reference on p. 211 to Homer's description of Helen of Troy weaving "a great warp, a purple double-layered cloak..."). Is Barber correct in her assumption that these purples are murex? At no time in this study on the gender-specificity of textile technology does Barber hint at other possibilities. A more serious lapse is that she does not name mollusc species, details now routinely included even by authors with less claim to scholarship (see Herald 1993). Nor is the morphology of murex included, or a description of how the dye derives from the hypobranchial gland. That there are reasons to mention orchil - or at least, to raise it in her discussion - is suggested by purple interpretations annotated here in Caley 1926, Gaius Plinius Secundus AD 77, and Perkins 1986. There is a considerable disparity in Barber's 'skin deep' treatment of gender roles in ancient textile production when compared to the comprehensive analytical approach of Muthesius in her 1993 discussion of the role of women in Byzantine purple manufacture. While many would agree that Barber's deconstruction of textile history advances the agency of women, it does little to support a similar advancement in regard to our understanding of women as dyers in the ancient world.

Barber, Elizabeth Wayland. (1999). *The Mummies of Ürümchi*. New York: W.W. Norton. This book is included because the mummies are clothed in reddish-purple garments. Although the dyes have yet to be analyzed (see my essay p. 13), the outcome of such tests could provide evidence for a revision of textile technology. The question as to whether or not it is valid to compare Barber to Sandberg (a historian, not a scholar) or to Muthesius (a scholar, and a historian) is answered possibly on the jacket of this book where Professor Barber is described as "the world's foremost authority on ancient textiles." Such descriptions, I would argue, are intrinsically unfair; but notwithstanding publishers' hyperbole, comparisons with the work of other scholars and historians are unavoidable when the dyes under discussion are relevant to discoveries of great importance. The mummified remains of Caucasians, in 2nd to 3rd millennium BC graves excavated not in Europe or in the Near East, but in the deserts of Xinjiang, China, are a case in point. (See also Haddingham 1994). That discoveries of this type rank as significant in regard to early migration and settlement is irrefutable. Professor Barber's tools include a firm grasp of geography, linguistics, semiotics, textile history and archaeology, and yet the language of the text suggests her audience is not a scholarly one. Instead, what

we learn is how and why Barber came to be involved as one of various international teams bent on 'some piece of the action' in regard to the Ürümchi mummies. Thanks to Norton's PR team these mummies have received front page and full-colour attention in the *New York Times* and the *London Times*; when Barber lectured in Australia in the spring of 1998 which is where I first heard her speak, interest was high. The popularization of archaeology is a controversial topic in academic circles. What it means here is that Barber's popular audience is unlikely to demand what she thinks about the origin of the colourants, four thousand year old dyes in virtually intact purple garments. Barber does describe the colours as "purply-red-brown" (p. 27); but uncertain, she continues, "...if that's what one should call such a hue. Plum? Maroon? Cherrywood? (*Ibid.*) There is more speculation on the hue: "This strange but attractive shade...must have been the favourite of the man's social group or of his family's weavers. I can compare it, " Barber claims, "only to the peculiar tint obtained by a brunette who hennas her hair (... a practice among Uyghur women as among New Yorkers), brownish in this light, reddish in that, with a glint of beet-purple highlights." (p. 28). She continues: "The comparison of the brunette who adds red dye to her hair and gets purplish highlights suddenly seemed... apt." (*Ibid.*) These words do not equate to analysis in a book devoted to textile finds of this importance. Furthermore, Barber at no point suggests any options for the unknown dyes. I do have a suggestion; for this thesis includes evidence that lichens are a component of henna, and/or a substitute for henna (see Lal & Upreti 1995; Richardson 1988). Commercial henna in the form of hair dyes is routinely adulterated with lichens, including a product I purchased in Trondheim, Norway, July 12, 1999 (Grieve 1931). Henna also dyes cloth. This is the type of suggestion we need from Barber in an exciting book that analyzes every other minutiae of weave structure, language, climate and geography.

Born, Wolfgang. (1937). "Purple". *Ciba Review*. See 1930-1939.

Caley, Earle R. (1926). "The Leyden Papyrus: An English translation with brief notes." *Journal of Chemical Education*, 3 (10), October, p. 1149- 1166. Based on Leeman's translation of the 3rd. century *Papyri Graeci musei antiquarii Lugduni Batavi*, Netherlands Museum of Antiquities, 1885, Caley includes the story of how this demotic Greek work came to be known as the 'Leyden Papyrus X'. More importantly, in purple recipes #95 and # 96, he interprets 'seaweed' as orchil. Caley's version of the orchil narrative is important because

it offers further evidence of usage circa AD 300, a time close to the period when orchil manufacture is alleged to have ceased, after the fall of Rome (see Brunello 1973, Høiland 1983). Caley's two articles are of special significance to my interpretation of the historiography of lichen pigments for precisely this reason.

Caley, Earle R. (1927). "The Stockholm Papyrus: An English translation with brief notes." *Journal of Chemical Education*, 4 (8), August, p. 979-1002. The late 3rd. century *Papyrus Graecus Holmiensis*, the so-called 'Stockholm Papyrus', was translated from the Greek in 1913 by Otto Lagercrantz and published simultaneously in Germany (Leipzig: Otto Harrasowitz) and Sweden (Uppsala: Akademiska Bokhaandeln). [For illustrations of the original *Papyrus Holmiensis* see Brunello 1973 & Sandberg 1997.] Caley claims this 1927 article represents the first complete English translation of the Stockholm Papyrus, "fifteen loose papyrus leaves...in an excellent state of preservation" (p. 980). His interpretation is of seminal importance. It confirms that orchil was widely used up to and including the 3rd. century AD; and not only as a primary dye. Past interpretations of recipes in the Leyden and Stockholm papyri, by authorities such as Brunello 1973, have focused at the exclusion of all else (or so it would appear) on the use of AM lichen dyes to produce fraudulent purples. That orchil was used for this purpose is not refuted by Caley, nor by Pliny or Gardner, who are entirely clear on that point. What Caley asserts, and I agree on this point, is that orchil was intrinsically valuable as a dye unto itself, in addition to being versatile as an additive in other dye processes. Caley makes reference to orchil used in combination with other dyestuffs (Sandberg 1997) to achieve the "double dipped" colours that are often interpreted as exclusively murex-dyed. The presumption has always been that more than one dip in murex is required to give added depth to the colours produced; in fact, a first dip in orchil, followed by murex - or the reverse - produces the desired depth of colour that characterises double-dipped cloths according to sources such as Rosetti 1548, Pomet 1694, Crookes 1874, and a host of others. This is the value of Caley's interpretation. Furthermore, Caley provides sufficient evidence that methodological applications in the distant past are entirely consistent with modern methods, as described in my Appendix. There are complaints, however, that the AM dye recipes here are too brief to be useful. That is true. But in my opinion what critics such as Geijer 1979 forget is that all technological instructions and recipes from this period in history were cryptic. Methods were vague, and record keeping, minimal. The makers were also not those

who recorded the processes. Caley has provided a remarkable document as a baseline, a foundation upon which subsequent interpretations of the historiography of dyeing will be constructed. This can happen only when we move beyond the arrogance that presumes the more recent past is the only technology worthy of note.

Campbell Thompson, R. (1934). "An Assyrian chemist's vade-mecum." *Journal of the Royal Asiatic Society of Great Britain and Ireland for 1934*. p. 771-785. Over the years there has been much debate as to whether or not the "scab of the wall" (p. 777) represents a lichen as it is interpreted according to Campbell Thompson, or some other red dye such as kermes. Wendy Robertson and I have discussed this as well. (Pers. com. October 3/98; see also Acknowledgements.) The problem lies not with the idea that lichens were unfamiliar dyestuffs (see Kok 1966, Perkins 1986). More to the point is the quality of lichenological advice available to Campbell Thompson at the time, and how this affected this scholar's translation. There are phrases here that make no sense in botanical terms, or in regard to dyeing. One of these is the much-quoted "lichen of tamarisk in alum". The confusion of the botanical description is magnified and it lingers when cited by authoritative sources such as Barber 1991 and Brunello 1973. Campbell Thompson suggests three possibilities for the mystery species in the Assyrian text. The first is "lichen pyxidatus" which is *Cladonia pyxidata*, one reputedly in the Gordon's cudbear recipe and discussed in Kok 1966. The second species suggested is "yellow wall lichen" by which the author means *Xanthoria parietina*, a lichen that makes POD blue dyes whose practitioners include Bærentsen 1987 and Upton 1990. The third lichen is presumed by Campbell Thompson to be *Roccella montagnei*. That is a logical choice; more far-fetched is the suggestion that the lichen in question might also be interpreted as the northern European species *Ochrolechia tartarea* which Campbell Thompson describes as from Ceylon (p. 778; see Van Stralen's 1993 reference to Mediterranean lichen in the mountains of Canada). Furthermore, Campbell Thompson is utterly convinced that alum is part of this dye process. My examination has led me to conclude that here is a possible reference to lichens not as a dye but as a mordant. Hofmann 1997 establishes such a use in Indonesia, and I have adapted a similar process for North American species (see Casselman 2000d). The 'misinformation trail' that links mordants to lichen dyeing, an application that is completely different from using lichens as a mordant, can be traced in my opinion to this paper with the intriguing scholarly title.

Forbes, Robert James. (1964). *Studies in Ancient Technology*. Leiden: Brill. Chapter 7 (Volume 4) contains "Red Dyes" (Table II, p. 103) where Forbes lists the Greek, Latin, Hebrew, Egyptian and Akkadian names for one particular dye he describes variously as 'archil' and 'orseille.' No one but Perkins recognizes Forbes' reference to an ancient Akkadian AM lichen dye by the name of 'puh' for what it is. I consider this to be *the earliest AM dye documentation* in any source included in this thesis. As the Akkadian culture flourished in Babylonia circa 2350BC, this date provides Perkins with evidence in support of her statement that orchil and similar lichen dyestuffs have been in use at least four thousand years. Forbes makes no claim that orchil-type dyes originated in Babylonia, but his Akkadian dye mention is notoriously obscure when compared to its cultural significance.

O'Curry, Eugene. For pre-medieval Irish lichen dyes, see O'Curry 1873.

Perkins, Patricia. For a discussion of Gaetulian purple (Africa; pre-AD) see Perkins 1986.

Plinius, Gains Secundus. (Pliny the Elder). (AD 77). *Pliny's Natural History*. Two popular British editions are "A Selection from Philemon Holland's Translation" edited by J. Newsome (Clarendon, 1964); and Paul Turner's "Selections From the History of the World: *The Natural History of C. Plinius Secundus*" (Centaur, 1962), a treatment also based on Holland. Ignored or overlooked by textile historians in Pliny's text is a significant reference to contemporary northern AM lichen dyes: "...the French inhabiting beyond the Alps," Pliny writes, "have invented the means to counterfeit the purple of Tyros...with the juice only of certain herbs." [KDC emphasis: Newsome p. 208; Turner p. 199]. In my opinion this is one of the most important references in the historiography of lichen dyeing. We have a history that recognizes 'herb' as a synonym for 'lichen' (see Edge 1914/15; Grieve 1931; and Turner 1551). While I do not dispute the existence of northern murex, in this case I would argue that Pliny's reference can be interpreted as a vernacular AM dye in use in northern Europe during a period that predates Florentine orchil by a millennium. Furthermore, there is now an increasing body of archaeological evidence to support such usage. When data provided by Taylor and Walton 1983 and Pritchard 1980 are added to my interpretation, there is a persuasive body of evidence to support Pliny's statement (see essay p. 12).

AD 1000 - AD 1499

Furley, John Sampson (1927). *The Ancient Usages of the City of Winchester*. Oxford: Clarendon Press. This book and Hunt 1995 document early medieval AM dyes in England that support recent archaeological finds. As noted below, archaeologists do not necessarily rely on scholars in other disciplines, and the reverse is also true. But when in 1991 Walton includes this study by Furley in her "Textiles" chapter in *Medieval Industries*, she had moved significantly toward the recognition of an existing indigenous trade in medieval AM dyes in northern Europe (compare Taylor & Walton 1983 and Walton 1994). This is a trade that parallels Florentine orchil, one based on lichens other than *Roccella*. In his preface Furley acknowledges permission from Winchester College to transcribe and publish the Anglo-French copy of this manuscript based on an early 'custumal' (guild dues and regulations; import duties; and taxes). In the introduction Furley accounts for various translations of this late 13th century manuscript, and claims that a new analysis is required. Some readers will find the cork reference too brief; item 53 in the Winchester custumal is merely a "two pence" tax applied to "every cart that brings cork for dyeing", and an even greater sum (one penny) for a "horse-load" of the dyestuff (p. 41). The significance of this bare mention, however, goes well beyond the monetary value of the taxes. The fact that an orchil-type dye is an item of trade in Winchester circa 1275 establishes that the product described is an indigenous AM dye of French and/or English manufacture (see Dallon 1997).

Hunt, Tony. "Early Anglo-Norman receipts for colours." *Journal of the Warburg and Courtauld Institutes*. Vol. 58, 1995, p. 203-209. According to Hunt, a classics scholar at Oxford, this late 12th century compilation was made at a Cistercian abbey in Nottinghamshire (p. 203). Citing numerous translations of medieval folios located in various European libraries, Hunt's analysis includes a British Library manuscript known as "MS Sloane 1754". Together with a 13th century manuscript in Madrid, Hunt argues that this documentation "constitute a complete corpus....representing the basis of our knowledge of medieval colour terminology and technology..." (p. 204). A number of dyestuffs are apparently described in the folios, including one made from "a moss or lichen" (p. 206). Hunt does not identify the species in his text but provides one instead, in footnote 26, which reads: "i.e. *Ochrolechia tartarea*." How correct

is Hunt to interpret a lichen "mixed with lime" as an orchil-type dye? Given Furley's evidence, it would appear fairly safe to speculate as this author has done. A number of AM dyes were in wide use throughout northern Europe at this point in time. Why does Hunt not cite Taylor and Walton, or Pritchard 1980 - or any of the archaeological evidence in support of his interpretation of lichen dyes? In my opinion the answer lies in the simple fact that the humanities are a discipline separate from archaeology and history. Scholars have not yet recognized the value of lichen dyes as a useful interpretive tool in a comparative literature analysis which is by its very nature, interdisciplinary.

Hartley, Dorothy & Margaret Elliot. (1926-1931). *Life and Work of the People of England: A Pictorial Record from Contemporary Sources*. 6 Volumes. B.T. Batsford. What value can be derived from a passing mention of lichen dyes that is neither footnoted, as in Hunt 1995, nor otherwise referenced to a specific text? In this survey the social and cultural history of England is juxtaposed with the development of the people and their technology. There is breadth in this treatment, but at the expense of depth. In "Notes on life and work in the fifteenth century" (Volume 2: AD 1000-1500), the relevant passage reads as follows: "Various barks, roots and lichens give quite bright dyes." (p. 32) Admittedly written as popular history, as were Hartley 1939 and 1979, these volumes nonetheless indicate the extent to which the historiography of dyeing is in general marginalized and minimalized in value. As domestic labour, textile production merits attention; but the veracity of lichen dye references such as this are suspect (i.e. compare Grant 1961) when an interpretation renders as cultural evidence the "is said to yield" category of assumption.

1500-1699

Dalrymple, Helen. "17th century dance costume: results of analysis." *Laboratories of the National Museum of Antiquities of Scotland*. Volume 2, 1985, p.111-117. This is a troublesome source. The final conclusion is that the date and provenance of the Perth Glovers' Dance Dress, a silk dance costume, cannot be determined with certainty. Nor can the identity of a lichen purple be confirmed (p. 113). What is troublesome about this paper is that the bibliography gives but one source: Professor Mark Whiting's 1978 report to the ICOM meeting in Zagreb on the identification of silk carpet dyes. The author states that the lichen

dye "did not match, exactly, any of our standard spectra of some of the many species of lichen" (p. 113). In view of the bibliographic omissions, Dalrymple's statement means little. It could have meant a great deal more were she to have cited the work of Taylor & Walton 1983.

Hakluyt, Richard. (1600). *The Principal Navigations, Voyages , Traffiques & Discoveries of the English Nation made by sea or overland to the remote & farthest distant quarters of the earth at any time within the compasse of these 1600 years*. 38 Volumes. 1926-31. London & New York. J.M. Dent; E.P. Dutton & Co. Much of the text here is given over to descriptions of the economic potential of botanical exploitation which next to geographic expansionism was the primary motive for "voyages and discoveries". Relevant to this thesis is Hakluyt's description in Volume 4 of Tenerife where "There groweth...a certain moss upon the high rocks called Orchel, which is bought for Diars to die withall" (Vol. 9, p. 27). The value of the Hakluyt reference is that it offers a comparison between his name for orchil and that of his contemporaries, including the 1533 Statute of Henry VIII, as described in Hurry 1930, and Turner 1551. What these variations illustrate are etymological interpretations that survive well beyond the 17th and 18th centuries (i.e. Stenhouse 1848). Because of the association with the Canary Islands there is no doubt that Hakluyt's reference is to *Rocella* spp. Mention of African and Asian scarlets and crimsons reflects the premiere value of these reds and purples in trade and fashion which when "shewed to the Diers hall" (Vol. 5, p. 43) will function, according to Hakluyt, as a means of encouraging indigenous production. The author identifies England's real need for botanical and technical expertise not dissimilar from the economic espionage that motivated the 19th century career of Pehr Kalm. "You shall devise to amend the Dying of England," he advises "by carying hence an apte yoong man brought up in the Arte..." who, back in England, will "of all the foreen materials used in dying to know the very natureall places of them, and the plentie or the scarcenesse of each of them." (Vol. 3, p. 93). Hakluyt's reference to biodiversity is stated within the context of economic opportunity in a period of brisk geographic discovery; what was not at hand could be brought back to England, an import philosophy he applies to lichens as well. "And if of necessity we must be forced to receive certaine colours from forren parts, for that this climate will not breed them, then...bring into this realme herbs... to become naturall in our soiles..." (Vol. 3, p. 97).

Martin, Martin. (1695). *A Description of the Western Islands of Scotland Circa 1695 Including a Voyage to St. Kilda*. Stirling: Eneas Mackay, 1934. "The stones upon which the scur corkir grows, which dyes a crimson colour, are found here," writes Martin, "as also those that produce the crottil which dyes a philamot colour" (KDC emphasis; p. 264). This sentence represents what may be the only 17th century documentation recorded in English historical literature wherein AM and BWM dyes are described as two distinct processes. This is as important a reference to the historiography of lichen dyes as is Taylor and Walton 1983. Martin is one of the handful of sources upon which we must pin our entire interpretation of centuries of traditional dye making in Britain. His brief but accurate description of two dyes recognizable by different methodologies also raises important questions in regard to how dye citations are made even in the best literature. A case in point is Grierson's vague reference to crottle "from the sixteenth century onwards" (1986, p. 172). Does she mean Martin? To be unclear about this would matter much less if there were numerous references to BWM dyes from the 17th and 18th centuries. As my annotation of Rosenberg 1752 indicates, there is a paucity of BWM dye references when compared to AM dyes during this period. What do we make of Boswell's claim that Martin is unreliable? Does Eurocentricity, in this regard, enter the story of textile history? In my opinion it does (see my essay). A lexicon of dye names, etymology and origins will help to establish the vernacular identity of specific dyes. It will also recognize the true cultural value of this very early highland (rather than Hebridean) example.

Pomet, Pierre. (1694.) *A Compleat History of Druggs Written in French by Monsieur Pomet [Chief Druggist to the late French King Lewis (sic) XIV To Which is Added What is Further Observable on The Subject by Msr. Lemery and Tournefort, divided into three classes, vegetable, animal and mineral; with their use in physick, chymistry, pharmacy, and several other arts*. The second English edition, 1725. London: Bonwicke & Wilkin. The translator of the English edition clearly did not know how to record 'orseille' (see Dallon 1997), and thus "orseil" (p. 93) is added to the growing list of vernacular names for historical AM lichen dyes. To add to the etymological confusion, this text also includes a reference to "Stone Turnsole" as a paste or cake form of orchil. "The Turnsol... called likewise orseil, is a dried paste made up with the fruit (of) Parelle, quick lime and urine; the colour of the paste will be blue" (p. 93). This blue colour certainly suggests why Kok, among others, has interpreted 'turnsole' as 'litmus'. [And litmus paper, made from lichens, is alsobblue.] But when laboratory-

quality litmus given to me in 1995 was tested by my students at the Conference of Northern California Handweavers workshop, they were disappointed the dyes we obtained were not blue, not purple, not *anything*. As for geographic variation in lichens, Pomet is of the opinion that Holland orseil is superior to what is produced in France. What I suspect here is that Pomet's Holland product is not the same thing as French 'orseil,' but a dye made with imported *Roccella* spp. But by including "Parelle", however, we can confirm that the author's reference to 'Lyons orseil' is to an indigenous product made from *Ochrolechia parella*. [For a discussion of the efficacy of *O. parella* versus *O. tartarea*, see Grierson 1986. Dallon 1997 also documents the history of 'orseille d'Avergne which approximates Pomet's 'orseil'.]

Rosetti, Giovanventura. (1548). *The Plictho of Gioanventura Rosetti: Instructions in the Art of the Dyers Which Teaches the Dyeing of Woolen Cloths, Linens, Cottons and Silks by the Great Art as Well as by the Common*. Translation of the first edition of 1548 by Sidney M. Edelstein & Hector C. Borghetty (eds.), Cambridge & London: The M.I.T. Press. [See also Brunello 1973, Robinson 1969, Sandberg 1997]. There are three remarkable aspects to this classic Renaissance manual that deserve attention. The first is that Rosetti includes an orchil recipe which due to its provenance and the richness of detail is not only much-quoted but fairly easy to follow (see Richardson's 1975 version). The book is also significant as it represents one of the more positive legacies in textile historiography and a fine example of Sidney Edelstein's textile scholarship. The modern edition redirects attention back to the puzzle in regard to the publication date (see Brunello 1973). In my opinion, that 'mystery' is not clarified in this edition as the editors intended. Throughout this text they refer to their translation as based on the 1548 edition, while at the same time, they maintain that the 1540 Plictho is "the *second* edition" (Introduction, p. xiii; xxii). A context for this confusing chronology is provided in the Introduction, but few who are not bibliophiles or antiquarians will follow the convoluted printing history. More to the point is the fact that Edelstein and Borghetty had available for this project all six known editions of the Plictho published before 1672. [Notwithstanding Brunello's archival evidence in support of 1548 as the *only* first edition, the debate takes on a somewhat personal note; for in their discussion of Rosetti's life and work, Edelstein and Borghetty claim that "recent extensive studies by Brunello have revealed little information": p. xiii)]. Notwithstanding scholarly disputes, what is indisputable is the editors' claim that this

book remained "of practical use to dyers" for more than two hundred years, and Brunello agrees. This translation required many years of work. The sheer duration of the process apparently replicates what was also true for the author himself. Notwithstanding the loss of sleep, blood and money the author claims to have been his sacrifice, what I enjoy even more is the passage where Rosetti declares that the knowledge in his manual has been "imprisoned for a great number of years in the tyrannical hands of those who kept it hidden..." (p. 89). What was of such value to imperil one's health and risk the retribution of competitors? The demystification of dyeing - a skill previously controlled and regulated by the state - became available to domestic dyers for the first time in this manual. Were these dyers apprentices who might set up their own shops, or possibly non-guild workers whose independent trade would draw customers away from guild-controlled dyeshops? If orchil as recorded in the Plictho represents the epitome of Renaissance simplicity, one can only image the obfuscation in the medieval process from which it derived. Rosetti reduces the process to a matter of one hundred pounds of lichen incorporated with alum and human urine which is "put in a corner" until it "works" (p. 120). [There are also recipes where orchil is combined with madder, indigo, cochineal and other dyestuffs: see Jaggard 1705.] Two aspects of Edelstein and Borghetty's considerable achievement are particularly troublesome. Had the editors only used 'orchil' instead of 'archil' they would have reinforced Kok's classic study and confirmed that etymology; surely scholars of this rank had access to her research? Furthermore, when they associate alum with the AM vat process Edelstein and Borghetty have inadvertently and for all time confounded those of us who develop new dye formulas and reinterpret older ones. Mordants such as alum are neither required with AM lichen dyes, nor is the vat process advantageously affected when they are used. What alternatives did the editors have to these problems of interpretation if they were to stay faithful to Rosetti's text? I suggest they might have stated in the introduction that 'archil' and 'orchil' are variants of the same word, and thereby pave the way for subsequent scholars to choose the former name for English AM dyes, and the latter for the southern European product. In regard to mordants, in more than two decades of practice I have not seen tangible evidence that the addition of alum (or use of alum pre-mordanted fibre) is of benefit to AM dyes in particular. Are there other possible explanations? Was Rosetti's inclusion of alum, like the *Cladonia pyxidata* in cudbear (see Kok 1966), meant to throw off the competition? Or is it possible that unrefined alum played a role in mitigating the odoriferous effects of human excrement in the urine which was collected in

a rather crude manner for dye-making? This is not a far-fetched suggestion; Bancroft claimed in 1813 that faecal contamination could spoil cudbear. Moreover, in my opinion we are wrong to interpret 'mordant' as having the same use today as it did in the past.

Turner, William. (1551). *A New Herbal*. 2 Volumes. G. T. L. Chapman & M. N. Tweddle (eds.); Cambridge: Cambridge University Press, 1995. Lichens used as medicines had as much economic value as did tinctorial applications, a fact illustrated in this book. Turner notes *Lobaria pulmonaria* (Vol. 2, p. 754) as a common 15th and 16th century remedy for pulmonary disorders, but significantly, does not identify the same lichen as a dye. Granted we have almost no documentation of BWM dyes from this period, but is there a link between so common a dyestuff missing in Turner's herbal and the conspicuous lack of archaeological evidence to support the use of BWM dyes before the 18th century? It is this deficiency in documentation that contrasts sharply with the growing abundance of textile evidence and literature references to medieval AM dyes as recorded by Furley 1927, Hakluyt 1600, Hurry 1930, and Hunt 1995. Turner does not disappoint the reader in this regard, for he includes abundant references to AM dyes such as "orchall" (Vol. 1, p. 308). Turner also describes a foreign plant that "growth like moss upon stones" in a location "beyond the sea" (*Ibid.*), which sounds like a reference to *Rocella*. If this book is to be valuable to dye historiography, however, we need a more concrete interpretation. I conclude that Turner's 'corck', which is an indigenous product and one he equates to "northern orchall" (Vol. 1, p. 308) is a complete confirmation of what Furley, Hakluyt, Hunt and Hurry identify as a parallel trade in AM dyes based not on *Rocella* but on indigenous northern lichens such as *Ochrolechia tartarea*.

1700-1799

Berthollet, Claude-Louis. *Elements de l'art de la teinture (Elements in the Art of Dyeing)*. (See Berthollet & Berthollet 1824].

Chambers, E. (1778). *Chambers' Cyclopedia*. Volume 1. London: Chambers Company. This encyclopedia contains little on lichen dyes that is not found elsewhere. Why, then, is it so often cited? Like other encyclopedias of the time, subjects are arranged in alphabetical order

but the lack of pagination presents a challenge. Chambers does provide 'archil' as a main subject entry, a product made from "a white moss" (possibly *Ochrolechia* spp.). Imported AM dyes are also included under this heading. *Roccella* is correctly spelled here, a significant detail in an early book when compared to studies such as Robinson 1969. The high price of imported orchil is noted. Why then is cudbear, the only indigenous AM dye of the period, conspicuous by its absence in this all-too-often-quoted reference of limited value? (See Rees 1819).

Ellis, John. (1769). "A catalogue of foreign plants as are worthy of being encouraged in our American colonies for the purpose of medicine, agriculture and commerce." *Transactions of the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge*. Vol. 1 (January 1769-January 1771), p. 255-269. There are very few references to imported *Roccella* in colonial America, and just as few recipes (Hills 1857, Rambo Walker 1840). This paper is significant as a rare mid-19th century source in North America that addresses the economic potential of *Roccella*. Ellis claims " 'tis possible this valuable plant may be found in our American islands, as well as in the Canaries and Cape Verde islands" (p. 264). [Later it was; see Perkins 1986] The link between AM dyes and agriculture, and the correct spelling of *Roccella*, add a measure of science and technology to what is an uncommon source. There are likely more such references to be found, but the quality here is high when compared with the more voluminous Watson 1757.

Fischer, Birthe Karin. *Uld og Linnedfarvning i Danmark 1720-1830 (Wool and Linen Dyeing in Denmark 1720-1830)*. Copenhagen: Rhodos, 1983. This study should be of particular value because it is based entirely on primary sources. Or is it? In the section on lichens Fischer describes archival materials relative to the career of Carol Adrian Hardt, a Swedish entrepreneur in Denmark who developed a dye for military uniforms, one based on "Norwegian moss" (p. 68). 'Moss' is an historical epithet for lichens that persists into the present century (Edge 1914/15). But subsequent references in the text to "orseille" and "persio" (p. 69) are not accompanied by any indication of genus or species. There is no attempt here to interpret evidence, to amplify references, or even to link 'moss' to lichens. In most circumstances we would be sufficiently grateful for more evidence that English cudbear" is "prepared from "Norwegian lichens" (p. 69). But as written here, the potential of a botanical

interpretation is not fulfilled. In a work that deals in depth with economic and social history, this is disappointing when compared with the manner in which Wold and Nielsen interpret recipes in Rosenberg 1752.

Gordon, Cuthbert. (1786) "Memorial of Mr. Cuthbert Gordon Relative To The Discovery and Use of Cudbear. *Journals of the House of Commons*. Vol. XLX, Section 305: 963-977. The origin of this pamphlet is not clearly defined, but my copy, provided by David Richardson (see Acknowledgements), has an attachment in the form of a letter dated September 4, 1985. The letter includes comments by a Brotherton staff librarian (Leeds) who delves into the complex history of the 'Memorial'. She feels certain the document was published a second time, but also in London, and has pencilled the date "1786?" on the front cover. Another reference to this 'Memorial' is in Albert Henderson's 1985 cudbear article where the author describes it this publication as a 25 pence pamphlet "available from the library of the Society of Dyers and Colourists, Bradford", a facility now adjacent to the Bradford Colour Museum. The contents of the 'Memorial' comprise a parliamentary petition which includes the origin of the dye whose etymology derives from Cuthbert Gordon's Christian name; and although not mentioned in the pamphlet, also from his mother's maiden name. Conspicuous by its absence in the pamphlet, however, is any mention of the actual dye ingredients. This not only underscores the competitive industrial climate of the age, as I note in my annotation of Hellot; it also provides a clue, according to my own interpretation of the patent details, that Gordon allowed some 'false leads' to creep into the list of dye ingredients. (Kok 1966 contains a description of what was in cudbear, one that is derived from the 1758 cudbear patent application. Clearly the main ingredient is *Ochrolechia tartarea*. In Grierson's opinion in 1986 and in mine, *Lasallia pustulata* was also used.) The Memorial is entirely focused on the issue of cudbear quality and the threat posed by imported lichens. It includes signatures from merchants and manufacturers in Wakefield, Halifax, Edinburgh, Galashiels and Paisley, all of whom attest to the calibre of the Gordon's product vis à vis imported dyestuffs. As an additional argument, Gordon has seen fit to append custom house records which show that 312 tons of "rock moss" were imported into London between April 19, 1781 and November 1783. He claims that to harvest indigenous lichens will benefit the country and in consequence protect his own product from competition. Unfortunately there is nothing here that is a clue to Cuthbert Gordon himself. The mythology that surrounds the man himself (was he actually

a physician, or a chemist?) and the names and number of brothers engaged in the dye business is the stuff of legend, about which not even the most definitive sources agree.

Hellot, Jean. (1750). *L'Art de la teinture des laines (The Art of Dyeing Wool)*. [See below].

Hellot, Jean, Pierre Macquer & LePileur D'Apligny. (1789). *The Art of Dyeing Wool, Silk and Cotton*. 1st English edition. London: R. Baldwin. Facsimile English edition; London: Scott, Greenwood & Company, 1901. Three French dyers whose individual works comprise what Sidney Edelstein described in Schetky 1964 as 'key books' who are represented here in typical 18th century fashion as a revised and expanded compendium of knowledge. But it is Hellot's 'grand teint' (great dye) and 'petit teint' (little dye) that surface here as fundamental to the interpretation of the subject of this thesis. Hellot is of the opinion that AM dyes made from *Ochrolechia parella*, *O. tartarea* and *Roccella* spp. are inferior when compared to other red/purple dyes. Lightfastness tests of elaborate design are used in this text to elaborate on French dye regulations designed to prevent commerce in non-fast dyes, rules that also protected indigenous dyestuffs. Mediterranean orchil was a competitive product to French AM dyes and it made economic sense to discredit it - which is exactly what this book accomplishes. But what also emerges is a clear indication that the authors do not understand precisely what archil/orchil is. "Those who prepare the herb archil," write these authors, "make a mystery of this preparation." (p. 201) This is questionable in light of sources in this thesis; but a clue as to the economic protectionism that mitigated against orchil is included in Jaggard 1705.) I believe there is another narrative here. Are the French dyers and their confusion in regard to both AM and BWM lichen dyes 'mile one' on the misinformation highway? There is evidence that this is the case. On page 204 AM and BWM dye methodologies are confused; the French dyers describe a BWM lichen ("Tinctorius sexatilis"; i.e. *Parmelia saxatilis*) as capable of producing 'archil', an error which has since then been endlessly perpetuated due to the perception that Hellot (whether solo, or in combination, as here) is the classic source in the historiography of dyeing. The most eminent of lichenologists fall into the trap of accepting Hellot's interpretation of lichen dyes as definitive. Smith 1921 is a case in point. Even Hellot's misspelling of 'sexatilis' survives into the present century as a rural Quebec BWM dye ("sexabilis") in Beriau (1933, p. 65). Nor can modern dye practitioners and researchers verify the claim made by the French dyers that a tin mordant in *Roccella* dyes (p. 209) produces a

more satisfactory product than orchil made without any mordants whatsoever. There is a good measure of sleight-of-hand on page 207 where the claim is made that "...this method of dyeing with archil (a method not described on the previous page) is so easy that as soon as you have made two or three trials...you will know more than [we] can possibly teach by the most elaborate description." (KDC emphasis). Preceding this statement on page 206 is the aforementioned "method" which ends with a claim that: "[We] cannot exactly determine the precise quantity of the ingredients in this operation." Contradiction and chicanery are to be found in artisanal manuals through the ages; but when one compares the work of the French dyers to the *Papyrus Holmiensis*, it is clear that fifteen hundred years did not necessarily see advancements in how dye-making was interpreted as technology. Hyperbole obscures this text and accentuates its weaknesses which in regard to the subject of this thesis are considerable. They are clustered in Chapter XXXVI ("Of Archil and The Method of Using It"), but may also extend to the remainder of the text which is likewise much overdue in regard to a new analysis.

* Hoffmann, George F. (1787). *De Vario lichenum usu commentatio. (A Commentary of the Various Uses of Lichens.)* Lyon. [See also Willemet, Amoureux & Hoffmann]. Culbertson 1969 gives Hoffmann's lifespan as 1761-1826 which suggests he was a recent medical graduate when he began an investigation of the economic potential of lichens in this publication. George Llano assures me this book *does* exist, although in Nation Union Catalog it is suggested that Hoffmann's "thesis" is, in fact, identical to Willemet, Amoureux and Hoffmann (below). I disagree with that opinion. As described to me by Llano, Hoffmann 1787 is a separately bound document in Latin which unlike the other publication, includes dyed fabric samples not unlike Lindsay 1851. [In Casselman 1996c I describe the considerable effort I made in 1992 to view the only copy I have ever been able to locate, at the British Library]. While I still have not seen this book, I am fairly confident that what was presented to me at the British Library as Hoffmann 1787 was, in fact, Willemet et al. The primary clue is that the latter is written in French, while the original Hoffmann 1787 is in Latin. Such details are possibly more obvious to the seeker of the rare book than to those who claim to have located it.

Isham, James. (1743). *Observations on Hudson Bay, 1743, and Notes and observations on a book entitled a Voyage to Hudson's Bay in the Dobbs Galley, 1749.* E.E. Rich (ed)., Toronto: Champlain Society for the Hudson's Bay Record Society, 1949. Dorothy Burnham

passed along to me over the years a number of early mentions of aboriginal lichen dyes which she found when researching her 1992 book, *To Please the Caribou: Painted...Coats Worn by the ...Hunters of the Quebec-Labrador Peninsula*. This is undoubtedly the most significant reference found to date in Canada. James Isham was a Hudson's Bay factor acknowledged by his peers as a man of sensitivity and sensibility, one who brought a love of flora from his native Orkney. The facsimile of his journal provides access to a very rare example of aboriginal lichen dye use particular to Canada in a period when BWM dye use - *even in Europe* - represents a spotty and incomplete record. The interpretation of his dye observations are thus extremely important. In Casselman 1996c I suggest this dye may represent the first documentary evidence of aboriginal BWM dye use in Canada. In research done for this thesis, I am prepared to go further and suggest it has considerable significance in all of the continent. The details are sketchy: "They also dye a very good yellow, with a sort of maw'se, taking(it) and putting it into a kete with quills...over a moderate fire... boiling (it) as they do (other dyes) - a very little of this maw'se, *even one ounce will dye some thousand quills.*" (KDC emphasis; p. 136). The lichen that comes immediately to mind is *Letharia vulpina*. When I used this lichen for BWM dyes myself, I noted that a single plant immersed in room temperature water creates a brilliant yellow in seconds. (See Turner et al 1990). But the answer to the identification of the species is not that simple; *Letharia* does not occur in the area of Hudson's Bay and/or Labrador according to John Thomson (*American Arctic Lichens. Vol. 1: The Macrolichens*; Columbia University Press, 1984). In an earlier study (Casselman 1996c) I suggested *Cetraria* as a more likely genus to consider but the range of that species lies somewhat north of the region in question (Thomson, p. 95). Since that time, two other possibilities have occurred to me: one involves genera such as *Dactylina* and *Thamnolia* which although normally used for AM dyes, also yield BWM yellows. The other possibility is that the dye Isham encountered represents a trade noted in Turner 1979. Whatever the answer may be, Burnham's methodical analysis of the skin coats she studied, is relevant here. Queries she addressed led to answers; and there are answers here if we continue to scrutinize the evidence and pose the right questions.

Jaggard, William. (1705). *Dyes and Dyeing Nature's Fadeless Colours: Over 300 Secret Recipes in Tinctorial Art*. Stratford on Avon: Shakespeare Press, 1926. Facsimile of the English translation of the German original. This book is almost universally ignored in dye manuals and overlooked by dye historians. But Jaggard contains dye recipes similar to other

books of the period such as Pomét 1694. Here the modernized text provides ready access to the very same orchil 'secrets' cryptically noted by Hellot. There are numerous references to orseille (p. 12, 136, 315) used alone and in combination with indigo and madder. Mention of Canary Island 'lursole' (e.g. 'turnsole') in the Appendix (p. CCCXVI) is especially interesting for this author's contemporaneous opinion of Bethancourt's monopoly of the *Roccella* trade. Jaggard suggests this was at the expense of indigenous and superior European products such as French 'orseille' (presumably *Ochrolechia parella*: see Dallón 1997); this recognition of value is in direct conflict with information in Hellot.

Johnson, Samuel & James Boswell. (1775/1786). *Johnson and Boswell in Scotland: A Journey to the Hebrides and Western Islands of Scotland*. Pat Rogers (ed.) New Haven: Yale University Press, 1993. The veracity of Johnson and Boswell's various accounts are a subject of vigorous debate among scholars. My contribution is a comparison of Boswell's lichen dye mention in a recent edition of the 'Hebridean Tour' with Martin's account. "They can all dye," writes Boswell in his 1786 description of Coll. "Heath is used for yellow; and for red, a moss which grows on stones" (p. 240). In this case the dye information here cannot compare in quality to Martin's 1695 contribution.

Jorlin, Engelbertus. (1759) *Plantae Tinctoriae (Dye Plants)*. My thesis clarifies the persistent mystery surrounding a thesis by the title of *Plantae Tinctoriae* which sources here (Llano 1944, Smith 1921) have long attributed to Linnaeus. But *Plantae Tinctoriae* is missing in Wilfred Blunt and William Stern's *The Compleat Naturalist* (New York: Viking Press, 1971), a biography and compendium of principal works published during Linnaeus' lifetime. This was a clue to the error. I identify *Plantae Tinctoriae* as a thesis by Engelbertus Jorlin defended at Uppsala on May 16, 1759. Jorlin was certainly a student of Linnaeus, who not only presided over the defense, but who also included the work of this, one of his numerous protégés, in *Amoenitates Academicæ*, Vol. 5, (1) 1760. Jorlin comments on six lichen dyes including *Roccella* by that precise name, according to the correct Linnaean spelling (compare Robinson 1969, Taylor 1990). The former is identified as a source of red and/or purple dyes, as is *Ochrolechia tartarea*. There are no colours attributed to *Parmelia omphalodes* or *P. saxatilis*, although *Xanthoria parietina* is noted as less common.

Linnaeus (Carl von Linné). (1759/60). *Plantae Tinctoriae*. See Jorlin 1759.

Rosenberg, Dorte Margrete. (1752). *Dorte Margete Rosenberg's Farvebog (Dame Margaret Rosenberg's Colour Book)*. Facsimile edition: Sara Wold & Esther Nielsen (eds.) Jutland: Blåvandshuk Museum, 1984. The manuscript of this book was given to the museum by the daughter-in-law of the last owner of Hesselmed Manor in the south of Jutland. The manuscript contains 61 dye recipes collected by Dame Rosenberg, the owner's wife. Elsewhere in this thesis I have suggested that Nielsen's greater contribution is not as a writer of dye manuals (Nielsen 1972), but her role in bringing manuscripts such as this to a modern audience. Notable in this facsimile edition is a BWM dye recipe second only to Martin's 1695 'crottil' as the earliest I have found in European literature. More remarkable still is that Dame Margrete's lichen dye recipe is sufficiently complete for the species in question to be identified as *Peltigera canina* [see also Fischer 1720]. This rare source provides valuable evidence of under-recorded BWM dyes with what is here a Danish provenance.

Rutty, John. (1772). "Indigenous Vegetable Useful in Dying and Painting." An extract from *An Essay Towards a Natural History of the County of Dublin* by John Rutty, M.D. David J. Hill (ed). Department for Continuing Education, University of Bristol, 1990. Rutty was an Irish physician and naturalist to whom natural dyes were a form of economic botany. These recipes provide a glimpse of Ireland's flora before the days when large-scale peat harvesting had affected lichen habitats described in Richardson 1991. Among the lichens described here in Rutty's own words are "*Cladonia* not *pyxidata*" which Hill interprets as "probably [a] crottle" (p. 165). Hill identifies a second BWM species as *Lobaria pulmonaria*. Far more useful than the recipes here are the ecological and cultural commentary Rutty provides in regard to AM dyes, including a significant reference to Canary Island *Rocella* which according to Rutty is "brought" to Dublin and "prepared by our dyers" (KDC emphasis; p. 139). Apparently other lichens are also imported from Wales. The reference in this regard is to 'muscorum' (a lichen that may be *Diploschistes*: see my discussion on this point in Casselman 1996c) which when obtained from Wales according to Rutty is "preferred to ours" (p. 139). Rutty claims that Irish 'corker' (e.g. *Ochrolechia* spp.) is "prepared by our country people by steeping in stale urine and adding a little salt" (p. 139) In Kerry Rutty says this cork is made into balls with lime

added to improve the consistency. A similar Shetland process is described by Edmondston. Significant also is Rutty's mention of *Ochrolechia parella*, the efficacy of which is hotly debated in the literature where Grierson's view does not mesh with that of Dallon 1997. But it is precisely because Rutty notes the industry in Auvergne that Dallon's narrative is all the more convincing. This may be a case where the considerable variation in lichen substances is a factor (see Culberson 1969, Narui et al 1996). The minutiae in Rutty makes it a useful work from a period when few sources include botanical, cultural and economic details.

* Svabo, J. Christian. (1782). "Indberetninger fra en Reise i Færoe 1781-2." ("A Winter Spent on the Færoe Islands.") *Kildeskrifter og Studier*. Copenhagen: Djurhuus, 1959. Bærentsen 1987, Clark 1982 and Grierson 1986 are among those who cite this account from which stems the 'stranded fisherman' scenario of how dye technology is transferred; fishers (and/or soldiers) as the agents of technology dissemination are discussed in Bærentsen 1987/1994 and Walton 1993. Although Svabo cites a korkje trade, he claims the dye was unknown to the Færoese before the 16th century, an opinion that Bærentsen 1994 disputes.

Watson, William. (1757). "An historical memorial concerning a genus of plants called Lichen... tending principally to illustrate their several uses." *The Royal Society of London Philosophical Transactions*. Vol. 50 (1757-1758). New York: Kraus Reprints, 1965, p.652-683. Like Rutty and Westring, Watson was another 18th century physician intrigued with lichens. In this paper Watson launches into testimonials as to their efficacy as cures which are curiously intertwined with dye references. Watson's ample asides leave the reader with more questions than answers. There is no question that *Lobaria pulmonaria* is effective as a medicine and a dye. But the claim that the "scarlet heads" of "pyxidatus" (*Cladonia pyxidata*) yield a purple dye "with lye" is incompletely cited; Watson mentions in this regard a "Dr. Lister" in, apparently, "Vol. 13 of the *Transactions*" (p. 678. No date is provided, nor could the reference be found.) How reliable is this lengthy paper in which Watson reports on Linnaeus' references to BWM dyes of England, Scotland and Wales? (Even Blunt and Stern, his biographers, tackle the issue of the Swedish naturalist's penchant for embellishment and 'geographical modification'). A comparison of this lengthy paper with the brief but more useful contribution by Ellis 1769 indicates how wide-ranging are the sources from this developing period in the botanical sciences.

* **Westring, Johan P.** (1791). "Experiments on the dyeing properties of Scandinavian lichens." *Transactions of the Stockholm Academy*, Vol. 12, 1791, p. 113-138. This article is cited by Kok. I interpret it as the original English version of Westring 1792.]

Westring, Johan P. (1792). "Essais sur la propriété tinctoriale de plusieurs espèces de Lichens, qui croissent naturellement en Suède, & sur les couleurs qu'il communique aux lainages & à la foie; par M. Westring, D.M." (Essays on the tinctorial properties of some species of lichens, which occur naturally in Sweden, and the colours that are communicated on wool and silk, by Mr. Westring, Medical Doctor.) *Annales Chimie*, Vol. 15, 1792, p. 267-297. Few sources included in this thesis make mention of Westring's 1791 and/or 1792 articles. Citations in Kok 1966, Llano 1944/51, Smith 1921(compare Jorlin 1749) and Tievant 1979 show a conspicuous lack of consistency. One obstacle to a successful search in this regard is a late 18th century stylistic quirk, the use of 'M' (Monsieur/Mr) in lieu of the Christian name. Llano 1944 inserts the correct initials, "J.P." but Tievant 1979 does not. The significance of this and the 1791 English article is evidence of Linnaeus' influence on his students, of whom Westring was one. This article identifies the role of lichens in medicine and art, a topic the author expands upon to a considerable degree in Westring 1805. Included here are 60% of the lichen species described in Westring 1805, described in this case in somewhat less detail and minus the exquisite botanical illustrations that characterize the later work.

Willemet, R., D.M. Amoureux and G.F. Hoffmann. (1787). "Mémoires, couronnés en l'année 1786, par l'Académie des Sciences, Belles-Lettres et Arts de Lyon, sur l'utilité des lichens, dans la médecine et dans les arts." ("Achievements of the year 1786 by the Lyon Academy of Arts and Sciences on the uses of lichens in medicine and the arts." Lyon: Chez Pierre et Delamollière. [See Hoffmann 1787]. Advertisements and promotions comprise the first four pages of this text which is one means by which to distinguish it from Hoffmann 1787. Hoffmann's collaboration in this effort that also involves his chemistry professor (Willemet), and Amoureux fils (all of whom are described in relation to this particular publication in Kok 1966) may be identical to the material in the 'missing' thesis, but it is recognized here and in Llano 1951 as a distinct and separate publication. Given the lack of availability of Hoffmann 1787, there has been no opportunity to compare this French text with the original Latin thesis.

Hoffmann begins with an exhaustive review of the literature, citing Gaius Plinius Secundus and Rosetti. The main body of the Hoffmann contribution here includes a description of lichen dye use "by the peasantry" throughout northern Europe. There are references here to *Lobaria pulmonaria*, *Ochrolechia*, *Parmelia* and *Umbilicaria*. But what makes the original Latin thesis special, according to Llano 1951, is missing here: samples of lichen dyed fibres which verify the methods used. Amoreaux was a Montpellier physician, and his contribution reflects the scientific interest in medicinal uses of lichens. Willemet's portion of the text, "Lichenographie Economique", is considerably longer than the other two; it is focused primarily on industrial pigments such as litmus and orchil, their manufacture and sources of supply.

1800-1850

Bancroft, Edward. (1813). *Experimental Researches Concerning the Philosophy of Colours; and the Best Means of Producing Them*. London: Cadell & Davies. Edelstein [in Schetky 1964] mentions many other editions. The 1813 imprint I read is at the University of New Brunswick, Fredericton. 'Tinker, soldier, sailor, spy' might well describe some of the epithets used to describe the medical doctor-naturalist-politician-entrepreneur who wrote the most quoted dye book of his century. (Brunello includes additional occupations for Bancroft, including 'spy'). Bancroft discovered black oak on a journey to America in the late 1700s and his fortune derived from an exclusive British import license for the yellow dye derived from *Quercus nigra*. This was a period of great opportunity for exclusivity in regard to profits derived from botanicals. Horticultural oddities, novel foodstuff and exotic new dyes were in great demand. There are several noteworthy aspects of Bancroft's work relative to the subject of this thesis. These are cudbear; the use of ammonia; the odour of AM dyes; and Kalm's Pennsylvania 'red'. In regard to cudbear, Bancroft states that he has "never seen Dr. Gordon's specification of his invention," (p. 300) and claims to have no information on "the peculiar novelty by which it was distinguished" (*Ibid*; see also Gordon 1786). He speculates that the success of cudbear is due to the use of ammonia distilled from urine, rather than urine, *per se*. The observation that concentrated ammonia was the key, suggests otherwise. How could

someone of Bancroft's experience as a dye entrepreneur and manufacture not know the secret of the Gordon product? Also relevant here is Bancroft's opinion that faecal contamination spoils the dye. His description is persuasive and evocative: "...[it] lately occurred to me, in consequence of an application from certain [London] manufacturers of cudbear...who complained that they were unable to obtain...the usual price;...and being unable to discover the cause of its *manifest inferiority*, they requested my assistance to remove its defects." (KDC emphasis; p. 301. See also Forrester 1975). In regard to the odour of orchil, Bancroft's tests were carried out using lichens of the same type apparently supplied to him in two different forms, one presumably unprocessed, and the other perhaps already macerated. Once his experiments were underway, Bancroft claims the odour was "extremely offensive." (p. 301). The source of the problem, he states succinctly, is "...solid human faeces." (*Ibid.*) I discuss the specific detail in Berthollet & Berthollet 1824, but I myself support Bancroft's opinion. And finally, there is the issue of 'Hoffmann's muscorum', the lichen Bancroft claims that "Kalm says the Pennsylvanians macerate three months in urine, and then dye a beautiful red colour" (p. 299; see Berthollet 1823, Gerber 1977, Stenhouse 1845). Bolton and numerous others have misinterpreted this reference; and I may have myself done likewise (Casselman 1996c). We may not have considered in our interpretation of the Kalm reference umbilicate species such as *Lasallia pensylvanica* which I discuss in Berthollet (below).

Bemiss, Elijah. (1806). *The Dyer's Companion With a New Introduction by Rita J. Adrosko*. New York: Dover Publications Inc., 1973. Adrosko's scholarship involves the reinterpretation of historic dye manuals such as this one, Bronson 1817, and Pomet 1694 (a portion of which is included in her 1971 book). Lichen dyes are confined here to a very confusing reference on page 227 which may have caused Adrosko considerable difficulty. Bemiss describes "perilla, the archil of the Canaries" as a dye which with "other mosses" can ruin madder. Given the abundance of evidence to the contrary in sources such as *The Plictho* and Jaggard 1705, this detail limits the use of Bemiss to our analysis for it only reinforces his opinion of madder and cochineal as the only reds of value.

Berthollet, Claude-Louis and Amedee Berthollet. (1824). *Elements of the Art of Dyeing*. 2nd. edition of 1791 original; 2 volumes. Andrew Ure (ed). London: Simpkin & Marshall. [See also Ure 1858]. For an exhaustive list of imprints relative to the complex publishing history

of this book, see Sidney Edelstein's article in Schetky 1964. Distinguishable in this version of the second edition are two references in Chapter VIII ("Of Archil") which are among the most troublesome lichen dye citations in my research. One problem is the repeated reference to orchil as having "the odour of violets" (p. 184), a description that provides a startling contrast to Bancroft's. The second area of troublesome text also involves Kalm, and Bancroft indirectly. The Berthollets cite Kalm's reference to Swedish umbilicate lichens for dyeing red (p. 184), which I can verify. I have noted areas in Sweden where *Lasallia pustulata* is extremely prolific, so it is not a question of veracity in regard to the species involved. "Kalm says in an Appendix to a Memoir of Linnaeus in the Stockholm Transactions for 1745," the Berthollets write, "that in some parts of Sweden, two lichens (*Lasallia* and/or *Umbilicaria*) are used for dyeing red." (KDC insertion; p. 184). If this text is also in the 1791 original edition of Berthollet then it is contemporaneous with Westring and could have been borrowed from that source. Or is this reference attributable to Ure, the editor? Like other physicians-cum-botanists, Ure was widely well-read. It is interesting to speculate here on the name of *Lasallia pensylvanica* which is so often misspelled, and wonder if there is another possible clue in that regard? In regard to the 'odour' of orchil, it is my firm belief that somewhere along the misinformation highway an odoriferous error occurred. In twenty years of dyeing I can verify that one thing AM dye maceration is not, is pleasant-smelling, although it is not quite so bad as murex. What I suspect is this: the "colour of violets" (a perfect description of some AM dye shades) was at some point misinterpreted or written incorrectly as 'odour'. This is precisely what happened in regard to Llano's 'misty' brown (1951, p. 411) which should read 'rusty' brown. [See also 'musky/musty' in Sharnoff & Sharnoff 1997.]

Bronson, J. and R. Bronson. (1817). *Early American Weaving and Dyeing: The Domestic Manufacturer's Assistant and Family Directory in the Arts of Weaving and Dyeing, with a new Introduction by Rita J. Adrosko*. New York: Dover Publications, Inc., 1977. Adrosko claims that little is known about the authors of this book first published in Utica. She does not speculate on "J's" first name but suggests that "R" is Russell Bronson, who had the dye section published independently in 1826. There is nothing in Bronson relative to the subject of this thesis other than a reference to the adulteration of red dyes with fraudulent products, a practice also noted in Grieve 1934. AM dyes are conspicuous by their absence here. One wonders why? [See Bemiss 1806, Cooper 1815].

Cooper, Thomas. (1815). *A Practical Treatise on Dyeing and Callico Printing*. Philadelphia: Dobson. "At present," writes Cooper, "the English manufacture cheaper, dye cheaper, and finish their goods far superior to every other nation as well as our own" (p. vi). Cooper continues: "But if our cloth and our colours... are substantially better...it will compensate for...higher price. My receipts therefore," Cooper assures the reader, "are not of the cheapest kind. I have uniformly rejected the fraudulent and fugitive dyes..." (*Ibid.*) Having said that and also noted Bancroft as a suitable supplement to his own manual, Cooper includes 'orseille' (p. 216) to dye "the most brilliant violet on silk," a colour he claims that logwood cannot provide. His opinion is interesting in view of the fact that Bemiss rejects orchil outright, as a product of inferior quality. Brunello 1973 describes Cooper as a consummate chemist; and has high praise for the American's philosophy of "verity" in dyeing, "on which," writes Brunello, "more than one technician should stop and meditate" (Brunello 1973, p. 266).

Edmondston, Thomas Jr. (1844). "On the native dyes of the Shetland Islands." *Transactions of the Botanical Society* (Edinburgh), Vol. 1, Section November 1840- July 1841, p. 123-126. [See Lindsay 1868b, Duncan 1961, Simmons 1985]. What Edmondston contributes here allows us a cross-reference of Shetland data with Lindsay's Hebridean study (1868b). Like Lindsay, Edmonston mentions *Parmelia saxatilis*, but he also notes that for any such dye to contain "a particle" of either *Cladonia rangiferina* or *Peltigera canina*, "it is supposed to be spoilt." This is inconsistent with evidence in this thesis that shows *P. canina* to be one of the earliest European BWM recipes encountered to date (Rosenberg 1752). It is a prime example of the confusion in the subject of lichen dyeing. We could discount Edmondston's mention if it were not for the next sentence he writes: "How far this statement may be correct I have no means of ascertaining; but it is a universally received opinion." (p. 124) Edmonston's qualification is exemplary, but there are more problems. In regard to *C. pyxidata*, this lichen is interpreted by Kok 1966 as one of three ingredients in cudbear; and while I do not agree with that interpretation, her view is in direct conflict with Edmonston whom she cites. Inconsistency in interpretation plagues the literature and it casts doubt on otherwise reliable sources, for more so than Lindsay, Edmonston's documentation of AM dyes goes beyond bare description, to observation. It has a ring of truth. The value here includes a methodological description of the AM process for cudbear, or what the author refers to as korkalett' (p. 125), but if we compare

this information to Lindsay 1868b, it is clear that one source conflicts with the veracity of the other, casting doubt on both. What explains the discrepancy? Few contributors to the subject of lichen dyes are more mysterious than this youthful Shetland botanist whose name has the distinction of being misspelled by historians and experts such as Ponting 1980; and Lindsay, who in 1856 spells it as "Edmonston" (p. 93); and 1868b as "Edmoustone". Described here as a resident of "Balta Sound, Shetland," Edmondston was widely known as a precocious youth of unusual talents. If, as Duncan claims, Edmondston actually did write a *Flora of Shetland*, then it is odd that no such book can be located today. That there is archival of material related to Edmonston's work at the Lerwick museum is not the issue, although I was denied permission to see it. What I do question is whether or not such this work was ever published as a 'book' (compare Westring 1805-9). In the opinion of a relative, David Edmondston, whose great-grandfather was a brother to Thomas Edmondston, there are a number of issues not only in regard to Duncan's information, but also to the question of whether or not Thomas was (as Duncan describes him) a physician. David Edmonston was pilot of the plane on which I travelled to Fair Isle (August 1992); in our conversations during and after he mentioned "some controversy over examinations". David Edmonston did give me a copy of a letter from one J. B. Anderson in which the writer describes how Thomas Edmondston's body (felled by a gunshot wound, in a "foreign clime") was "was gently laid on the lower deck as the evening softly fell." This tragic end to what is interpreted by some as a brilliant career and to others, such as the pilot, as "a predilection for unsavory companions", may be one reason for the confusion in regard to this man, his work and his life. Thomas Edmondston is not the only individual who assumes mythical proportions in regard to the subject of lichen dyes; a 20th century Hebridean dyer is likewise noted in my essay.

Haigh, James. (1813). *The Dyer's Assistant in the Art of Dyeing Wool and Woollen Goods*. Poughkeepsie, NY: Paraclete Potter. Many dye manuals in post-colonial America were books comprised of substantial extracts from earlier French works such as Hellot. A perfect example of this genre is Haigh, who acknowledges 'borrowing' from Hellot, to which he claims to have made "additions and practical experiments" that flesh out this text. Cooper is of the opinion that this book is merely a rehash of Hellot but I find the brief orchil chapter far superior to Hellot himself as a description of the AM dye processes.

Logan, James. (1833). *The Scottish Gael, or Celtic Manners as Preserved Among the Highlanders*. First American edition, Boston: Marsh, Capen & Lyon, 1833. Facsimile of original edition: Edinburgh: John Donald, 1976. [See also Adam 1934]. Logan cites the reference from the 1776 *Scots' Magazine* in regard to Gordon's efforts to prove the value of his indigenous dye. Logan cites figures that indicate the lichen harvest circa 1808 had a total value of "from £400-£500" in Aberdeen and Banffshire alone. But his pejorative opinion of cudbear as a commercial product, surfaces with this cryptic comment that "Mr. Gordon did not arrive at so much perfection in fixing the colour as many of his own countrywomen." [p. 238].

Molony, Cornelius. (1837). *Molony's Masterpiece of Wool, Silk and Cotton Dyeing, Containing the Best Recipes Without the Least Reserve*. Lowell, MA: Dearborn & Bellows. Molony's title is justifiable; the recipes are written in a direct style that is easy to follow and full of practical advice. They are, however, aimed at the professional dyer, and amounts are given accordingly ("boil a kettle containing 200 gallons...", p. 45). Remarkable here is the inclusion of cudbear, a dye rarely encountered in American sources of this period; and Moloney's spelling of "cudbierd" makes for an interesting comparison to spellings in Cooper 1815, Hills 1857 and Rambo Walker 1840. There is no hint in Molony or the other sources cited that cudbear is anything but an imported product; the value here is further evidence that cudbear is culturally and commercially distinguishable from orchil circa 1837, a claim contrary to opinions in Llano 1951 and Kok 1966.

Partridge, William. (1823). *A Practical Treatise on Dying of Woollen, Cotton, and Skein Silk with the Manufacture of Broadcloth and Cassimere Including the Most Improved Methods in the West of England*. 1973 facsimile edition; technical notes by K.G. Ponting. Edington, Wiltshire: Pasold Research Fund. [See also Ponting 1980; Edelstein & Borghetty 1969]. This valuable reference contains what is arguably the most perceptive statement made in the past two hundred years as to the nature of the historiography of lichen dyeing. Ponting claims that the confusion is due to a lack of distinction in regard to dye names, and cites as evidence the fact that "...the difference between cudbear and archil has never been satisfactorily defined" (technical note # 189, p. 254). Why has the significance of this opinion not been analyzed before, or discussed within the context of a comparison of historical and modern

sources? My view that agreement on vernacular names is a primary obstacle to an analysis of the cultural value of lichen dyes is addressed in my essay (p. 12).

Rambo Walker, Sandra. (1840). *Country Cloth to Coverlets: Textile Traditions in 19th Century Central Pennsylvania*. Lewisburg, Pa: Union County Historical Society Oral Traditions Project, 1981. Rambo Walker cites William Lowmiller's 1840 dye recipe book where 'cud bear' as spelled in the original source confirms the availability of the commercial product in northeastern North America. This reference sheds important light on the nature of cudbear as an imported product, one commercially and culturally distinguishable from orchil.

Rees, Abraham. (1819) *The Cyclopaedia; or a New Universal Dictionary of Arts, Sciences and Literature*. Longman, Hurst, Rees, Orme & Brown. [See also Chambers 1778]. The value of the 'archil' section in this reference is the lengthy and fairly accurate description of *Roccella* manufacture and the lichen harvest. *Roccella* is correctly spelled here, as it is in numerous other 19th century British sources, a point missed by recent scholars such as Robinson 1969 and Taylor 1990. Veracity is an issue when Rees perpetuates the fiction that AM dyes were unknown in the ancient world. The juxtaposition of accuracy with inconsistency makes this a work of similar value to Chambers 1778, although in this case pagination is an asset.

* **Robiquet, M.** (1830). "Essai analytique des lichens de l'orseille (Essay on the analysis of orseille lichens). *Annales Scientifiques de l'Auvergne*. (n/Vol.) p. 337-341. According to Cooksey 1997, this paper describes methods of harvesting orchil lichens and the first successful experiment whereby 'orcine' was isolated and recognized as a chemical compound derived from certain species.

Smith, Titus. (1835). "Natural history of Nova Scotia: conclusion on the results of the study of the vegetation...". *Magazine of Natural History*. London, Vol. 8 (56), p. 641-662. There are no lichen dye mentions in this paper, but it is included here as important and rare evidence of aboriginal use of dye-making species for non-tinctorial purposes. Included in Smith's description of Nova Scotia lichens are *Baeomyces* and *Cetraria* spp. which Smith notes as conspicuous landscape features. Of great interest to me is his reference to *Umbilicaria* spp.

used "instead of barley in their soups" (p. 655), a need confirmed by Jerry Lone Cloud (Piers Accession Books, Nova Scotia Museum Archives, # 5161, October 1922). This same genus is also a source of food in Norway according to Høag 1976. In *The Gorsebrook Papers* I note the use of umbilicate lichens in Japan today as both a ceremonial food and for craft dyeing (Teramura 1984/1992).

Stenhouse, John. (1848). "Examination of the proximate principles of some of the lichens." *Philosophical Transactions of the Royal Society of London for the year 1848*. Section 1: p. 63-89. This comprehensive paper appears to be one of several contributions made by this Glasgow chemist who reoffered his research as did Lindsay for subsequent republication in a revised form; Kok includes Stenhouse 1848 by the title, "On the colourific principles of orchil". This paper discusses the tinctorial potential of different species of *Roccella*. The author begins with a particularly large specimen of *Roccella tinctoria*, some eight to ten inches in length, "which had been rejected by the London archil manufacturers as unfit...from the small quantity of colouring matter it yielded when subjected to the usual process." [See Lindsay 1868b for a discussion of the extent to which *R. tinctoria* was used for *commercial* dyeing.] Subsequently, Stenhouse experiments with different species such as *R. montagnei* from Angola to determine if some contain more dye substances than others, and to compare his findings with indigenous *Ochrolechia tartarea*. He tries South American specimens of *R. tinctoria* from Peru, moves on to *R. tinctoria* from Africa, and *R. montagnei* (and/or *R. fuciformis*) from Portuguese Angola. Stenhouse describes a laboratory method of precipitating both an 'alpha' and a 'beta' orcellic acid, plus a chemical compound he calls "roccellinin." The latter is evidence that Stenhouse had distinguished the chemical substances now known as roccellic acid (Culberson 1969). He identifies the percentage of tinctorial substances available in "the richest of the lichens employed by the archil manufacturers" (i.e. 12% in Angolan *Roccella*,) and compares it to the 2% available in *Ochrolechia tartarea*. On the basis of these figures and the British reliance on imported dyestuffs, Stenhouse departs significantly from Lindsay's appeal to use native lichens; a competitor of Lindsay, Stenhouse claims "it would be... advantageous to extract the colouring matter in the countries where the lichens grow...and the expense of their transport might...be saved." (p. 78) Among his conclusions in chemical terms are these: "...so far as we know, orcin is always one of the products when any of the colouring principles of

the lichens which yield red dyes with ammonia are subjected to particular operations. When the colouring principles...are distilled..or boiled with alkalis, or pure water or alcohol, orcin is always one, though by no means the only product." He is entirely correct. Many dyers have tried lichens such as *Evernia prunastri* and *Usnea barbata* as AM dyes, most recently Julia Watson (see Earle 1898). Others who have met with success include Grierson 1986 and Windt 1970. That all of these sources use material from different locations confirms what Stenhouse and Culberson 1969 note; geographic variation in percentages of substances present affects not the *Roccellae*, but also most other genera.

* **Stenhouse, John.** (1867). "Notes on some varieties of orchella weed and products obtained from them." *Chemical Society Journal*, Vol. 5, p. 221-227. [We were unable to locate this item but there is likely some overlap in subject matter with the 1848 paper.]

Westring, Johan P. (1805-1809). *Svenska Lafvarnas Färghistoria*. Stockholm: Carl Delén. [See Westring 1792-1794; see also Lindsay 1856]. Kok and Sandberg are the only sources in this thesis to have understood the origin of this book which is in reality a collection of pamphlets published between 1805 and 1809. I asked Llano if his own copy indicated that Westring 1805 was actually a compilation, a series of publications; and his doubt led me in 1990 to examine a copy at the National Agricultural Library. I have also seen the Farlow Reference Library copy at Harvard; and two copies in Sandberg's personal library. [Another Swedish copy I have not seen is owned by R. Moberg, Uppsala, who apparently also has access to what is one of only two known sets of Lindsay's dye samples - the "missing" material I refer to in my discussion of Lindsay 1854.] Each copy of Westring 1805 I have seen is slightly different. There is no index in my own copy. As Sandberg and I leafed through his two books in 1992, it was apparent that neither of his copies was exactly the same. One contains no preface, and the other, a preface different from the one in my book. Also missing from my book is the section published in 1808, one that includes "*Sticta pulmonacea*," the lichen *Lobaria pulmonaria*. The non-sequential pagination of the pamphlets is little help in establishing chronology, and yet these discrepancies are no obstacle to understanding the text (Acknowledgements). Westring uses the preface in typical fashion to impugn other dye manuals of the period, without naming them, a common tone in early instructional manuals. He makes

it clear that his methods and procedures are superior to all others; that his techniques produce not only the most fashionable colours, but those that will endure; and he points out the benefits of Swedish enterprise in this regard which is not dissimilar from Lindsay's vision of lichen dyes as rural outreach. A water colour painting of each lichen tested for dyeing is accompanied by elongated rectangles of colour that indicate the variation available from each species described; and as Llano 1951 notes, these beautiful botanical illustrations are what distinguishes 18th and 19th century treatises such as Hoffmann 1787 and Lindsay 1856. (The Westring illustration of "tuschlav," *Lasallia pustulata*, was featured as the cover of *The Maine Naturalist*: see Casselman 1994 b, c). Westring begins each dye recipe with a complete morphological description of the lichen, followed by a general indication of habitat. His methods indicate that some dye lichens are ground to a powder, while others are shredded. Among these procedural descriptions it is impossible to separate methodology from observations. These include Westring's opinion as to whether silk dyes faster with the species in question than does wool; statements regarding alcohol, beer, cream of tartar, lye, salt, sulphuric acid and vinegar as they may or may not affect a colour change; commentary in regard to cold versus heated dye baths (he appears to sanction both, and use the former more with silk than with wool); and broad hints as to the economic benefits of dyeing to the rural poor who would prosper, in his opinion, if they were to harvest dye lichens for export to Holland and Germany. The export of dye lichens to countries other than Scotland is very rarely encountered in literature of this period. This is economic data of significance. Also important are the descriptions of colour names which provide an etymological insight into fashion preferences in Sweden circa 1800: AM dye names include 'carmaline', 'brick violet', 'musk', 'plum', 'puce' and 'dark sea green'. Green is a colour very difficult to obtain from lichens; Hoad's green from *Hypogymnia physodes*, with a mordant, is a case in point. I have verified her test. But Westring's green involves *Parmelia omphalodes*. The cloth is first dyed according to standard BWM methodology, then subsequently soaked in "bluestone", the same copper sulphate used by Hoad. I doubt the results Westring cites and suspect we missed in translation something he used as a second additive. Westring's "Lichen pseudocorallinus" (*Pertusaria corallina*) is described as having "the most colouring matter of any lichen". He says it will dye 4 to 8 times its own weight of silk in "only one hour," but is vague in regard to precisely how this is done. Westring admits that while other dyers claim you cannot use lichen dyes on cotton, which

Hellot maintains to be the case, his own yellow dye based on "Candelarius" (*Candellaria* spp.) is proof to the contrary. There are hints in this book on how to make ink, and references to Linnaeus in that regard which are amusing in light of my annotation of Jorlin 1759 and Watson 1757. A protégé of Linnaeus, Westring comments that he once heard his illustrious mentor say that *L. pustulata* "can be used to make ink", but, he continues, "I have never seen anyone *do* it." (KDC emphasis; this scepticism is similar to mine when I confront the 'is said to yield' school of dye mythology.) In regard to the use of umbilicate lichens for food, Westring says the abundance of *L. pustulata* makes it suitable to eat when other products are in short supply. The "jelly" soup he claims is made by the "poor people" sounds much like the Mi'-kmaq preparation documented by Titus Smith in 1835. Culberson in her 1969 Appendix gives Westring's dates as 1753 to 1833; this is significant for it means that his earlier work on lichen dyes was not as in the case of Edmondston 1844 and Hoffmann 1787, done at a youthful age but perhaps as more mature work as an adjunct to medicine. I also speculate that Westring, who was physician to the Royal Court of Sweden, used lichens as a means to bring botany and chemistry to the children of the court whose science education may have been one of his general responsibilities. The ultimate value of this exceptional collection of dye recipes, ethnic insights, and lichenological lore is that it provides a broad cultural context for lichens - one that goes beyond tinctorial applications to include the folklore and superstition relevant to lichens on skulls; the role of lichens in animal husbandry; and hygiene applications (Westring, the consummate retainer, may be a populist in recording folk remedies but he barely *hints* at what these might be: see the menstrual tea made from *Xanthoria parietina* in Casselman 2000a.) As noted in my essay, a greater recognition of lichens as a useful tool in interdisciplinary historical analysis can be derived from such studies at this one which is of incomparable value. Westring is just such a source. We can only speculate on the value of Hoffmann 1787 in this regard.

1851-1899

Crookes, William. (1874). *A Practical Handbook of Dyeing and Calico Printing, with Eleven Page-Plates, Forty-Seven Specimens of Dyed and Printed Fabrics, and Thirty-Eight Woodcuts*. London: Longmans, Green & Co. This book is distinguished by a lengthy section

on lichen pigments and dyes (p. 367-383) that is more comprehensive and cogent than any other source of the period. Simplicity of language and breadth of context are among its strengths, evidence of which include the subtle but important differentiation Crookes makes between orchil 'discovered' by Federigo and what is interpreted here as Federigo's 'discovery' of not the dye (p. 367) so much as of the economic potential of the dye. I agree with Crookes' distinction, and suggest in Casselman 2000d that this awareness of profit was what motivated Federigo to use orchil as a means to recover costs when he returned to Florence after the expensive crusade which took him to the Levant (compare Hofenk de Graaff 1969; Smith 1921). Crookes describes the morphology and habitat of several species of *Rocella* (p. 367) and notes orchil lichens imported to London from Africa, Peru, Spain, Corsica, Sardinia and the Greek Islands. Crookes' description of commercial orchil production is unsurpassed, particularly the ratio of lichen to urine used (100 kilos of lichen require 240 litres of human urine). As discussed in my essay, in spite of these figures we do not know precisely how these figures relate to the fibre ratio. This mystery is what qualifies my interpretation of the essential difference between domestic and industrial lichen dyes. Also noted here is Bancroft's earlier observation on the improvement in orchil when ammonia is substituted for "the mixture of urine, lime and arsenic" (p. 368). Crookes also defines litmus within a methodological context (p. 381) as a product made from lichens but one that does not necessarily make a suitable dye, as noted (Pomet 1694). There is also a reference here to mordants within the context of Westring's research (p. 383) although Crookes does not specify the articles or the book.

Earle, Alice Morse. (1898). *Home Life in Colonial Days*. Facsimile edition. Stockbridge, Ma: The Berkshire Traveller Press, 1974. In modest books one occasionally finds information of considerable value. There is only one reference to lichen dyes in Chapter IX (Wool Culture and Spinning), but because we still know so little about Acadian dyeing, it is extremely significant as part of the slow-to-emerge and understudied picture of Francophone praxis in isolated regions of North America (Chiasson 1972, LaBelle 1995). In Earle's exact words the Acadian weavers of Pinehurst, North Carolina use "a moss which they find growing on the rocks...which may be the lichen *Rocella tinctoria*, or dyer's moss" (p. 251). According to my interpretation, this statement is made within the context of Earle's considerable knowledge of weaving patterns, many of which are described on p. 250. Also noted in this regard are the

nuances of Acadian domestic textile production. For example, Earle mentions the "drugget", a unique ethnic textile which is characteristic of primarily Acadian households according to Burnham & Burnham 1972. Earle's statement supports the use of AM lichen dyes in Francophone regions of the south which is a link to the tradition in Canada (Beriau 1933, Soeurs 1941). This reference is extremely significant. A clue to veracity is the correct Latin name and spelling of *Roccella* which indicates Earle 'did her homework' (That she spells it correctly in the American south in 1898 and modern UK scholars do not, is truly a cultural disparity worthy of comment.) Earle is incorrect in her identification of the lichen but this is unimportant *per se*. We can rule out commercial cudbear and/or orchil as Earle claims the Pinehurst dyers "find" their lichens. According to Gerber (the chemist and consummate 'experimenter'), there are numerous saxicolous southern lichens that contain gyrophoric, lecanoric and other acids appropriate for AM processing. Is Earle's lichen *Parmotrema tinctorum*? This is a popular AM dye lichen (Gerber showed me his red/purple samples November 4, 1994). According to Hale 1979, *P. tinctorum* is "very common on trees and rocks", and "frequently collected" in the southern United States" (p.66).

***Encyclopedia Britannica*. (1878). *A Dictionary of Arts, Sciences and General Literature*. Ninth Edition, Vol. 2, "Lichens" (p. 559) and "Archil" (p. 379). Edinburgh: Adam & Charles Black. Notable in both sections is the contradictory quality of the information on dyeing. For example, "cudbear" is described as "formerly made in Scotland" (p. 379; see Rambo Walker 1840, Molony 1835, Hills 1857). But is this reference to a domestic or a commercial product? Typically, the Britannica account contributes nothing to a clearer name distinction of the kind that Ponting notes as necessary (Partridge 1823). This version of the narrative is as confusing as earlier accounts such as Chambers 1778 and Rees 1819 [compare Edge 1914].**

Ganong, William F. (1889). *The Economic Mollusca of Acadia*. St. John, NB: Barnes & Co. The inevitable and inextricable link between AM dyes and mollusc purples is a relevant discussion point in dye historiography, and not only in regard to the Mediterranean murex, or Irish murex (Hoad 1987, Mitchell 1978). But the second-hand reference to murex as a laundry ink in Ganong's account is useful on four counts. We can compare it to Plinius Secundus 77

where there is the claim that murex ink can be made by "anyone" (see also Westring 1805). Ganong provides a northeastern frame of reference for the interpretation of unknown purples in aboriginal quillwork (a possibility discussed in Ruth Homes Whitehead's *MicMac Quillwork*, Halifax, The Nova Scotia Museum, 1982). The Ganong account also identifies two North Atlantic molluscs as capable of producing murex: *Buccinum undatum* and *Thais lapillus*. Also valuable in the Ganong study is the anatomically correct location for the hypobranchial gland (see my discussion in regard to this point in Barber 1991). While Ganong notes it makes little economic sense to use northern molluscs for large-scale dyeing, there is considerable cultural value in small scale experimentation (Casselmann 2000a). On a final gender note, Ganong's association of murex as a laundry marking for domestic 'linen' (p. 40) is not valid within a textile context for flax is perhaps the most difficult of all fibres to dye (S. Kadolph, pers. com. Steuben, Me., September 2, 1999). Kadolph notes that what Ganong likely means here is 'household *linens*', a distinction lost on a 'gentleman' observer.

Gardner, Walter M. (1896). *Wool Dyeing: Part II. Posselt's Textile Library*, Volume III. Philadelphia: E.A. Posselt. [See also Rawson, Gardner & Laycock 1918.] This is one of the least known and under-valued sources of this period. Noted here is the link between murex and orchil: "From an early date...other dyestuffs were used in conjunction with the shell-fish purple with the two-fold object of modifying and cheapening the colour." (KDC emphasis; p. 38). "In this connection we find the first mention of orchil [as] the *Fucus marinus* referred to by Pliny..." (*Ibid.*) Gardner has grasped precisely what the fraudulent recipes in the *Papyrus Holmiensis* are designed to do; employ a cheaper dye to augment the other. Gardner's next statement is further evidence of the controversy and confusion that characterize orchil and murex. Gardner claims on page 38 that "all knowledge of...Tyrian purple appears to have been entirely lost...throughout the Middle Ages..." (*Ibid.*). But centuries of confusion as to which purple was meant in this regard have obscured the fact that murex did *apparently* decline as practice. Some have interpreted this 'loss' as affecting both technologies, murex and orchil; and alternatively, applied the 'loss' concept solely to orchil. Furthermore, Gardner is of the opinion that murex did not make a 17th century comeback because by then it was much cheaper to use orchil to achieve the same colour (p. 38). This explanation is plausible. Also noteworthy in Gardner's murex entry is the use of bird guano in calico printing, a product

that originates in Peru (*Ibid.*) A similar reference in Margaret S. Creighton's "American Mariners and the Rights and Manhood 1830-1870" (*Jack Tar in History*, C. Howell & P. Twomey, eds., Acadiensis Press 1991, p.143-163), describes a vessel employed in the bird guano trade to Peru" (*Ibid.*, p. 143). Creighton and Gardner's statements are contradictory, but I speculate this may represent a reciprocal trade that also involved *Roccella*.

Great Exhibition Catalogue. (1851). Volume. 2. London: Spice Brothers. This catalogue provides evidence that one Donald MacDougall, a manufacturer from Inverness, submitted in Class 20 (# 83, p. 582), tartans and handwoven tweeds, and samples of lichens used for dyeing. Also included are "small quantities of yarn, showing...native dyes from crotal... and cudbear," the latter which are described in unappealing period language as "drab and brown." These are colour qualifiers that refute my experience and that of numerous other dyers (Casselman 1996c). Also exhibited are actual lichen specimens, unnamed as to genus and species. This might have been valuable documentation; instead it offers data of little use except to marginalize crottle and cudbear as cultural curiosities.

Hart, Henry Chichester. (1898). *Flora of the County Donegal*. Dublin: Sealy, Bryers & Walker. With the inclusion of this primary source the vernacular names for crottle are expanded to include 'crottell' (p. 371), a highly unusual version of the word. According to my research, the etymology here most closely resembles the Duchess of Sutherland's Scottish "crottal" (see MacLagan 1898, Ross 1896). It is also suspiciously like the spelling in Hale 1983. In the context of Mrs. Ernest Hart's securing of a Scottish dyer to teach skills in Ireland, noted in Hoad 1987, is it also possible that crottle is in some way linked to that initiative? We learn nothing of the sort here as Hart's references to lichen dyes are hopelessly flawed. The reason for this is not immediately apparent for he was a botanist, and one who would presumably have had access to historical materials comparable to those upon which Ruttie based his 1772 work. Most perplexing in this regard is the manner in which Hart links *Roccella* to crottle, which is a misappropriation of not only the methodology, but Irish dye historiography (O'Curry 1873). In the space of just a few lines of text, what is flawed becomes even more confusing when Hart describes crottle (and/or *Roccella*: one is uncertain which) as "...used to dye feathers and wool orange for tying flies in Ballyshannon and Belleck." (p. 371) The only value of what might

have been a unique cultural contribution is that Hart provides us with a link between Irish fly tying and lichen dyes within the specific context of sport and recreation to Roubal 1996.

Hills, Sister Mary Ann. (1857). *Mary Ann Hill's Receipt Book: Nineteenth Century Shaker Dye Recipes*. Facsimile edition. Brother Arnold and John Cutrone, eds. New Gloucester, Me: Red Wagon Press, 1997. Published by the Sabbath day Shaker community where Sister Mary Ann was deaconess, this valuable collection represents according to Brother Arnold "our summer's labour" which "produced 200 books" (Preface). The references to cudbear are neither lengthy nor detailed. What they do provide, however, is tangible evidence of cudbear as a commercially available product in New England. This record confirms other references such as Molony 1835 and Rambo Walker 1840. Until there is a comprehensive survey of AM lichen dyes in colonial and post-colonial North America, each and every record is significant to develop a profile of use. This book will help greatly in that regard.

Lindsay, William Lauder. (1851). "Exhibition Sample Book." [See Westring 1805]. The Royal Botanic Gardens, Edinburgh, houses these samples prepared for the 1851 Exhibition (see *Great Exhibition Catalogue* 1851) that comprise actual lichen specimens glued to herbarium sheets. Accompanying the specimens is a text in which Lindsay describes the Norwegian-British dye trade, and the manufacture of orchil by the London makers (see Lindsay 1868b). No one knows if the "sample book" illustrated in Grierson 1989 and the one illustrated in Moberg & Holmåsén 1990, are one and the same. I suspect they are two 'sets' of exhibition material which were subsequently bound into 'books'? (There may be more, unbound sets). My viewing of the RBG Lindsay material in May 1986 and September 1992 indicates there were a total of three boxes there: box 1 contained fabric swatches (including AM dye samples on leather, silk, wool, cotton); box 2 contained lichen specimens and notes on dyeing; and box 3 comprised illustrations of spores and technical data. Hoping to see the entire bound "set", I contacted Grierson, who in a telephone conversation acknowledged the copy loaned her by Dr. Frank Jones, University of Leeds, and what she thought was "a possible duplicate" at RBG (the aforementioned boxed sheets). My notes of this conversation with Grierson include her reference to the material as "probably priceless". Interestingly, Grierson also noted that the Lindsay material was brought to her attention by someone in the audience who approached

after she gave a dye lecture at EBG. ("Have you seen this?" was their comment). Albert Henderson says he saw the sample book several times circa 1992/4 when it was housed at Leeds University's Brotherton library where I subsequently wrote to request permission to arrange an official loan of the Lindsay material to the Nova Scotia Museum for research purposes. My request was denied due to "the special nature and value of the material in question". (Pers. com. S. Birkinshaw, 1994) In 1998 I again contacted Dr. Birkinshaw and made arrangements to view the Lindsay Exhibition sample book *in situ*, by which time it had gone missing. Dr. Birkinshaw's letter explains: "The last time I saw the book was in 1995/6 during my negotiation with colleagues from the Brotherton Library concerning the transfer of our special collection...to their(s)....". Ironically, Birkinshaw claims that he used the Lindsay material as an example of one of their more valuable items which a move to the Brotherton would protect (KDC emphasis; letter, May 19/98). Birkinshaw continues: "...all that we can conclude is that the book, which was very attractively bound and housed...in a protective case, was stolen...; whether the theft was perpetrated by one of the many persons who accessed our special collection over the past years, or during a burglary, we do not know." And so my analysis of the 1851 Lindsay material is based not on the entire collection of materials, but that portion I have seen at RBG. Among these notes are comments that demonstrate how Lindsay openly questions the dye results and tests by "authorities of celebrity", a group that includes European scientists such as the renowned German lichenologist, Nylander whom Lindsay credits with the doubtful opinion that the umbilicates contain "only a small amount of colourable material". But it is Stenhouse whom Lindsay impugns in a trenchant dispute over laboratory methods as he finds that "small scale experiments" in the lab cannot provide "qualitative or quantitative" data. Moreover, he argues that to test any particular species with a reagent is inconclusive; and that there is "a marked difference between colorimetric testings" and the suitability of specific lichens to the commercial dye trade. To some extent Lindsay is right; for example, *Xanthoria parietina* (tests K+ purple) makes a blue dye, and not the purple indicated by the test. Yet it is these same laboratory methods that Lindsay employs himself. Far more informative and less cantankerous are Lindsay's data in regard to the importation of umbilicate lichens from Norway, details which are included in his subsequent book.

Lindsay, William Lauder. (1854/55). "Experiments on the dyeing properties of lichens."

Edinburgh New Philosophical Journal, Vol. 42, p. 228-250. Self-described here as "assistant physician of Crichton Royal Institution, Dumfries, this paper by Lindsay is one of a number in a confusing chronology. In his own book Lindsay mentions papers presented to the Botanical Society and/or published between 1852 and 1855 (footnote, p. 88), including the October 1854, January and July 1855 issues of the *ENPJ*. There are as well two later papers published in 1868 (and often misdated as '1867'). [See Lindsay 1868a,b]. But the 1854/5 paper (s) are encountered in the literature far more often than references to his earlier work (1851) and later contributions. "I beg to present to the society," Lindsay writes, "...the tabulated results of between 500 and 600 experiments... the object of which was...to call attention to... our own island lichens capable of furnishing dyes nearly, if not quite equal in beauty to orchil, cudbear and litmus." For this purpose he recommends "certain genera and species...abundant in Scotland" which would "at moderate expense" substitute for imported lichens (p. 228). What follows are extensive charts listing dozens of species Lindsay tested in his laboratory (as did Stenhouse, whom he criticizes); variation in dye results among the same species collected at different times of the year and in different locations; and the use of different assists. Although Lindsay realizes that in chemical terms neither AM nor BWM dyes require mordants, he uses a variety of alkalis and acids to vary pH as he illustrates in Table II. Lindsay uses alcohol as the solvent to dissolve the "colourific principles of the plants" which is a process identical to that used more than a century later by Brough. Lindsay claims this is effective because it does not interfere with "ammoniacal maceration" or otherwise alter colour results beyond the shift from orcinol to orcein. It is significant that although this chemistry is not described by Lindsay in precise terms, it is by his Glasgow rival, Stenhouse 1848. This paper remains somewhat unsatisfactory, for although it is accessible to the non-scientific reader due to the straight-forward language used, it offers little beyond endless colour descriptions. Is that why the 1856 book is so useful a contrast? The cultural context of the latter makes a difference; but certain of Lindsay's more quotable prose here is entertaining: "If commanders and masters of ships were aware of the value of these plants... they might, with a slight expenditure of time and labour, bring home... such a quantity...as would realize considerable sums, to the direct advantage of themselves and the ship owners; and consequently, to the advantage of the state. It is with a view of inciting those to whom the opportunity may offer of gathering a valuable article of commerce...that I subjoin some simple methods." (p. 250).

Lindsay, William Lauder. (1856). *A Popular History of British Lichens*. London: Lovell & Reeve. [See also Westring 1805-9]. It is tempting to compare this outstanding book to Westring, but in my opinion, such a contrast would obscure the merits of both. True, both authors were physicians, although Lindsay's subsequent tenure at the Murray Institute in Perth is one described as "twenty years' worry at the head of a lunatic asylum", and given as the reason for his death at the age of fifty-two ["Obituary notices." *Trans. & Proc. of the Botanical Society* (Edinburgh); Vol. XIX (Pt. 2), 1882, p.163-164]. What did these two men have in common, Westring at the royal court, and Lindsay, described in the obituary as a "scientific recluse"? Very little, in my opinion, aside from a shared conviction as to the prodigality of lichens in remote regions of northern Europe and the potentially lucrative harvest thereof. Lindsay's book is somewhat less elegant than Westring 1805-9, perhaps due to its smaller size. But at 351 pages, it is remarkably compact as a prototype of the modern field guide. Unlike some identification aids, the illustration of lichens are still useful today. It is truly remarkable that Lindsay himself did many of the botanical drawings that make this book so attractive. Notable in the comprehensive text, which is arranged according to botanical classification by family and genus, are Lindsay's endnotes (there are also occasional footnotes, as on page 88 where he describes the confusing chronology of his much-published articles); a botanical index; and a subject index. In Lindsay's opinion lichen dye studies are "in a most unsatisfactory condition" (p. 85). Thus his reconstruction of the English dye industry and the trade in Scandinavian lichens, the majority of which were umbilicate species from "the mountains of Norway" (p. 89), helps to establish this link in the historiography. But Lindsay raises as many questions as he answers in this book. At no time, for example, does he suggest that "the cudbear manufacture, which is now extinct in Scotland" (p. 89), was in fact responsible for the greatly diminished lichen flora of the British Isles. This former biodiversity is elsewhere alluded to (Richardson 1975, 1988, 1991) and in sources in this thesis more blatantly proclaimed today as a redoubtable legacy inherited by the modern craft dyer (see my essay, p. 5-7). Were Lindsay's motives in promoting the rural lichen harvest as an economic incentive altruistic? If so, would not his perception of lichen abundance be consistent with his view of the plants as natural resources that were renewable, as agricultural crops? In quantitative terms, while Lindsay does not provides data on the value of the highland lichen harvest to the individual worker, he does describes the relative worth of various species of imported *Rocella* (p. 136).

This data is included as a mean to reinforce Lindsay's support of the Scottish harvest as having value beyond what was then recognized. This point is "hammered home" in his articles. Here, it is a more measured logic that proceeds alongside copious quotations from Victorian poetry that extoll the virtuous attributes of lichens. And while in this book we can trace the spelling of "orchill" (with two 'l's") directly to Lindsay, we cannot place on him the burden of the misspelled "Rocella" (with one "c"), for which British researchers appear to have a particular penchant (see Robinson 1969, Taylor 1990, Walton 1989). That Lindsay's book is still available in many university libraries is a testimony to its usefulness and timeless visual appeal.

Lindsay, William Lauder. (1868a). "On the present use of lichens as dyestuffs." *Journal of Botany* (London), Vol. 6, p. 101-109. Given the confusing chronology and a predilection for rewriting and simultaneous submission, one could be forgiven for mistaking this article for 1868b. Others have done just that. Kok includes this as '1867' which is when Lindsay actually claims it was read to the British Association" (p. 101). Furthermore, Kok decides there are, after all, only *two* papers: this one and Lindsay 1854. Lindsay begins his argument in support of indigenous AM lichen dyes rather like Cuthbert Gordon in his parliamentary appeal, by appealing to xenophobic tendencies to restrict foreign dyestuffs. Before he recites the many ways in which lichen dyes are superior to aniline, Lindsay takes the unusual approach of citing evidence to the contrary. He refers to a claims by a Glasgow calico firm which had spent some £10,000 or £12,000 on an aniline patent when they discovered their 'orchil' "did not stand [for] the hue is not permanent." (p. 102). "The present communication," Lindsay continues, "is to show that all predictions showing the displacement of lichen dyes by aniline...are at least premature." Lindsay reports that "there exists abundant evidence of a long future of usefulness for lichen dyes in this and in other countries..". (*Ibid.*). He also makes an important distinction in regard to various species of *Rocella* - distinctions that have been overlooked by scholars who often decline to name species, or else focus exclusively on *Rocella tinctoria*. In Lindsay's view *Rocella fuciformis* from Mozambique and Ceylon is the preferred species due to its higher concentration of substances. Lindsay's opinion is shared by a modern lichenologist who confirms that *R. tinctoria* was unlikely sufficiently abundant to have been the sole basis of commercial orchil manufacture (Pers. com. J. Laundon, Surrey, September 3/92.)

Lindsay, William Lauder. (1868b). "On the present use of lichen dyestuffs in the Scottish islands and highlands." *Seeman's Journal of Botany*, Vol. 6, p. 84-89. (Subtitled: "Being a portion of a paper read before section B of the British Association at Dundee, September 1867, by Dr. L.[sic] of Perth"). In spite of the similarity of titles, the contents of this article are substantially different from 1868a. The assumption that these articles are identical is possibly why Llano and Perkins include neither 1868 a nor 1868b. The omission is a serious one for there is much here that is provocative. This paper is the first instance where Lindsay acknowledges gender in the domestic textile industry of the Scottish highlands and islands. He specifically makes reference to the status of those women who contribute textile production to the economic life of the Hebrides. "The yarn is thus dyed," (with crottle; *P. omphalodes* and/or *P. saxatilis*), "and the articles of clothing woven or knitted, for the most part, by the female part of the population, and of all grades, from the minister's wife to the poorest cotter, chiefly during...the long winter." (KDC insert & emphasis; p. 86). The reference here to all ranks of women doing the same work is extremely unusual in literature from this period. Also important is Lindsay's observation that there exists "extreme variety of practice as to the precise process of dyeing." He finds it is not uncommon for crottle to be combined in the dye bath with other plants (p. 86), a botanical thrift that is significant for its rarity in literature from any period, and one akin to modern 'salvage botany' as defined in Casselman 1996c. But the most controversial opinion here is Lindsay's claim that Hebridean dyers do not know how to make AM dyes. This view refutes what has long been accepted as a traditional skill on the Harris and Lewis, one that is also consistent with Edmondston's observation of Shetland practice in 1844. "No form of ammoniacal maceration is resorted to," Lindsay maintains, and "the former use of putrid urine...appears to be unknown." (p. 86). What does Lindsay mean by "former use"? Is this an equivocal statement that Hebridean dyers *cannot* make AM dyes? Or does the statement suggest that indigenous AM dyes had diminished by 1866? Is this a matter of cultural erosion, or economics? What follows is equally puzzling, for Lindsay states that commercially-manufactured cudbear is available at every grocer's in Stornaway. (p. 88) Can we interpret Lindsay's cudbear commentary as an answer: why make dyes when you can buy them? Women make dyes to save money; moreover, there was the need if we accept Lindsay's claim on page 87 that aniline dyes were not available in Stornaway shops in 1866. There be several possible interpretations of the absence of AM dyes on the Outer Hebrides

at this time, but it is culturally inconsistent to find AM dyes in Ireland (Rutty 1772), Norway (Høag 1976), Færoe (Clark 1982) and Shetland (Edmonston 1844), and not in the Hebrides. Logan's 1833 wry comment on commercial cudbear notwithstanding, Lindsay seems to imply not that island women have never known how to make AM dyes, but that the knowledge may have been lost. If this is the case, what explains the cultural erosion of AM dyes in the Outer Hebrides? Given the lack of money in Hebridean society at this time, would dyers not have made their own AM dyes, if the appropriate lichens were available? As identified in *The Gorsebrook Papers*, traditional ecological knowledge plays a role in the recognition of the economic and cultural potential of indigenous flora; people use what they have to make what they need. Is lichen biodiversity part of the answer? (I have seen AM species on the Outer Hebrides, lichens such as *Ochrolechia*, *Pertusaria*, and various species of *Umbilicaria*; but possibly AM lichens were earlier overharvested? Does barter explain the popularity of commercial cudbear in a cash-short society where the commercial product was traded for handwoven and knitted goods, thus eliminating the need to make AM dyes? If Lindsay is right, and Hebridean dyers purchased cudbear instead of making their own, then it is a statement that must be further scrutinized if we are to evaluate historical AM dyes in regard to contemporary Hebridean praxis.

Maclagan, Robert Craig. (1898). "On Highland Dyeing and Colourings of native-made Tartans." *Transactions of the Royal Scottish Society of Arts*, Vol. 14, p. 386-410. The charm of this essay on the etymology and folklore of dyeing derives from the author's delight in demonstrating his interpretation of (and disagreement with, in some cases) the scions of Gaelic literature, including George Buchanan, Eugene O'Curry 1873 and Logan 1833. "I have no doubt," writes Maclagan, "that when Buchanan speaks of the highlanders using a colour...resembling the heather so closely as to render them almost invisible...that he alludes to the use of crotal." (p. 406). And this description of gathering lichens is more vivid, more memorable, than *all* of the others combined: "An old friend," writes Maclagan, "...recollects how his nurse used make him speil up the tree in his kilt, and then holding on firmly with his arms and legs, glide gracefully down while she caught the crotal in her apron." The description, Maclagan continues, "is sufficiently comprehensible without reproducing the diagram which accompanied the letter." (p. 406) This and other references to gender and lichen dyeing are

an unparalleled glimpse into late 19th-century Scottish country life. A case in point is Maclagan's claim that dyeing should remain "the work of women." (p. 398) because the use of "fual" (stale human urine) means dyeing "is not an easy subject of conversation." (*Ibid.*) Maclagan is the source of ninety percent of the folkloric references to lichen dyes found in modern dye manuals such as Fraser, but what these authors should have taken from him richness are details that most manage to miss. One is that Maclagan identifies the inherent weakness of the "is said to yield" approach (p. 402); he hints that oral sources may be unverifiable. He also differentiates between corcur as an AM dye, and crotal as a BWM dye name (p. 406), an etymological and botanical distinction which is the basis of my recommendation that the latter name be applied only to *Parmelia* spp. (Casselman 1994b, 1994c, 1996c). Maclagan's weakness here, however, is that he includes vernacular dye names found nowhere else: corklet (p. 403) and crotian (p. 408) are bound to be repeated, minus a cultural context, and they provide yet more evidence of the need for a lexicon of AM and BWM dye names. But outstanding among the gems of truth in this rich assemblage of history, folklore, language and custom is the debunking of the much-quoted magenta dye from dandelion root. The suspicious 'magenta' from dandelion root is the 'litmus test' for natural dyers, a way to measure the value of an author's original research. Kok [in Dunbar 1962] and Grierson 1986 are outstanding examples of verifiable praxis. Maclagan's is a useful model with his 'fictitious native dyes' list (p. 396). This should mean that errors of interpretation are not perpetuated. Unfortunately, that is not the case; Maclagan himself continues to be included in the bibliography of books that contain recipes for 'magenta' from the root of *Taraxacum officinale*, proof that you cannot make an author read what they claim to have used as sources.

Napier, James. (1875). *A Manual of Dyeing and Dyeing Receipts Comprising a System of Elementary Chemistry as Applied to Dyeing*. Third edition. London: Griffin & Co. The section on "archil, or orchil" (p. 306-308) may be chemically correct, as suggested by the title. But there is a considerable misunderstanding of the same type that characterises Hart 1898. Napier makes no distinction between "the lichen *Roccella*" from the Canary and Cape Verde Islands (p. 305) and indigenous lichens of northern Europe. Immediately following the southern locations for *Roccella*, there is a semi-colon; Napier then adds cryptically: "but it is also found abundantly on the coast of Sweden, Scotland, Ireland and Wales, and the people have from

time immemorial used it for dyeing cloths" (p. 305). One could reject Napier as imprecise but his separation of archil/orchil from cudbear is exact: the former, he claims, is a "pasty matter", the latter, a "red powder" (p. 306). This distinction is possibly one basis for the difference between the commercial product (the powder) and the domestic product (the paste).

O'Curry, Eugene. (1873). *On the Manners and Customs of the Ancient Irish, Edited with An Introduction, Appendixes, etc. by W.A. Sullivan.* Volume 1, 3. London & New York: Williams & Norgate, Scribner. This remarkable collection is full of language, music, poetry, and a text that wanders through each topic just as one wanders, in Ireland, searching for more ways to comprehend the richness of the landscape and culture. O'Curry died before this work was finished; lacking are notes and citations that would lead one deeper into his sources. Overall there is much merit here if one brings to the reading a modicum of restraint. It is a convoluted journey with few sign posts for the reader. Even a comprehensive Gaelic and English index cannot always assist passage through a complex method of pagination (Latin numerals for pages in excess of three hundred, for example); the insertion of "corrigenda" before the Introduction (in Vol. 1); numerous 'addenda' and other appendixes; Gaelic footnotes on every page; and topic 'sidebars', complete with line drawings. One example is that there are more dye references in "Introduction" (Volume 1, cccc-cccii) than there are in the chapter on "Dress and Ornament" (also in Volume 1). Sullivan admits he was "...very anxious that the publication...take place with as little delay as possible," and that he enlisted the aid of his "dear friend, the late John E. Pigot" (who had apparently assisted O'Curry) until Pigot's departure for India left Sullivan to face the task alone. And here is what Sullivan is forced to admit: "The manuscript of the Lectures as written out for delivery contained no pages of the Codices from which O'Curry drew his materials. and in some cases, the Codex itself was not even named." (Vol. 1, p. 8) How reliable, then, is O'Curry? He is entirely accurate with his identification of crotal specifically as *Parmelia omphalodes* and *P. saxatilis* (Vol. 1, cccci), and corcur as the "cudbear lichen" *Ochrolechia tartarea* (*Ibid.*). It is interesting here to compare the veracity of Hart 1898, a botanist, with O'Curry, who was not; and to discover that O'Curry, years before, had it right. O'Curry is a folklorist, a linguist and a material culture specialist. He takes risks in interpretation that in this thesis I have identified as essential if the subject of lichen dyeing is to advance our understanding of human culture. An example is his claim that AM

lichen dyes in Ireland pre-date by centuries the period when crotal and corcur and cudbear are reputed to have first been in use. (Vol. 1, dextliii) As evidence, O'Curry offers a reference to 'corcur-coloured flowers' in a pre-medieval Irish manuscript, the presumption being that this description could not pre-date the existence of such a dye. This claim is among the most significant AM dye reference in this thesis. Furthermore, O'Curry is not speaking here of *O. tartarea*, but of *Umbilicaria* (*Ibid.*), which makes this reference even more exciting. The significance of O'Curry's interpretation here is this: it provides another source for the analysis of pre-medieval lichen purples which are clearly not murex (see Taylor 1986, Walton 1988). O'Curry amplifies and illuminates considerable archaeological evidence of northern European AM dyes as early medieval products of indigenous trade and manufacture (Furley 1927, Hunt 1995). That neither the existence of such dyes nor even the possibility was discussed prior to Kok 1966 underscores her considerable contribution. And it should as well redirect the attention of scholars back to sources such as O'Curry where the etymology, the botany and the cultural context for dyes are on fairly firm ground (compare Mahon 1983) if we remain alert.

Parnell, Edward A. (1860). *A Practical Treatise on Dyeing and Calico-Printing; Including the Latest Inventions and Improvements; also a description of the origin, manufacture, and chemical properties of the various substances employed in these arts*. New York: John Wiley. The historical section of this under-valued manual contains a more complete description of the history and use of murex than virtually any other source. True, the account is dated in tone; but the cultural detail is rich in literary references (Ovid, for example: p. 8); biology (anatomical descriptions of *Murex* and *Purpura*: p. 9); and the actual method used to extract the dye (p. 9-10). The "archil" section makes reference to Westring's work, and to his dye experiments (p. 50). Parnell also claims that when applied directly to marble, AM dyes "communicate a beautiful violet colour, or a blue bordering on purple" which is unchanged "...at the end of three years." (p. 49). The author is persuasive in his opinion in regard to orchil's beauty, diversity of colour, and its ease of application.

Ross, Alexander, et al. (1896) *Scottish Home Industries*. Dingwall: Lewis Munro. Although bound and printed as a hardcover 'book', this undated report by Provost Ross, the Duchess of Sutherland, and other dignitaries associated with SHI was likely circulated primarily

to board members or directors of the Scottish Home Industries Association. What is remarkable here are opinions of the time as they relate to lichen dyeing and gender. Ross' contribution (which comprises 60% of the text) includes an extensive dye chart (p. 15-17). Among the six species of lichen he includes are *Ramalina scopulorum* (one not often mentioned), *Parmelia saxatilis* (always included) and *P. omphalodes* (but by the incorrect name, "P. cerato phylla"). Misspelling is a useful clue to the 'misinformation trail'; in this case, the incorrect Latin name is picked up by Adam 1934. More provocative is Ross's opinion that highland women need to improve their dye methodology. He claims female dyers show resistance "to any man [who] might enlighten them" so that SHI must search, he advises, for "a skilled woman" to help in this regard (p. 106; see Mrs. Hart's initiative in Hoad 1987). The Duchess, however, presumably a woman of style, dismisses both the crottle dye process and the colours. "The preponderance of yellow in tweeds so dyed", she claims, are "rejected or bought more as charity". (p. 110). [See Boland 1904]. Gender specific references and contemporaneous opinions on dress and fashion are sufficiently rare that we must acknowledge the considerable value of this source, although the Duchess' comments are inconsistent with the economic value of lichen dyes in the tweed industry. This value was so significant as to perpetuate the myth that lichen dyes were used long after the fact (Llano 1951).

Ure, Andrew. (1858). *A Dictionary of Arts, Manufactures and Mines*. New York: Appleton & Co. [See also Berthollet 1824]. Volume 1 & 2.. Volume 2 of this comprehensive work by a physician and chemist who was also a technocrat, contains a section on 'orcine' Although the chemical principles are somewhat tedious to read, what emerges is evidence that exposure of lichen substances to air "charged with vapours of ammonia", produces a "fine violet colour" (p. 308). Also noted is the pH shift whereby the exposure of orcein to acids produces colours that are more "red" than "purple." This is precisely the method craft dyers use today (Casselmann 1993a, 1996c).

1900-1929

Aisen, Maurice N. (1916). *History of Dyes and the Art of Dyeing*. New York: White & Co., 1916. Dr. Aisen was a chemical engineer whose mission was to "popularize this subject and

suggest to the reader the broad scope" of what he claims is a "one-sided view" of the coal tar industry (Preface). Although synthetic dyes comprise the bulk of the information, there is a brief and correct mention of orchil and cudbear. Aisen makes two provocative statements that are worthy of note: he attributes the origin of natural dyeing to China (p. 8; see Barber 1999); and unlike those who claim that lichen dyeing died during the Dark Ages (of whom Leggett 1944, 1949, is one), Aisen cryptically implies that this was the case for *all* dyeing.

Boland, John Pius (M.P.) (1904: Saturday, April 23). "A Plea for Natural Dyes." *The Kerry People*. This newspaper article is extremely significant in economic and ecological terms. "Experts are of the opinion," writes Boland, "that the market value of homespuns depends not merely on the quality of the weaving, but to a very great extent on the dyes that are employed." A comparison of this article with contemporary Scottish sources of the period (Ross 1896) provides a stark contrast with the Duchess of Sutherland's opinion as to the market value of lichen-dyed tweeds (not to mention Lindsay's view of the economic benefits of lichen harvesting; see Lindsay 1868a). Furthermore, Boland also includes one of the very few Irish references to *Umbilicaria*. Is Boland simply citing O'Curry's 1873 mention, or is he in fact passing along information of the 'is said to yield' variety? If this reference is a valid one, it is significant as possible confirmation of the earlier report.

Canadian Handicrafts Guild. (1916). *Recettes Choisies pour Teindre Les Tissus. (Select Recipes for Dyeing Wool.)* Montreal: CHG. [See Smith 1934; Soeurs 1941]. Although there are but two lichen dyes included, this modest brochure under the imprint of the CHG stands as important evidence that lichen dyeing in eastern Canada was as firmly rooted in French culture as it was in the Scottish immigrant tradition [See Bennett 1998] and English practice in Quebec [*Family Herald* 1927]. No Latin names are provided for what translates as "common yellow wall lichen" (*Xanthoria parietina*) on page 7, nor for "rock lichen" (*Umbilicaria*?) prepared with "ammonia". Contributions such as this one, albeit from a national organization, might appear at face value to offer little; yet I believe the opposite to be the true. In my essay (p. 15) I contend that French language contributions to the subject have been overlooked in Europe, including in France. In my opinion few - if any - American publications during this same period exceed in value these little known Canadian contributions.

Christensen, Hilda. (1908). *Lærebok Farvning i med Planter (Handbook of Dyeing with Plants.)* Oslo: J.W. Cappelens. Although there are no Latin names here, 'stenlav' is a typical Norwegian BWM dye that Sami dyers immediately recognize as *Parmelia omphalodes* and *P. saxatilis* (O. Isaksen & O. Nilsen, Manndalen, July 2, 1999). Given the period, this book is a vital and important link between a culture that was still essentially rural, yet one that was also in transition. The presence of korkje-dyed textiles in American museum collections [Gilbertson & Colburn 1997] suggests the persistence of korkje practice which is cast into doubt in this book where the absence of AM dyes in more than 120 recipes is incomprehensible in light of recent research (Casselman 1993d,e; 1994a; 1996e; see also Vågen & Engelskjøn forthcoming).

Edge, Alfred. (1914). "Some British Dye Lichens." *Journal Society of Dyers and Colourists*. Vol. XXX, p. 186-188. [See below]. Edge begins these much-quoted articles with a claim that *Rocella fuciformis* and *R. tinctoria* are not "British" lichens; ergo, he argues, "orchil" is not a British dye. He is correct. He next sets out to prove there are indigenous lichens which could be used to manufacture similar dyes on a commercial basis. Significant here is the author's declaration that cudbear, *at the time of writing*, is also made from imported lichens (p. 186). This confirms the existence of a dye by that name well into the present century, a point of some confusion (*Encyclopedia Britannica* 1878). Glaring to the postmodern reader is the association of crottle with "peasantry" which Leggett 1949 perpetuated well into mid-century (p. 187). Also troublesome is the mythology and folklore section of this article where lichen dyes are linked to the clothing of fairies in such a way as to either raise a smile or cast doubt on the veracity of the first portion of the text.

Edge, Alfred. (1915). "The Colouring Matter of "Tree Moss" *Journal Society of Dyers and Colourists*. Vol. XXXI, p. 74-75. The 1915 includes the distinction between the two primary dye categories which Edge categorizes as those which give "purple by oxidation in presence of ammonia", and the "so-called dye crottles which dye wool direct."

Goodrich-Freer, Ada. *The Outer Isles.* (1902). Westminster: Archibald Constable & Co. What is remarkable about this book on Hebridean history and folklore is that it compares

favourably with publications written many years later by Celtic authorities such as I.F. Grant (1961), Dorothy Hartley (1939, 1979) and Brid Mahon (1982). The much-quoted "what comes from the rocks, returns to the rocks" is here in its correct form (p. 203; see also Shaw 1986). There is more than a modicum of veracity when the author includes a very rare example of a verse about lichen dyes:

'Tis not the indigo of Edinburgh
That would be for clothing to these kites (*tots, tykes, children*)
But lichen gathered by finger nails
Scratched off the rocks.

Although there is neither footnote nor bibliography to provide a source, this verse, when added to Shaw's Uist folk songs with their references to crottle, expands a slim body of evidence that shows how the cultural role of lichens includes the harvest, the workers, and the dyes.

Hartley, Dorothy & M. Elliot. (1926-1931). See AD 1400. [See also Hartley 1939].

Hellén, Alina. (1918). *Anvisningar i hemfärgning. (Advice on Home-Dyeing.)* Helsingfors: Kansanvalistusseura, 1918. [Second edition.] This charming little book is the epitome of ethnicity, but deceptive for it contains 164 pages of *Swedish* text, written by a Finnish author. The lichen dye section is more complete and extensive than is the case with later books that are more widely known, dye manuals such as Kontturi (1947) and Klemola (1978). Hellén includes *Cladonia rangiferina*, *Cetraria islandica*, *Usnea barbata* and a number of other species that suggest the author may have had exposure to a definitive and earlier source such as Westring. Notable among Hellén's recipes is one for *Parmelia furfuracea* (*Pseudevernia furfuracea*), a lesser-known lichen dye attributed by Bolton to Lindsay 1856. Unfortunately, this book contains no bibliography to show such influences but the text does include historical references. It has a more sophisticated tone than later books that appear to have used this one as a foundation, without, it would appear, giving due credit to the Finnish author. Her work, in my opinion, compares favourably to the quintessential manual of this period, Mairé 1916. I suspect that as is the case with Francophone contributions [Canadian Handicrafts Guild 1916], ethnicity is likely a factor in a lack of cultural recognition.

Hodge, Frederick Webb (ed.) (1912). *Handbook of American Indians North of Mexico*. 2 Volumes. Washington: Government Printing Office. A subsequent edition is Greenwood Press, 1969. There is a tendency today to dismiss Eurocentric literature on the grounds that it dishonours and denies aboriginal culture, a problem I discuss in my essay (p. 12). Hodge is included here because his generalized reference to lichen dyes (p. 408, Vol. 1) may have spawned a widely-held perception that lichen dyes are intrinsically valuable in aboriginal culture. This *is* the case in modern North America, confirmed by Brough 1988 and Turner 1979. But it is *not* necessarily the case historically. There is value in drawing attention to this misperception to encourage the search for evidence such as Isham 1743. I learned as recently as 1999 that Hodge has been removed from library shelves because of the bias. [See also Wallis & Wallis 1955.] To deny the problem does not address a solution. If by acknowledging the problematic literature we also draw attention to over-looked sources (Isham 1743) then the knowledge of aboriginal technology is advanced.

Horwood, Arthur Reginald. (1928). "Lichen dyeing today: the revival of an ancient industry." *Science Review*, Vol. 23, p. 279-283. [See Casselman 1998b]. The lack of Latin names in this well-known article indicates a non-scientific approach inconsistent with the journal in question. (Compare Edge 1914/15 who surpasses Horwood in this regard.) The comparison of these two British science writers is apt because both are cited in contemporary manuals. In the case of Horwood, one wonders why? Horwood claims that AM dyes such as orchil and cudbear are substantive, and thus require no mordants; yet in the same paragraph, he writes that the same dyes "...not being permanent...are made so by the addition of alum or some other fixing agent." (p. 279). Such inconsistencies plague this article which offers little else to recommend it other than the oft-quoted but unsubstantiated reference to cudbear "cakes" which are wrapped in dock leaves and "hung to dry in peat smoke" (p. 282).

MacKay, John Gunn. (1924). *The Romantic Story of the Highland Garb and the Tartan, with an appendix by Lt. Col. Norman MacLeod dealing with the kilt in the Great War*. Stirling: Eneas Mackay. In the section on "Native Dyeing," MacKay credits one "Mr. Lees, manager of the Portree Tweed Mill" with the list of native dye stuffs included in this book, as

well as information on dye processes used in the Highlands (p. 59). Few authors are as forthright in the identification of their informants which in this case involves an individual who is apparently well versed in dye methodology and dye mythology. Notable in the latter category are a variety of common and Gaelic names for AM and BWM dyes. But this account also includes one unusual and highly significant reference to an AM lichen dye aged not for three weeks but for three *months* (p. 63). The lichen is not named, but the dye is described as 'corcur' (*Ibid.*). Corcur is a common synonym for cudbear and similar AM dyes made from *Ochrolechia tartarea*, dyes that are generally aged only three weeks. Those AM dyes that are aged for three months are based on *Umbilicaria*. That distinction is noted in contemporary dye manuals where it is the basis of identifying the essential difference between European lichen dyes and those AM dyes made in North America (Casselman 1996c). The three month fermentation period included by MacKay suggests possible links to two Irish references to *Umbilicaria* already noted here, Boland 1904 and O'Curry 1873.

MacKay, Mrs. Anstruther. (1911). Handbook of Simple Home Dyeing. Lochalsh: Home Industries. Ryan & O'Riordan 1917 claim this is a "pamphlet published by the Scottish Home Industries, *Edinburgh*, but my copy contains no such imprint. This modest booklet is significant for it provides a link between the 'official' reports on lichen dyeing (Ross 1896) and instructional material at a time when the activity was an agricultural initiative for rural women. MacKay's publication also serves as a useful model of what was perceived in Ireland, apparently, as an example of the superiority of highland expertise (see Hoad 1987). Little is known of MacKay, but she may have been the best-known practitioner in her time and place. There are clues in the text. "The question of dyeing," she writes in the introduction, "is usually one of the most difficult problems which present themselves to managers of homespun industries." This suggests the author may have been such a manager. "The repulsive and haphazard methods...pursued by old-time cottage workers do not commend themselves to the villager of today," she continues, thereby distancing herself from the practitioners. And so we can speculate that what follows are accounts of dyeing where the author is an on-looker or a recorder. The lack of Latin names is not inconsistent at the time, considering that scientists such as Horwood did likewise (compare Earle 1898 in this regard). But the potential value here is obscured by confusion: a tendency to describe AM dyes as 'crotal' (a BWM dye name)

which contributes to the misinformation highway. It also tells us little about the role of Scottish Home Industries in the early 20th century promotion of lichen dyeing. The most remarkable reference here is MacKay's *Umbilicaria* dye that is brown. The Sami dyers of Manndalen also use *Umbilicaria* to make brown instead of the AM purples with which this genera is identified. (Interview, Olaug Isaksen, Norway, July 3, 1999).

Mairet, Ethel M. (1916). *A Book on Vegetable Dyes*. Original edition, printed by Douglas Pepler, Ditchling, Sussex: Hampshire House Press; (1917) Second edition, Ditchling, Sussex: Hampshire House Press; (1931) Revised edition, fifth printing, Ditchling, Sussex: St. Dominic's Press. *Vegetable Dyes: Being a Book of Recipes and Other Information Useful to the Dyer*. London: Faber & Faber, 1938, 1952. There is almost as much confusion in regard to the various editions and imprints of the most published dye manual of all time as there is about lichen dyeing. The frontispiece of the original edition is illustrated in the Mairet biography by Margot Coatts (see Kilbride 1979). Among the wide variety of imprints/editions/reprints included by sources in this thesis are the following citations (given here *precisely as they appear in the source*): First edition, Ditchling Press, 1917 (Davenport 1955); Hammersmith, Pepler, 1917 (Kierstead 1950); New York, Chemical Publishing Co., 1939 (Weigle 1974); fifth edition, Boston, Humphries, 1931 (Robertson 1973); Faber & Faber, London, 1939 (Fraser 1983); Faber & Faber, 1941 (Goodwin 1980); 11th edition, Faber & Faber, London, 1952 (Lesch 1970; she means the eleventh *printing*, according to my copy of the 1952 edition. The many versions of Mairet illustrate the legacy of a contribution whose popularity and relevance spans four decades. At the time when she wrote this book Ethel Mairet was an Arts and Crafts Movement activist who sought through her work to educate popular taste. A disciple of William Morris, and a woman of strong convictions, Mairet chose to vent her wrath, directed at synthetic dyes, in the preface of this first edition. It is a feature which identifies the 1916, 191, and 1931 editions - one that is conspicuous by its absence in the subsequent Faber & Faber imprints. The handmade paper of the early editions and the vituperative prose in the preface made my first reading of Mairet a memorable experience. "We fear bright colours," writes Mairet in the preface, "because our modern colours are bad, and they are bad because

the tradition...has been broken. First came the hideous aniline colours, " she continues, "crude and ugly" which cannot compare to natural dyes that "mellow, one with the other, into a blend of richness that has never been got by the chemical dyer and never will be." (*Ibid.*). Mairet had ample opportunity to observe and record praxis inside her own cultural heritage, and far beyond. Mairet claims natural dyeing is almost a lost tradition in England and that it survives primarily in locations she identifies as Scotland and Ireland, Norway, Russia, Central Asia and India. Perhaps this explains her attitude - that she is the one who will rescue a textile tradition in eminent danger of being lost. There is fairly good evidence from living sources that the crotches Mairet used at the Gospels workshop were the result of the traditional ecological knowledge and/or the ethnicity of her dye masters. Valentine KilBride was one of these (see Kilbride 1979), as was the father of dye historian David Hill (Hill 1998). This fact does not diminish the value of Mairet's section on lichens which includes references to dyes in Ceylon and India where she travelled extensively to collect art and textiles. The Latin names in this book are 75% correct, and their vernacular equivalents throughout northern Europe are consistent with the names found in other sources of the period. But Mairet's tone is precisely what conveys authority. Her father was a chemist; she herself was well-educated and had connections to Oxford that allowed unrestricted access to the Bodleian where according to her biographer, Mairet first studied old books on dyeing. Moreover, Mairet's first husband, the elegant Eurasian Ananda Coomaraswamy, was not only trained as a botanist; he also obtained a doctorate in mineralogy, was a musician, and later wrote on medieval Sinhalese art. Ethel and her first husband, as well as her second, Philip Mairet, were art collectors, bon vivants, and creative spirits who epitomized the sophistication, style and artisanal substance of the early 20th century. To her credit, Mairet was a textile pioneer. Among the hundreds of sources in this bibliography, Mairet is one of few who mention Westring. But although she claims in the 1944 edition that "the bibliography has been more or less kept up to date", this is not the case. Neither the original nor subsequent editions and imprints include Westring in the bibliography in spite of his prominence in the text. There are other gaps in her legacy. Mairet applied BWM names to AM lichens (and vice versa), but this is not more of a problem than the incomplete citations. In my own library is a copy of an unpublished document which may be a portion of manuscript of the original edition of *Vegetable Dyes*. Clues as to the provenance of this document include the author's name on the cover which is given as "Ethel M. Mairet".

Subsequent Faber & Faber imprints omit the middle initial. It is rather ironic that the manuscript pages in my library comprise the confusion over vernacular names for AM and BWM dyes, and the individual cryptically identified as "Dr. Westring".

Mason, Otis Tufton. (1904). *Aboriginal American Basketry: Studies in A Textile Art Without Machinery*. Washington: Government Printing Office. (Also issued as Annual Report of the Smithsonian Institution for the Year Ending June 30, 1902.) Only two sources included in this thesis make reference to Mason's work, Amsden 1934 and Weigle 1974. Weigle's bibliography lists *Aboriginal Indian Basketry*, Glorieta, NM, 1972. Amsden's reference is to a 1902 edition for whom no publisher is given. The quantity of Mason's information on lichen dyes is not why I have included this book. It is significant not because of lichen dye recipes but due to a remarkable watercolour illustration of a common western lichen, *Letharia vulpina*. The association of lichen dyes with aboriginal North American basketry is sufficiently under-recorded to make such a reference invaluable. Moreover, the quality of this illustration is on a par with Lindsay 1856 and Westring 1805. Given the abundant documentation to support the widespread use of this species as a wool dye (Samuel 1987, Turner 1979, Turner et al 1990), I have few doubts as to the efficacy of using *L. vulpina* and/or *L. columbiana* for dyeing basketry materials the "strong yellow" that is also the colour described by Isham 1743.

Purkiss, Eileen. (1927). "Women Find Fascinating Work in Dyeing: They Go to Fields and Woods for Materials." *Family Herald and Weekly Star*, Montreal, April 27. The craft work of the Lower Mainland (British Columbia) Women's Institute, exhibited at the New Westminster Provincial Exhibition, is the focus of this article in which home dyeing has "substantial results in affecting domestic economies." This report is persuasive evidence that home-based textile work can generate income while it also satisfies aesthetic needs. Lichens are depicted here as "one of the most ancient materials from which dyes are drawn." Species are not named, nor is the word 'crottle' used; but both AM and BWM lichen dye colours are described. The reporter is partially correct when she explains that "the natural colour of the lichen is no guide to the colour it gives" (*L. vulpina*, above, is one of several exceptions). In this report Purkiss also inadvertently perpetuates another myth: "Those skilled in the craft," writes Purkiss, "say that lichens from the rocks are richer in dye substances than those

found on trees." As lichens of a single species rarely occur both on rocks and trees (with notable exceptions, such as *Parmotrema tinctorum* and *Xanthoria parietina*), this much-repeated myth can in many cases be traced to manuals that have had decades of use, books such as Mairé 1916. The value of this article is its usefulness as a comparison to Collister 1944, for both advocate lichen dyeing as a skill linked to the value-added aspect of handmade textiles.

Rawson, Christopher; Walter M. Gardner & William F. Laycock. (1901). *A Dictionary of Dyes, Mordants and Other Compounds Used in Dyeing and Calico Printing*. London: Griffin & Company; Philadelphia: Lippincot & Co. Notable in this book is the use of orchil to counter fading problems in wool (p. 43). Because AM lichen dyes are reported by some to 'fade before your very eyes', this reference is extremely significant. Gardner's contribution to this book also contains the fullest description to date of the chemistry of orchil (p. 251-253) made from *Rocella fuciformis* (Africa, California) and *R. montagnei* (Ceylon, Madagascar). The Federigo 'discovery' story emerges here, yet again. But in this account there is a mixture of mythology and veracity. It is fascinating that Rawson et al give a precise date of 1295 when the 'secret' of orchil came to Italy (compare Crookes 1874). Moreover there is provocative claim here that the Italian monopoly was "short lived" because the "method of manufacture became quickly known" (p. 250). While this is not the case according to Woodward 1949, I would suggest that we need to re-evaluate her analysis in this regard. Evidence of vernacular orchil-type dyes throughout Europe during this period points to the widespread use of indigenous products. While Florentine orchil based on *Rocella* may have carried the greatest value, the higher price also meant there was room in the Hanseatic market for cheaper products from the north, dyes based on *Ochrolechia tartarea* and also *Umbilicaria*. (See MacKay 1924, Boland 1904, O'Curry 1873.) I would, however, suspect the exact date of 1295.

Ryan, Hugh and W.M. O'Riordan. (1917). "On the tinctorial constituents of some lichens which are used as dyes in Ireland. *Proceedings of the Royal Irish Academy*, Vol. XXXXIII, Section B, Part IV, p. 91-104. This paper provides an interesting comparison to Boland 1904, and a useful means by which to compare Irish sources with those from Scotland (see MacKay 1924). Using primary sources and the oral testimony of local informants, the authors construct a brief historiography of Irish lichen dyes, citing among others Rutt 1772 and O'Curry 1873.

Of far more interest in ecological terms is Ryan and O'Riordan's opinion of the abundance of lichens in Donegal when compared to Connaught. On page 92 there is a reference to the scarcity of lichens in the northwest where Donegal dyers find them "...not very plentiful," contrasted with Connaught, in the west, where "...certain lichens are still used...to dye woollen materials a dull saffron or brown colour." (*Ibid.*). While I cannot confirm or deny this, on the basis of fieldwork in both regions in the 1980s I can state that my perception was exactly the opposite. Nor can I confirm what Ryan and O'Riordan describe as the "fairly considerable quantity" of *Parmelia saxatilis* and *Ramalina scopulorum* present in Galway (Connaught), where both are apparently used early in this century for BWM dyes. Just as the Sami dyers of Manndalen, Norway, do not now recognize red/purple dyes made with species of *Umbilicaria* (pers. com. O. Isaksen, July 3, 1999) neither do the Donegal weavers circa 1917 according to this article. O'Curry 1873 offers a different opinion, whereas the Sami dyers use umbilicates to make BWM dyes). The second portion of this paper presents a thorough chemical survey of substances present in the aforementioned dye species, and also *Xanthoria parietina*. In regard to the dye potential of the latter, the authors' experiments in the acetone/ether extraction of substances from *Xanthoria parietina* lead them to dismiss it as inappropriate, a lichen that can "scarcely be regarded as a dye" (p. 104). There is considerable historical evidence to the contrary (Westring 1805). Modern data in that regard potential of *X. parietina* is attributed today to Irish dyer Ann Marie Moroney (Casselman 1996c, 2000d).

Smith, Annie Lorrain. (1921). *Lichens*. Cambridge: Cambridge University Press. There is considerable confusion over Smith's works in lichenology, which include one or two earlier volumes. Few agree on the number, titles and dates; compare bibliographic references to Smith 1911 & 1926 in Ursula Duncan's *Introduction to British Lichens* 1979, p. 267; and Llano 1944 includes a date of 1918. Dalhousie University, Halifax, has two 1918 volumes that are entirely different in content from the 1921 book cited here, one I first read at the British Museum Natural History. Smith cites Pliny as evidence of the antiquity of lichen dyeing but what is remarkable here is that she avoids bringing the subject into the present century other than to discuss economic aspects of lichens in industrial applications (litmus, for example, and perfumes.) When she does describes dyes in the British Isles, Smith avoids the "is said to yield" approach that is occasionally adopted by modern scientists (Hale 1983, Armstrong and Platt

1993) and focuses her attention instead on the etymology of Gaelic dye names. "In Scotland," she writes, "all dye lichens are called crottles but the term cudbear was given to *Ochrolechia tartarea*, either the lichen or the dye product." (p. 415). What is unfortunate in regard to Smith's more interesting references is their obscurity: I have not seen "J. Bohler. *Lichenes Britannica*, Sheffield, 1835" (p. 415) in which there is apparently a fairly contemporary reference to Cuthbert Gordon described as "Doctor," a mystery that remains unresolved. And yet it is from Smith that Llano and later writers such as Kok 1966 may have first learned that Westring's 1791 Swedish article was translated into French (Westring 1792). We cannot credit Smith with an orchil narrative that is entirely accurate as she subscribes to the 14th century 'rediscovery' story; but her interpretation is amplified in scientific terms with an excellent description of chemical variations among *R. fuciformis*, *R. montagnei*, *R. tinctoria* (p. 413). Smith cites "Linnaeus 1760" as her source for Lapland BWM dyes made with *Parmelia omphalodes*; she is incorrect as are others in their interpretation of the elusive *Plantae Tinctoriae* (see Jorlin 1759.) Smith also contributes to the misinformation trail when she attributes red and purple dyes to BWM lichens. This legacy has survived to a greater extent than the dyes that generate the mythology, but in the case of an authority such as Smith, the misunderstanding takes on added significance. Her error, however, is one that involves empirical knowledge: "It has been once and again affirmed," writes Smith, "that *Parmelia saxatilis* yields a red colour, but Zopf denies this." (KDC emphasis; p. 416.) Zopf was a German lichenologist who documented domestic dyes of the Tyrol, but it is unclear here who tried and/or denied what. But in my experience the colour derived from *P. saxatilis* is a rust-brown; and I have suggested elsewhere that the 'reddish' qualifier is often lost in the description of a colour that is more copper-coloured than it is red. (See Barber 1999 for the extent of this problem.) Debates as to how much red is contained in brown does little to advance our understanding the cultural nuances of praxis and the etymology of vernacular dye names. For evidence of the limitations of colour naming, compare the complex but sanctioned names described in Brough 1988, who uses one system, with colour names in Grierson 1986, who uses yet another. Furthermore, the standard colour charts that apply to scientific specimens are also not appropriate for lichen dyes. A new system of colour naming for AM and BWM dyes is as badly needed as agreement on dye names and ingredients. This is how Smith helps.

1930 - 1939

Adam, Frank. (1934). *The Clans, Septs and Regiments of the Scottish Highlands*. Third edition with a foreword by Thomas Innes. Edinburgh: W. & A.K. Johnston. There are at least six editions of this popular book published between 1896 and 1979. That having the most relevance to this thesis is this edition which includes in Appendix XXIV (p. 486-487) a chart of six lichen dyes listed by Latin and Gaelic names (p. 486-487). As is the case with Ross 1896, there are misspellings: thus *Lobaria pulmonaria* in Adam's list is 'pulmonacea'. Adam also borrows Ross's incorrect name for *Parmelia omphalodes* and repeats it here as 'P. ceratophyllia', but with only one 'l'. Like Ross, Adam also includes the fictitious magenta from dandelion root and thus perpetuates yet another myth of Scottish dye lore. But the mystery of Adam's text involves the footnotes below the dye chart where the author gives various opinions as to whether crotal and corcur (erroneously described by Adam as crotal corcur, or two parts of the same name) are still in use in the highlands circa 1880. The sources cited by Adam clearly do not agree in that regard. Evidence of the use of red and purple AM dyes in the Scottish highlands during this period should occur in sources such as MacKay 1900 and Ross 1896. But in both cases the red they describe is not an AM dye such as cudbear or cork but a 'reddish-brown' BWM dye misidentified by confusing colour names, a point I discuss in Smith 1921. (Mrs. MacKay attributes a red dye to a BWM lichen interpreted by me as *Parmelia omphalodes*, one that makes rust-brown dyes; Ross's red is also one that makes a BWM orange-tan from *Ramalina scopulorum*.) The sole contemporaneous source to whom we can turn for contemporary evidence that the AM dye tradition remained alive as a living skill in Scotland during this period is MacLagan 1898. It is true that fashion in changed, as acknowledged by the Duchess of Sutherland (Ross 1896) and this had an effect on the commercial popularity of certain BWM dye colours. It is also true that Lindsay identifies a lack of domestic AM dyeing in the Outer Hebrides in the 1860s. But according to my interpretation in this thesis, it is impossible to believe that domestic AM dyes were not made in Scotland in the 19th century. In addition to MacLagan 1898 there is evidence that my interpretation is correct in Grierson et al 1985a, b. But even their inclusion of AM dyes does not identify all the gaps in this narrative.

Amsden, Charles Avery. (1934). *Navajo Weaving: Its Technic and History*. Foreword by Frederick Webb Hodge. Santa Ana, Ca: The Fine Arts Press in co-operation with the Southwest Museum. There are many editions of this book; the most recent, published in 1991 by Dover, New York, contains no changes. As is the case with Mairé and Adam, this suggests that authority and expertise continue to have popular appeal even without revisions that aid the modern reader. Clearly here was an indefatigable scholar who exhausted every possible primary source available on the subject at the time. Navajo lichen dyes have in the last decade been thoroughly documented (Brough 1988) and photographed in the *National Geographic* (Sharnoff & Sharnoff 1997), but Amsden's "Native Dyes: Development" chapter (p. 67-93) remains today the most comprehensive treatment of aboriginal dyes in the United States. Among the topics relative to this thesis are the difficulty of obtaining purple dyes, a colour the author claims "...is never encountered, to my knowledge..." (p. 75-6). This cryptic comment is in conflict with evidence elsewhere in the book where Amsden notes historical aboriginal purples (p. 71) and what are also described as Hopi purples (p. 230). What we gain from a thorough reading of Amsden beyond the subject of purple is a significant reference on page 82 to lichens used as a mordant, a rare application also noted in Indonesia (see Hoffman 1997; lichens as mordants are recently included in Casselman 2000d). Here Amsden's source is the Franciscan Fathers of St. Michaels, Arizona, who in their 1910 ethnological dictionary and 1912 vocabulary of the Navaho language apparently make reference to lichen dyes. Amsden's legacy is diminished, however, because it is linked too closely to the misinformation trail. The problem occurs in Plate 39 where a lichen misidentified and misspelled as "*Parmelia molliuscula*" is interpreted by subsequent writers such as Grae 1974 as proof of aboriginal praxis. Even by the correct name of *P. molliuscula*, no such species occurs in North America according to Esslinger and Egan 1995. The genus in question is probably a species of *Xanthoparmelia* which Brough notes as a popular Navajo BWM dye. This book should be an important landmark in recovering the history of aboriginal dyes and dyeing in North America, but it is not. A revision of the contents could rightfully claim that status, but only if the lichen dye section is corrected and cross-referenced to Brough 1988.

Beriau, Oscar Alphonse. (1933). *La Teinturerie Domestique (Home Dyeing)*. Quebec City, Quebec, Canada: Department of Agriculture (Domestic Arts). Lalonger 1994 includes a 1980

edition published in Ottawa but she does not the Leméac 1980 facsimile, Montreal. In this thesis I identify issues of ethnicity and race in regard to prevailing Eurocentric interpretation of textile historiography (essay, p. 12). Consistent with my view in this regard is the extent to which Francophone Canadian sources (see also Soeurs de l'Ecole Ménagère Régionale de Sainte-Martine 1941) have been overlooked in favour of American sources (Furry & Viemont 1935) and/or British dye manuals (Mairet 1916). This original edition of Beriau illustrates my point. It is ignored by a French author who has written the only doctoral study on natural dyes in the last twenty years (Tievant 1979). Here is a manual almost 200 pages in length which is a comprehensive guide to indigenous and imported natural dyestuffs. Lack of quality is not an issue here, for the scope and depth of Beriau's work is certainly on a par with the most popular USA manual of the period, Furry & Viemont (who virtually ignore lichen dyes). Unlike the USA authors, Beriau includes numerous references to commercial AM lichen dyes such as cudbear (p. 26) and orchil (p. 26, 155, 167) as well as domestic BWM lichen dyes made from species of *Alectoria* (p. 14,21), *Cetraria* (p. 14, 20), and *Parmelia saxatilis*. Unfortunately Beriau falls into the misspelling trap with the rather amusing "Parmelia sexabilis" (p. 65) which derives no doubt from "sexatilis" in Hellot 1789. Dedicated to "the farm women of Quebec whose knowledge and growing interest in "the revival of household arts" has motivated his research, Beriau has by his own account recorded what he has observed all over the province: praxis that reflects the particular approach of an ethnic group. These are French Canadians whose own traditional ecological knowledge as well as their status as rural inhabitants has affected not only what they know about natural dyeing, but how they do it. (Compare CHG 1916). Beriau 1933 is an invaluable record of early modern praxis presented within an integral cultural context; the fact that the author was himself recognized as an important cultural facilitator surely helped to promote this manual within Quebec. That Beriau should be recognized by Mary Black in the 1980 edition of *The Key to Weaving*, and by the Burnhams in their 1972 study *Keep Me Warm One Night*, identifies and affirms the cultural recognition of this work in English Canada, a reputation it deserves here and elsewhere.

Born, Wolfgang. (1937). "Purple". *Ciba Review*, No. 4, p. 106-132. A lack of bibliographies and notes in the otherwise remarkable collection of articles contained in *Ciba Review* poses a problem for those who would base their historiographical interpretation primarily on sources

such as Born, Alfred Bühler and Alfred Leix, each of whom was a noted authority. Other than this technicality, there is much to be gained from a thorough reading of *Ciba Review*. In "Purple" Born examines the origins of murex within a zoological context complete with diagrams of *Murex brandaris* and *Purpura* spp. But although the hypobranchial gland is indicated in the illustrations by a very small 'p', there is no name attached to the organ in question. Every other organ is clearly identified including the anal orifice which may be why some sources remain uncertain about which organ is where (compare Herald 1993 and Sandberg 1997), or in Barber's case, avoid the anatomy altogether. Also included in this survey of purple dyeing is an illustration of the famous tombstone of the Roman dyer "C. Purpius C.L. Amicus" (p. 112); a discourse on how murex was made; a synopsis of Pliny's opinions on the subject; the smell of murex; the ritual significance of purple; the stunning Palmyra purples discussed as well by Sandberg in 1997; everything, in fact, *except* a recipe. Born's dramatic and embellished narrative contains gems, however; most significant in this regard is his statement that the "older interpretations of Pliny" support the view that "orseille was used to give a preliminary grounding" (ground colour) to murex-dyed cloth (p. 113). Moreover, Born provides an unusual perspective on traditional ecological knowledge when he confirms Pliny's claim that the excessive demand for purple necessitated the dilution of murex with orchil (*Ibid.*), an economic and ecological response to the over-exploitation of a natural resource.

Campbell Thompson, R. (1934). "An Assyrian chemist's vade-mecum." [See Prehistory - AD 1000].

Eaton, Allen H. (1937). *Handicrafts of the Southern Highlands*. New York: Russell Sage Foundation. (1973) New York: Dover Publications, Inc. [See also Eaton 1949]. The barest mention of lichen dyeing in this book serves to reinforce Fred Gerber's opinion described in *Lichen Dyes: A New Source Book*; namely, that lichen dyeing in Appalachia represents "a depauperate remnant" rather than fully-developed praxis. Further evidence is supplied by Furry and Viemont who include only the barest mention of lichen dyes when compared to Beriau in Canada; and Goodrich, whose 1931 book *Mountain Homespun* includes not a single mention.

What is of use in both of Eaton's informative and thorough surveys, however, is the detail he provides the reader who requires a comprehensive and relevant bibliography.

Furry, Margaret S. & Bess M. Viemont. (1935). *Home Dyeing with Natural Dyes*. Washington: Department of Agriculture Bulletin, Miscellaneous Publication # 230. [See also Adrosko 1971]. The 1971 republication of Furry and Viemont as one section of Adrosko 1971 has led to much confusion as to the origin of the original study. Although Furry & Viemont use a slightly more urbanized tone, this American *Home Dyeing* is in no way superior to Oscar Beriau's *Home Dyeing* published two years earlier in Canada. The Department of Agriculture imprint lends credence to their work, and it is certainly adequate for the time. The same can be said for Beriau's book which was likewise sponsored by the Department of Agriculture; but it was the provincial and not the federal department as in the case of the American publication. Furry & Viemont are much more like Ethel Mairet in that regard, for their work, like hers, is cited time and time again. I cannot dispute the veracity of the other dyes, but their brief lichen recipes are flawed by misinformation which due to the lack of a bibliography cannot be traced. (And yet when they describe a lichen dye tradition associated with the 'peasantry' of northern Europe, Mairet certainly comes to mind.) Furry & Viemont have *Peltigera*, a lichen which occurs on the ground, growing on "trees" (p. 23). Moreover, the "rose tan" (*Ibid.*) obtained using potassium chromate, a mordant now considered toxic (Casselman 1993a), is an example best not followed today. Also not recommended is the "buff" colour obtained from one peck of *Usnea florida* (p. 23). The persistent popularity of this book, like Mairet 1916, reinforces the perception that it is useful but the two lichen recipes certainly are not.

Grieve, 'Mrs' M. (Maud). (1931). *A Modern Herbal: The Medicinal, Culinary, Cosmetic and Economic Properties, Cultivation and Folk-Lore of Herbs, Grasses, Fungi, Shrubs and Trees With all Their Modern Scientific Uses*. Volume 1 & 2. Reprint of 1931 original. New York: Dover, 1974. Lichens are included in Volume 2 of this much-published book where later editions includes changes limited to the preface and indexes. Grieve treats lichens as 'herbs' which is an interpretation consistent with the early English herbalists such as Turner 1551 (see also Hakluyt 1600). Among common and vernacular names for lichen products Grieve lists 'dyer's weed' (see Stenhouse 1848), 'persio' (see Perkins 1986), and 'turnsole' (see Jaggard

1705). These common vernacular names provide evidence the author used a refreshingly diverse number of sources for her interpretation of the cultural, medicinal and economic value of lichens as pigments, medicines and cosmetics. Grieve supplies valuable evidence of another kind, however; considering the number of sources who describe orchil as a 'fraudulent dye' because they do not understand the role of lichen dyes in murex production, here we the surreptitious addition of products such as logwood (p. 493) to adulterate orchil itself. This is a significant and timely reminder that there were economic benefits to such combinations in the past. Grieve includes references to AM dye lichens such as *Roccella phycopsis* and *R. tinctoria* which I suggest are possibly among those species used today to adulterate hair dyes sold as 'henna' (Casselman 2000a; see also Barber 1999).

Hartley, Dorothy. (1939). *Made in England*. London: Methuen & Co. [See Hartley and Elliot 1926-1931]. As both writer and illustrator, Hartley's second publication on social history appears to contain information extracted from Hartley and Elliot, rewritten within a broader cultural context for a less-discerning audience. Her reference to lichen dyes (p. 225) is extremely brief, and yet she conveys that she has witnessed the praxis. "We went to see the dyeing expert," she writes, "who lives miles off." What follows is a description of Harris tweed, after which Hartley returns to the subject of dyestuffs: "This grey lichen is gathered...off rocks." (*Ibid.*) The author's next statement is qualified: "Of the dyestuffs I have *seen* in actual use I remember ...crotal and half a dozen or so bog plants." [KDC emphasis; *Ibid.*] Hartley makes a conscious effort here to distinguish herself from the "is said to yield" school of observation which is a detail helpful to the critical reader.

Huebner, J. (1934). "Early history of dyeing". In: F.M. Rowe & E. Clayton, eds. *Journal Society of Dyers and Colourists. Jubilee Issue*, p. 1-6. [See Edge 1914/15]. In this odd article Huebner analyses the Gaelic word 'lit' and speculates that "The word may have been derived from 'litmus' (*Ibid.*) or it may be an abbreviation of 'lichen'." (p. 6). He continues: "It is remarkable that the word 'lichen' has not been found in any of the records ... although the present author considers it safe to assume that lichens must have been the principal raw material for the supply of dyestuffs in Scotland in early times." (p. 6) What follows is a Victorian poem with over 200 lines in which every conceivable aspect of dyeing - from fleece

to pot to plant - is mentioned, except lichens. What records did Huebner survey? If he is referring to the literature in the Society of Dyers and Colourists library now housed at the Colour Museum, Bradford, then his statement is incorrect for I have seen this collection myself. That is where I studied Edge 1914/15 and Adam 1930; surely Huebner is referring to archival materials such as tariff records and customs (see Furley 1927). And if that is the case, the fact that he found nothing suggests confusion over dye names may be the reason why.

Hurry, Jamieson B. (1930). *The Woad Plant and Its Dye*. London: Oxford University Press & Humphrey Milford. This book is a benchmark against which UK specialists such as Jill Goodwin (1980) and David Hill (Hill 1998, Rutt 1772) measure the veracity of historical documentation and praxis relevant to woad; but Hurry's considerable value goes beyond woad. Hurry provides a rare 16th century orchil reference, one derived from the 'Statute of the Realm # 24 Hen. VIII & 4 Edw. IV.' (p. 48). "Fancy shades were obtained by the process of double dyeing, and apparently were not always reliable as appears by a statute passed in 1533 which ordered that none should dye woollen cloth as "browne, blewes, pewkes, tawnies or vyolettes" unless they were shotte with good and sufficient corke or orchall." (p. 48) This reference is of the utmost significance. It verifies the use of AM lichen dyes used in the commercial dyeing of madder and woad (compare Bemiss 1806). The 1533 statute also confirms the distinction between 'cork' and 'orchil'. This represents a significant differentiation, one that is not discussed by Kok, nor attributed in any other study in this thesis to Hurry's interpretation. Hurry alone identifies 'cork' as an indigenous AM dye and 'orchil' as a product based on imported lichens. Moreover, "orchall" is correctly spelled not only in the 1533 statute, but also in Turner 1551. Thus it is Hurry's scholarship which reveals the etymological link between that spelling and what becomes recognized as archel or archil in Britain. It is such insights that makes this a valuable reference, notwithstanding the opinion expressed by Carus-Wilson who in her classic 1954 study claims that Hurry is "historically unreliable." I find this claim unfounded in regard to lichen dye information of great interpretive value.

Mell, C.D. (1935). "Basic Dyes from Lichens". *Textile Colorist*, Vol. 57, p. 409-411. [See also Karr 1942, 1943]. Although dated, this article is more straightforward and useful today than are Karr's much longer contributions. Mell describes briefly the morphology of lichens,

and dyes such as archil, litmus and cudbear. Like Karr, Mell's text is highlighted by misspellings of *Parmelia omphalodes* and *P. saxatilis* (p. 411); furthermore, 'orchil' on page 410 is 'orchill' on page 411. *Umbilicaria* is barely recognizable as "Umbelcaria". Poor copy-editing seems to have occurred routinely in this American journal devoted to dye chemistry.

Smith, Joe. (1934) "Recipes for Natural Dyes." Saint Francis Xavier University Archives, Antigonish, Nova Scotia, RG 30 /30/324. (Although the recipes make reference to a "chart" of dye samples, these appear not to have survived.) Other than the fact he lived at "Margate" (near Kensington, Prince Edward Island), little is known of Mr. Smith. The recipes that bear his name are more comprehensive than most in this period (compare Stronach 1940). "I am not sure of their names", Smith writes in reference to lichens; but he includes several genera such as *Cladonia*, *Usnea* and *Sphaerophorus*. It is remarkable that aside from *Lobaria*, the names included here are correctly spelled. The importance of the Smith material is that it documents a tradition that survived in rural Atlantic Canada. In Smith's case, speculation as to the origin of his considerable personal knowledge (broader in scope than is Stronach's) is tantalizing; the lack of the word 'crottle' here suggests to me that Smith is Scottish in origin. Was he married to an Acadian, a rugmaker perhaps, one familiar with the Quebec work of Oscar Beriau (1933)? And was Joe Smith aware of the 1916 Canadian Handcraft Guild booklet with lichen dye recipes? A colleague has told me this document was first published in English by the Prince Edward Island Women's Institute (Pers. com. S. MacDonald, 1998). To know more about Joe Smith and his interest in lichen dyeing would identify in Atlantic Canada a practice which may be a rare example of a non-Scottish tradition.

Thurstan, Violetta. (1930?) *The Use of Vegetable Dyes for Beginners*. London: Dryad. A 1993 biography of Thurstan (*Violetta Thurstan - A Celebration*, Penzance, Cornwall) written by Muriel Somerfield and Ann Bellingham, members of the same guild to which Thurstan herself belonged, sheds no light whatsoever on the confusing history of this dye manual which the biographers claim to have been printed first in 1930. A variety of typographical errors in the biography are reason for a lack of certainty on my part. As in the case in my annotation of Mairet, what follows here are citations *as they appear* in the source cited: Dryad n/d, "Leicester" (Davenport 1955); Dryad 1929 (Davidson 1950); Dryad 1936 (Kierstead 1950);

Dryad 1968 "Leicester" (Wickens 1983); Dryad 1968 (Grierson 1986); Dryad 1970 (Casselman 1996c); Reeves-Dryad 1975 "Leicester" (Goodwin 1980); Reeves-Dryad 1977 (Lock 1981); Dryad 1988 (the most recent edition). If most of these imprints are valid then Thurstan shares with Mairet a distinction as to the most widely-available dye book of all time. Given this remarkable chronology it is surprising that Thurstan's modest book (which in its present form contains 48 pages) is only slightly more comprehensive than Furry & Viemont 1935 with which it is often compared. But Thurstan's lichen dye information surpasses what is contained in all other sources of this period with the exception of Mairet. Notwithstanding Thurstan's misspelling of the Rucellai family name (p. 29), she reaches into history and hints at the scope of the subject of lichen dyeing. Moreover, in contrast to Mairet whose crotches were to some extent dyed by Valentine KilBride, a practitioner can see evidence of empirical knowledge here. Moreover, Thurstan does not make Mairet's mistake and apply AM dye names to BWM dyes. This author realizes that "*Ochrolechia tartarea* [was] formerly *Lecanora tartarea*" (p. 30) which suggests a sophisticated approach to dyeing as education, one consistent with a woman who was an advisor to the Egyptian government on Bedouin weaving, a restless traveller, and according to her biographers, a person whose life and work rivalled Ethel Mairet's. I am tempted to agree; and suggest that it is time for a more cogent and comprehensive study of the life of Violet Anna Thurstan who chose to be the more poetic 'Violetta'.

1940-1949

Briggs, Rose T. (1941). "**Notes on Vegetable Dyeing**". Plymouth, Ma: Plymouth Antiquarian Society. Available until 1971 (date of the Fourth Reprint), the value of this modest pamphlet is limited to the actual samples of dyed, handspun wool drawn through holes punched along the edge of the back cover. Although one of these swatches is labelled "lichen", no species is named, nor is a recipe given. [Compare Sister Mary Ann Hills 1857]. With the insertion of a single Latin name, what is a memento could have been a valuable addition to the USA documentation of this period.

Bryan, Nonabah & Stella Young (ed). (1940). *Navajo Native Dyes: Their Preparation and Use*. Indian Handcrafts Pamphlet # 2. Lawrence, KN: US Bureau of Indian Affairs. [See also

Amsden 1934; Brough 1988]. Young's name only is generally cited in books that include this much-published work. Other imprints include: Palmer Lake, CO: Filter Press, 1978; New York: AMS Press, 1979; and (as *Navajo and Hopi Dyes*) Salt Lake City, UT: Historic Indian Publishers, 1988. This book is a signpost along the misinformation highway whereby the orange BWM dye from the lichen "*Parmelia molluscula*" passes from Amsden 1934 (who has another version of the name, also misspelled, but in a slightly different manner). The persistent popularity of Bryan and Young mean that "*P. molluscula*" will continue to find its way into books such as Grae 1974 and Gucciardo 1981 where its presence demonstrates the lingering legacy of a small error made larger over time. The mistake *per se* is not the issue here, but the result contributes to an already confusing historiography.

Collister, Joan. (1944: October 14). "Strides Taken by Handcraft Industry." *Halifax Daily Star*. Public Archives of Nova Scotia, Reel 8253. Although Mary Black indicated to me in the early 1980s that she once had a considerable interest in natural dyes, I was unaware of her 1940s experimentation. [See Stronach 1940, 1942]. Black is quoted in this article as having made dye tests at a weaving class St. Ann's Gaelic College (South Haven, Cape Breton Island), where she used "bayberries and the parasite crotal". Black was correct in interpreting lichens as to some extent parasitic upon other lichens. Moreover, she was also correct in identifying the value-added possibilities of lichen dyeing in domestic economies where those who were unable to work away from home, took up weaving. [See also Purkiss 1927]. This same philosophy also identified USA craft initiatives of the time, as indicated below.

Eaton, Allen H. (1949). *Handicrafts of New England*. New York: Harper & Brothers, 1949.[See also Eaton 1937]. The single reference to dyes in this book is noteworthy due to the context of social reconstruction. The "Bridgeport Project" conceived by manager William H. Ham (p. 93- 95) enabled low income tenants to earn their living at home, weaving and dyeing. Although Eaton does not attribute this initiative to a Scottish model, Lord Leverhulme's Hebridean projects in developing home-based Harris tweeds were similar in focus. Also similar in concept were Appalachian projects such as the Allanstand Cottage industries of Frances Louisa Goodrich, but in her book *Mountain Homespun* [1931] there is no indication whatsoever that lichens were among numerous dyestuffs used there. The paucity of North

American references in this regard underscores the value of Eaton in this regard, and also provides a philosophical link to Mary Black's work in Nova Scotia.

Karr, A.E. (1942, 1943). "Lichen Colors." *Textile Colorist*, # 64 (Part 1, p. 431-436) & # 65 (Part 2, p. 74-85). There are few articles on the subject from this or any other period that are more disjointed or so full of typographical errors (e.g. "Rocella", p. 433, Part 1.) It is impossible to discuss Karr without first reading Mell 1935 who stays within the topic of his article compared to Karr's lack of focus. The author provides an exhaustive list of the geographic distribution of certain species (*Ochrolechia tartarea* occurs in the Arctic and Antarctic, or so he claims) but the frequent misspellings cause one to question the veracity of the data itself. There is folkloric detail here: in Galway, Ireland, *Ramalina scopulorum* is apparently known as 'Scaith Cloch' (p. 76). Karr's analysis of "crystallized orcein" (p. 434) is frustratingly incomplete; his orchil method involves pre-cooking the lichens *before* exposing them to ammonia, an unusual methodology that does not translate to the usual craft methods (Appendix 1). This article is of limited use to the craft dyer seeking clarification of cultural practice. Moreover, in Karr's two hundred item bibliography, Mell is conspicuously absent.

Kontturi, Hulda. (1947). *Luonnonväreillä Värjäämisestä. (Dyeing with Natural Colours.)* Fifth revised printing. Helsinki: Pellervo-Seura. This once-popular Finnish book includes only BWM dyes, particularly those made from *Cetraria islandica*, *Parmelia saxatilis* and *Usnea barbata*. The use of Latin names (not only correctly spelled, but accurately translated) is perhaps due to the academic background of the author who did graduate work in textiles.

Lawrie, Leslie Gordon. (1949). *A Bibliography of Dyeing and Textile Printing: Comprising a list of books from the sixteenth century to the present time.* London: Chapman & Hall. There are few bibliographies on dyeing, which Lawrie addresses in his preface: "While it would not be true to say that there existed no bibliography relating to the subject of dyeing...those lists which have been compiled contain relatively few entries and are mostly out of print and difficult to obtain for reference. The art of dyeing does not," Lawrie notes, "possess anything in the nature of a comprehensivelist of books published since the beginning of printing to the present time." Lawrie's work is arranged alphabetically (100 pages), and also

in chronological order (30 pages), providing researchers with quick access. But in this valuable reference book which is rarely cited, I note important discrepancies. One is the inclusion of *Plantae Tinctoriae* attributed erroneously to Linnaeus. (Smith 1921 makes the same mistake.) I also note that Hoffman 1787 is included in Lawrie's list, while important 19th century British references are not. Why does Lawrie exclude Lindsay's *A Popular History of British Lichens* (1856)? This is not the only account available at the time of Lawrie's research, but the best one that describes the little-known 19th century Norwegian-English trade in lichens, a trade that profoundly affected the production of industrial European AM dyes. What explains this discrepancy, the inclusion of Hoffman 1787 and Linnaeus 1760 which are rare by any definition, and the exclusion of Lindsay, a book that is so widely available today it is in most university libraries in the UK and elsewhere (i.e. University of New Brunswick, Fredericton, NB)? There is a considerable irony in the fact that in my experience one is far more likely today to come across Lindsay 1856 today, than they are Lawrie's 1949 bibliography.

Leechman, Douglas. (1945). *Vegetable Dyes from North American Plants*. Saint Paul & Toronto: Webb Publishing Co., & Oxford University Press, 1945. There is also a 1969 edition published by The Southern Ontario Unit of the Herb Society of America. One of the few sources I have included that contains no information whatsoever on lichen dyes, Leechman's work is considered a classic study. Brough 1984, 1888 and Turner 1979 provide evidence of aboriginal lichen dyes from the northwest and the south. The fact that there is so little from central and eastern Canada raises the question as to why Leechman did not include any such references in this extremely popular book in print for more than thirty years? I wrote to Dr. Leechman in 1976. His reply (dated August 26, 1976) advised that he was a National Museum staff anthropologist and that ethnobotany fell within his field. Although he did not answer my query directly, Leechman said he investigated "native food plants, glues, cordage and so on," but that his work on those subjects was "not yet published." Another reason for including Leechman 1945 is to avoid its being used as evidence that aboriginal societies in Canada did not use lichen dyes, a claim no longer supportable in light of Isham 1743. Deleted of its racist language, a 1932 article by Leechman first published in the *Transactions of the Royal Society of Canada* (Vol. 26, p. 37-42) is reprinted in an abbreviated form in Schetky 1964 as a fairly obvious attempt to assure ethnic inclusion. There are no lichen dyes in that work either.

Leggett, William F. (1944). *Ancient and Medieval Dyes*. New York: Chemical Publishing Company. [See also Leggett 1949.] This is a treatment that now seems very dated. The author plays with quotations to tantalize the reader, yet provides no footnotes for further research. One example is the claim that 'orseille' when fresh yields a colour "...so beautiful that it even excelled the ancient purple of Tyre," which Leggett attributes not to Theophrastus, nor to Dioscorides, but to *both*. No page references or specific editions are included in his bibliography. Leggett's entry for cudbear is inexplicably reduced to a single sentence (p. 60). Leggett cleverly includes a sufficient number of quotes to maintain interest including a charming one which he attributes to George Eliot's *Ramola*: "...a little lichen which grows on a rock, and, having drink a great deal of light into its little stems and button-heads, will give it out again as a reddish-purple dye, very grateful to the eye." Here he contributes to the misinformation trail (see Lock 1981, Walton 1757) that is a lingering problem.

Leggett, William F. (1949). "Lichens As Dye Plants." *Journal New York Botanical Gardens*, Vol. 50 (May), p. 107 -110. [Compare Edge 1914, 1915; Llano 1944.] Leggett uses his brief lichen section (above) as the basis of this footnoted article. In fact he uses the exact same murex quote (... "so beautiful...") which in this article he attributes specifically to Theophrastus. The accompanying footnote does not lead the reader to a specific edition of Theophrastus, but at least it provides the mollusc species names *Murex brandaris* and *M. trunculus*. I admit there is more research here than in Leggett's book. For example, Leggett applies the name 'orchilla' specifically to "New World dye lichens" from "the coast of lower California" [see Hale and Cole 1988], a mid-19th century trade known to few (Perkins 1986). The greatest value here is when Leggett mentions Woodward's then-forthcoming "notes" [see Woodward 1949] which remain one of the most valuable sources in this thesis. But the legacy of Leggett's convoluted style of writing has contributed in to the confusion that plagues the subject of lichen dyes. His entry for 'perelle or pabelle' is another example: "Pabelle, derived from the French, is used for *Lecanora parella*, which yields principally a red or crimson dye often used in the preparation of orseille." (p. 110; see also Dallon 1997).

Llano, George Albert Perez-. (1944). "Lichens - Their Biological and Economic Significance." *The Botanical Review*, Vol. 10 (1), p. 1-65. One copy of this article, inscribed

by Llano as "bound Gotland, 1947" is in my library, accompanied by a 1993 letter in which the author describes a subsequent, revised version published in *Economic Botany*, Vol. 2 (1), p. 15-45. (See also Llano 1950, 1951). A five page dye chart relevant to lichen pigments of Europe and Asia, supported by a two hundred item bibliography, make this article required reading for those who need a biological foundation for economic uses in pre- and post-war Europe. Particularly cogent is Llano's discussion of the preparation and manufacture of cudbear. I would disagree, however, that BWM dyes used in the Harris tweed industry were made into balls (p. 44), wrapped in docks leaves, and thus hung to dry over a peat fire which is a technique elsewhere described as reserved for AM dyes (Edmondston 1844; Grierson 1986; Lindsay 1856). It should be noted that after the publication of this major article Llano dropped the ethnically-particular "Perez-Llano" from his surname. (See my essay, p. 11-12.)

Shaw Campbell, Margaret. (1947: February). "Hunting Folksongs in the Hebrides". *National Geographic*, p. 249-292. (See Margaret Fay Shaw 1986; Sharnoff & Sharnoff 1997). This article is remarkable on several counts. It is possibly one of the last first-hand accounts of Hebridean tweed-making where the author was in a position to validate by her presence as an observer, *in situ*, the spinning, dyeing, weaving and waulking a length of cloth (see Richardson 1975). This cloth was hers, subsequently, to use and wear. (Modern day customers return later in the week to receive their bundle of handspun, hand-dyed and handwoven fabric which may or may not have been made on site: see my annotation of MacKay 1976.) Conspicuous by their absence here are references to lichen dyes beyond the cursory mention (p. 253). A current edition of Shaw 1986 compensates for the botanical shortcomings of the post-war folkloric tradition by including helpful Gaelic-English translations.

Soeurs de l'Ecole Ménagère Régionale de Sainte-Martine. (1941). *Teintures Végétales: Extraits des plantes de chez nous. (Plant Dyes You Can Make)*. Montreal: Les Presses de l'Institut des Sourds-muets de Montréal. [See Beriau 1933; Smith 1934]. Sister Marie-Alphonse d'Avila is credited with the initiation of this rural outreach program at Sainte Martine, south of Montreal, Quebec, where she was in the regional Home Economics department. The project was inspired by Henri Pourrat, "a lucky man...of unfailing wisdom who has gathered together these simple recipes from nature." The book contains a preface by Abbe Albert Tessier

who apparently sanctioned the Sainte Martine program. Here natural dyeing is work that will remind young people of the "artificiality of the present century". It presents the view that textile skills link nature to the "measured rhythms of a calm life", and is in that regard similar to the philosophy of Stronach (below). Unlike Beriau, there is no attempt here to include botanical nomenclature. Lichens are described instead by their vernacular French name; thus *Lasallia* and *Umbilicaria* (no distinction is made) are "tripe de roche". There are simple methods for BWM dyes based on a varying ratio of 1:1 (lichen to fibre) to 3:1 (see Gerber & Gerber 1969). One troublesome recipe in this book suggests to me a lack of empirical knowledge in regard to the AM dye which produces a "coral" colour (p. 79) without using ammonia. The formalized publication of this 137 page book by the Institute of Deaf Mutes Press assures its place among the more unique contributions to dye historiography in Canada.

Stronach, (Mrs) May D. (1940?) *Mrs. Stronach's Dyes. "From a book loaned to Martha Finlayson at the Festival of the Arts 1974 by Fred Aster of Halifax."* [There follows this note on the title page: "Original notebook had Troy J. Anderson, 815 W. Walnut Street, Springfield, Mo."] This pamphlet was given to me during the 1980s possibly by Dawn MacNutt, Dartmouth; attempts to reconstruct its history have been unsuccessful. It is impossible not to compare this document to Smith 1934, and see that the latter has more value. An analysis of the contents here shows these recipes to be inadequate as a set of instructions. Perhaps these notes represent a skeleton of something Stronach planned to develop further. It is simply a recounting of her own intuitive methodology. Two of the recipes feature "Old Man's Beard", but I suspect Stronach's "light...brown" result is attributable more to the excessive mordants she appears to have used than it is to the lichen itself. In another 'beard' recipe (presumably *Usnea* spp.) the volume of lichen used - 4 pounds - is as extravagant as Van Stralen's. This document does not communicate empirical knowledge nor practical tips. Its value is as a cultural indicator, one that links Stronach's approach to informants included in recent scholarly accounts (Carlson 1997) which are characterised by a pervasive vagueness in regard to lichen dyeing. Joe Smith of Margate, PEI (Smith 1934) provides more than Stronach and Carlson which suggests this may be a 'secrecy' attitude whereby details are omitted as protection against competition or challenge. It is ironic that Stronach's origins are vague as well. She is described in the *Mail Star* obituary (January 12, 1963) presumably by her sister, at whose Toronto home

she died, as from "England". But Eveline MacLeod (see Carlson 1997) told me Stronach was born on the Outer Hebrides (pers. com. South Haven, Cape Breton, December 8, 1998).

Stronach, May. (1942). "Weaving in Nova Scotia". Lichens dyes are not included in this paper May Stronach presented to the 1942 Antigonish Handcraft Conference organized by Sister Anselme (now Sr. Irene Doyle). It is included here to demonstrate spheres of influence in regard to cultural practices. Stronach's comment on natural dyeing as "work suitable for women and children" raises questions of gender and labour. This view also reinforces problematic views of Hebridean lichen gathering. (MacLean & Carroll 1985; Sutton & Carr 1980) On balance, however, Stronach's words reinforce the gender specificity of the activity which is often misappropriated.

Viner, Wilmer Stone and H.E. Scrope Viner. (1946). *The Katherine Pettit Book of Vegetable Dyes*. Saluda, NC: Excelsior. Among the lichen dye recipes included in this under-valued book are three that suggest a relict Scottish tradition in Appalachia first described to me by Fred Gerber, and also noted in my annotation of Furry & Viemont 1935. *Ramalina scopulorum* (p. 31) is one clue, while "crottle" as the correct name for *Parmelia omphalodes* is another. The lack of recipes [see Briggs 1941] underscores the extent to which the 'mysterious' lichen dyes process was perceived to be beyond the skill of the novice dyer. Even these barest of mentions, however, shed light on Gerber's opinion as to the virtual absence of lichen dyeing in a region of the United States where dyeing remained actively practiced into the present century. This makes Viner and Viner a more valuable book than Furry and Viemont in regard to this thesis, and one that deserves far more attention.

Woodward, Carol. (1949). "Vernacular names for *Rocella*." *Bulletin of the Torrey Botanical Club*, Vol. 76 (4), p. 302-307. This is the only reliable source available for the etymological derivation of *Rocella*. The lack of a bibliography here is partially overcome by footnotes that describe how the author came to investigate the etymology of the lichen genus and the family name from which it derives. Her primary source was G. Marcotti's *Un Mercante Fiorentino Giovanni Rucellai, e La Sua Famiglia Nel Secolo XV* which Woodward describes as privately printed in Florence in 1881. Marcotti is also cited by Kok 1966 & Perkins 1986

but we know less about their access to the book than we do about Woodward's. She saw it at the New York Public Library where a copy was deposited by "an American vice-consul in Florence" who "once asked that a privately printed book which he had seen in Italy, be presented to the Astor library." (p. 303) This history of the famous Rucellai family of Florence enabled Woodward to interpret the orchil narrative. It also raises an important question in regard to the orchil 'discovery' story. Can we continue to regard orchil as the first mass-produced lichen dye in light of the growing body of evidence in support of an indigenous dye tradition that predates Florentine orchil by centuries? (See my essay, p. 12.) For if the AM dyes of the Bronze and Iron Age described by Taylor and Walton are derived, as they suggest, not from *Rocella*, but from indigenous northern lichens such as *Ochrolechia* and/or *Umbilicaria*, then the historiography of lichen dyes must be rewritten. This new interpretation, however, will in no way diminish the value of Woodward 1949.

1950- 1959

Carus-Wilson, Eleanora M. (1954). *Medieval Merchant Venturers*. London: Methuen. The significance of the cloth trade in the medieval period strongly suggests that economic historians must recognize the indigenous trade in AM dyes identified by Furley 1927 and Hunt 1995. Carus-Wilson is almost alone in this regard which is likely why this book is in the bibliography of Kok 1966. On page 220 Carus-Wilson includes lichen dyes with the claims that "Many varieties of lichens...were probably used, and it seems likely that there was already an import of these from northern Europe." The author continues: "orchil or archil (also called 'cork'), a lichen dye which gave a purplish red, was being imported from Norway by the early fourteenth century." (p. 220) Carus-Wilson devotes an entire chapter to Norwegian-English trade; the text is heavily noted, consistent with her reliance on archival sources. But conspicuous by its absence, is a footnote for the lichen dye mention. What the author has done in this case is exactly what Kok did herself, express an opinion which cannot necessarily be supported in the form of a specific document, yet one that is surely the kind of 'hunch' scholars yield to from time to time. Carus-Wilson is included in my thesis for another reason, and this is due to her lively and useful account of the status and role of the medieval dyer. According to the author

the very first admission to the guild merchant roll for Leicester in 1196 was "a dyer, Nicolas Tincture" (p. 223). Her attention to such details provides a valuable socioeconomic and cultural context for dyeing and it also suggest other books that should have included the subject. For example, in *Peasants, Merchants and Markets : Inland Trade in Medieval England 1150-1350* (New York: St. Martin's Press, 1977), James Mescal examines toll books and identifies Southampton as a major centre for the import of dyestuffs (p. 117-188). But among the dyestuffs he mentions there is not a single reference to orchil, an interesting omission in light of Furley's documentation of cork as an import item. Eileen Power's *The Wool Trade in English Medieval History, Being the Ford Lectures* (Oxford University Press, 1939) includes numerous references to Norse trade and yet there is not a single mention of dyestuffs. Another source that is focused on the links between Scotland and Scandinavia ignores not only dyes, but even textiles. Editor Grant E. Simpson's *Scotland and Scandinavia, 800-1800* (The Mackie Monographs I; Edinburgh: John Donald, 1990) is a glaring example with an index that includes neither cloth nor any reference whatsoever to a trade in dyestuffs, products now known to have been significant in that regard (Høag 1976, Høiland 1983). And finally, Carus-Wilson's lack of a citation for her mention of the Norway-England lichen dye trade, as important and uncommon a reference as it may be, does raise a question of academic propriety. When Carus-Wilson makes a statement to the effect that J.B. Hurry is "historically unreliable" (p. 216), she casts doubt on a classic source (Hurry 1930) that others find to be carefully amplified in that regard, and of incomparable value to the subject of this thesis.

Clow, Archibald and Nan Clow. (1952). *The Chemical Revolution*. London: Batchworth. This book is of considerable value as the comprehensive footnotes provided lead the student of lichen dyeing to little-known sources such as Logan 1833 and O'Curry 1873. It was from Kok 1966 that I first learned of the Clows' treatment of cudbear and the Gordon family, a well-developed narrative that provides the discriminating reader will more detail than most accounts. This book is valuable as a reminder that the chemical, economic and industrial history of the British Isles is incomplete without the inclusion of cudbear, a point missed in a number of studies that treat the economic history of Scotland without recognition of the role of dyestuffs in industry and commerce.

Davenport, Elsie. (1955). *Your yarn Dyeing*. Pacific Grove, CA: Craft & Hobby Book Service. Other editions include the 1953 Sylvan original (London?) and a 1961 US edition by Select Books. Notable in this classic dye manual is Davenport's opinion that the "...fugitive reds and purples were not obtained from native lichens..." (p. 123). Unfortunately, a fuller context is not provided for this curious opinion, one which would appear to deny an awareness of Mairé and Thurstan's work. Davenport acknowledges the Keeper of Botany at the British Museum for assistance with lichen identification, and she includes as well a list of thirteen dye species (p. 121-123). Among these is "*Lecanora tartarea*" (*Ochrolechia tartarea*) about which Davenport claims there is "no firsthand information available." That one reference, and her reliance on the "is said to yield" method of lichen dye citation, not to mention a magenta dye from dandelion, throws into doubt the veracity of much of the information contained in this book which is a mainstay in guild libraries worldwide. That this book was more highly regarded than Thurstan in the 1970s when I was a student, will perhaps be rectified when more researchers analyze the contents within a botanical and cultural context.

Davidson, Mary Frances. (1950). *The Dye-Pot*. Gatlinburg, Tn: privately printed. The author of this beloved classic reprints the book on a regular basis and signs her name and an inscription inside every copy. (One of my several copies read, "A weed does not die in vain if it dyes.") The value of the contents has also been enhanced in recent years by the addition of a comprehensive bibliography, a glossary and an expanded index, all encouraged by the author's friendship with Jim Liles. These revisions highlight problems, for while Davidson includes Bolton's 1960 *Lichens for Vegetable Dyeing* in the post-1980 editions of her bibliography, there is not a single reference to lichen dyes in her text. (The author was also a colleague of Fred Gerber.) This book illustrates what the Gerbers identify in 1969; there is an apparent lack of empirical knowledge in Appalachia in regard to lichen dyes. It also reminds us that although commercial lichen AM dyes were used in post-colonial America (Hills 1857, Rambo Walker 1840) there is a lack of evidence of BWM dye practice in regard to the empirical knowledge of well-known teachers such as Mary Frances Davidson.

Kierstead, Sallie Pease. (1950). *Natural Dyes*. Boston: Bruce Humphries Inc. This book is included here for several reasons. It offers a comparison to Davidson, which in my opinion it

exceeds in value. Kierstead's inclusion of lichen dyes is one mention of a BWM tan from unknown species, although the author provides on page 79 suggestions on how and when lichens are collected. Given the inclusion of Mairet and Thurstan in her bibliography, I suspect these UK sources were mined for this 'harvesting' information of no value without a context. Lack of empirical knowledge is one thing, but veracity becomes an academic issue when in a 1991 bibliography that includes at least one thousand references, Barber includes Kierstead as the sole dye manual. Under most circumstances such an inclusion would underscore the value of a book. In this case, it raises a question of judgement.

Llano, George A. (1950). *A Monograph of the of the Lichen Family Umbilicariaceae in the Western Hemisphere*. Navexos P-831. Washington, DC: Office of Naval Research, Department of the Navy. This published and illustrated version of Llano's PhD thesis is the definitive work on the subject. Dyers intent on learning about AM species will find this publication of use once they have familiarized themselves with the subject by reading Richardson 1975, followed by Hale 1979. Llano's monograph is a classic treatment for studies in greater depth; and it is still available at university and herbarium libraries.

Llano, George A. (1951). "Economic uses of lichens". *Smithsonian Institution Annual Report 1950*. Washington, DC. P 385-421. A shorter version was published in *Economic Botany*, Vol. 2 (1), 1948, p. 15-45; see also Llano 1944.] There is no comparable article on the economic aspect of lichens that offers more historiographical detail on dyeing. Llano's treatment includes information that is simply not found elsewhere. What I have included here is not a synopsis, but points that relate in particular to issues raised in this thesis. For example, Llano includes an incomparable first-hand account of Hoffman 1787 and Westring 1805, descriptions on page 406 that motivated me to locate these rare books. In regard to ethics, Llano provides his first-hand observation of Swedish praxis which involves a 4:1 lichen to fibre ratio (p. 419), disproportionately large by today's standards but a useful comparison to illustrate improved methods. We are also grateful to Llano for his sense of lichen dyeing as a vanishing phenomenon in the Outer Hebrides circa 1940 and the cryptic response received from the industry when he queried them on the extent of practice circa 1945. A vigorous discursive style of writing allows Llano to include Woodward's very important paper which he juxtaposes

with his own opinions in such a way as to reinforce the research contained in both.

McClintock, Henry Foster. (1950). *Old Irish and Highland Dress and That of the Isle of Man*. Second and enlarged edition; with chapters on Pre-Norman Dress by Rev. Professor F. Shaw, and on Early Tartans by J. Telfer Dunbar. Dundalk: Dundalgan Press. [See Dunbar 1962]. Originally published in 1943, this little changed edition is written in the earlier and dated style of J.G. MacKay's *The Romantic Story of the Highland Garb and the Tartan*. The comparison ends there. While MacKay 1924 provides sufficient lichen dye references for analysis, McClintock barely touches the surface of the subject. In his nine page discussion of saffron there is a vague mention of 'rock-moss' or 'crotal' on page 69. A single reference to lichen dyes in a study of this scope raises questions. Is McClintock unaware of Rutty 1772, or more modern sources such as Boland 1904? Does his omission of lichen dyes suggest that McClintock only had access to confusing sources such as Hart 1898? The fact that the author offers a lengthy critique of various aspects of O'Curry suggests to the contrary that McClintock, a scholar of note, had broad historiographical access and a strong bias. To discuss at length red and purple colours in regard to 'old' dress and costume, without a single mention of AM lichen dyes, underscores the problems identified in my essay.

Origo, Iris. (1957). *The Merchant of Prato*. London: Jonathan Cape Books. When the subject of medieval orchil is discussed, invariably this book is presented as evidence, but precisely in support of what? Of the merchant family whose fortune was so entwined with their product that their name, Rucellai, that they came to be forever identified with the orchil lichens *Roccellae*? Of the Florentine industry in general? Even Kok and Perkins include this book in their bibliographies, as does Tievant 1979. In my case, a reading of the text impresses upon me the questionable value of two cryptic orchil mentions on page 67 and page 97. Certainly there is in this study a sense of the period; an historical context for textile trade; and, in my opinion, little else relative to lichen dyes. That too few studies pay more than passing attention to orchil as indigenous industry and/or trade, is disappointing. To perpetuate this book's popularity in future studies is not my reason for including it; instead I see it as a prime example of a study that might have illuminated Florentine orchil, but one that clearly does not.

Solberg, Yngve Johannes. (1956). "Dyeing of wool with lichens and lichen substances." *Acta Chemica Scandinavica*, Vol. 10, p. 1116-1123. [Compare Sheshadri 1966]. No other single article from the mid-century provides a better overview of the subject of lichen dye chemistry covered in later books such as Culberson 1969. The language used is technical, but accessible to page 1119; beyond that it will be of use only to readers with a chemical background. Table 1 demonstrates the relative amounts of depsides and depsidones contained in certain genera. I would disagree that the species chosen are in all cases effective as dyes. Furthermore, by including four species of *Usnea*, Solberg unintentionally perpetuates the mythology surrounding this genus as a source of unusual dye colours. The value of this contribution is slightly diminished by my recognition of the gap here between dye chemistry and empirical dye knowledge which in this case appear to be distinct and different areas of expertise.

Wallis, Wilson Dallam and Ruth Sawtell Wallis. (1955). *The Micmac Indians of Eastern Canada*. Minneapolis: University of Minnesota Press. There is a perception that aboriginal peoples are consistent in cultural terms; that their textiles, and by extension, their dyes, are similar. Moreover there is a perception that aboriginal use of lichen dyes is wide-spread. Brough 1988 and Turner 1979 indicate this is certainly not the case. As I note in Rosenberg 1752, mid-18th century BWM dye mentions in European literature are scarce indeed, a fact that underscores the considerable cultural value of indigenous North American references such as Isham 1743. Studies such as this one by Wallis and Wallis could help; for as one authority on Micmac material culture has recognized, we have no such evidence of lichen dye use. (pers. com. Ruth Holmes Whitehead, Halifax, 1993-1995.) Nor do Wallis and Wallis include lichens in their section on dyes (p. 87-88). But when she suggested I consult this book, Whitehead (who states unequivocally that she objects to the Eurocentric bias in the text, as do I) was by her own admission hopeful that I might find a clue among the four lichens included as "moss and/or lichen" on page 504. No such epiphany occurred. Was such a wish realistic, given confusing citations that read as follows: "kuwas'aumana'ksil, literally, 'old moss long stem' " (p. 509)? Challenges of translation are noted in this thesis, as are the inherent obstacles of the cultural value system and bias of the observer. But some effort to render this treatment more meaningful by having the words translated not literally, but conceptually, would have been more useful today to Mi'-kmaq peoples and those who study their culture.

1960 - 1969

Bolton, Eileen Mary (1960). *Lichens For Vegetable Dyeing*. London: Studio Books, Longacre Press. [See also Bolton 1991]. For twenty years I have enjoyed finding references to various editions of this book. Some of the confusion surrounding later editions can be partially clarified by describing those in my personal library. What I do have is a copy of the original Studio edition, and the 1972 London reprint by Studio Vista Publishers. I also have the first American edition published in 1960 by Charles T. Branford (Newton Centre, Mass.), an imprint that is neither acknowledged or credited in a subsequent 1972 American reprint by Robin and Russ Handweavers (McMinnville, Or.). This oversight was rectified in their own imprint of a revised 1991 edition. A number of bibliographies in dye manuals include printings that research cannot substantiate: these include London 1963 (in Fraser 1983); Brooklyn Botanic Garden 1973 (in Sauvé 1977). Acknowledging the assistance of the leading authorities of the period, including Peter James and Mason Hale (see Hale 1979), Bolton was prescient in her comprehension of lichen dyes as a study of botany and chemistry. A practitioner of considerable skill, she made the dyes she describes. This is the context within which I analyze her perception of POD dyes as a distinct methodology which in this original edition Bolton claims to have 'discovered' herself. There has long been a debate over the watercolour illustrations in this book; some claim they are too fanciful to be useful but I relied on them for years. The legacy of Bolton's pioneering work to identify and recognize the ethnicity and cultural value of lichen pigments, and reclaim that history, is acknowledged worldwide. Evidence of this fact is the regularity with which Bolton's work is included today in the bibliographies of books on many subjects, written in languages that range from Indonesian to Icelandic. This thesis is a testimony to her success as a pioneer, a marginalized autodidactic scholar who was little-recognized in her own time and place (see Casselman 1992d, 1992e).

Culberson, Chicita F. (1969). *Chemical and Botanical Guide to Lichen Products*. Chapel Hill, NC: University of North Carolina Press. (See also Culberson, Culberson and Johnson 1977). This technical study of lichen products or substances is invaluable to the lay reader who wishes to learn more about the subject. For example, *Ochrolechia tartarea* contains gyrophoric acid, as do umbilicates such as *Lasallia papulosa*. This distinction is pertinent to

the usefulness of specific species in dyeing which in the case of *O. parella* is a point made by Grierson 1986. This book remains essential reading for those who require a biochemical context for dye-producing lichens.

Dunbar, John Telfer. (1962). *History of Highland Dress; a definitive study of the history of Scottish costume both civil and military. With an appendix on early Scottish dyes* **Annette Kok.** Edinburgh: Oliver & Boyd. Few who rely on Kok's 1966 study of orchil know of this earlier work possibly because there is more attention here on BWM dyes. This study is a suitable compliment to her 1966 paper in which the author is focused exclusively on AM dyes such as orchil and cudbear. The appendix is comprised of an analysis of several earlier dye studies, including Maclagan 1898, which Kok attempts to verify or refute according to her own dye tests. The richness here is in the historical detail which in the acknowledgements Kok attributes to manuscripts belonging to Dunbar himself. The value is limited, however, in two ways. There are vague folkloric references, a style of mythology which Kok avoids altogether in 1966. She also avoids in her later study the "is said to yield" method of analysis which here limits the veracity of what is, in her particular case, considerable practical experience.

Duncan, Ursula K. (1961). "A Visit to the Shetland Islands. " *The Lichenologist*, Vol. 1, p. 267-268; (See below).

Duncan, Ursula K. (1963). "A list of Fair Isle Lichens." *The Lichenologist*, Vol. 2, p. 171-178. These two papers by one of the few female lichenologists of the period are notable because they verify the presence or lack of specific dye lichens often referred to by non-botanical writers. When textile writers make reference to specific lichen dyes associated with Shetland (Simmons 1985) or Fair Isle (Rutt 1990) they generally do so without the benefit of lichenological experience. None of the three lichens described in Simmons 1985 as "traditional Shetland colours" can be verified by a reading of Duncan's 1961 list of Shetland species. Furthermore, Rutt's *Ochrolechia tartarea* is not to be found in Fair Isle, according to Duncan's 1963 paper. She comments that: "Fair Isle has a poor lichen flora owing to the acid nature of sandstone." Duncan's observations include a species of *Ochrolechia* that Grierson 1986 and Dallan 1997 claim to be inferior for dyeing, namely, *O. parella*. In 1992 Fair Isle historian and

musician Ann Sinclair told me that in her opinion, lichen dyeing was not nearly as common on the Shetland Islands as "some would have it". My own observations confirm that opinion; and they also verify Duncan's list of species except for a conspicuous abundance of *Ramalina siliquosa* at Sandness which Duncan apparently missed.

Edelstein, Sidney M. & Hector C. Borghetty. (1969). *The Plictho of Gioanventura Rosetti*: [See Rosetti, 1548].

Gerber, Fred and Willi Gerber. (1969). "Dyeing with lichens: they yield choice colors." *Handweaver and Craftsman*, Vol. 20 (2), Spring, p. 13ff. Fred Gerber was a textile iconoclast whose instincts about historical and modern dyeing and his encyclopedic grasp of the subject were a valuable resource under-valued in his own time. This incomparable expertise was lost as Gerber was unable to find a publisher for his last book before he died. No other lichen dye article from this period, published in Britain or the United States, offers more information on how to actually use umbilicate lichens. (For Canada, see Aiken 1970). A remarkable nine inch specimen of *Umbilicaria* shown here is the first photograph published in a North American craft magazine that identifies an indigenous AM dye lichen. The Gerbers use the former Latin name of 'Gyrophora' ; but although they misspell the species name, their photograph of Gyrophora 'dillenti' identifies *Umbilicaria mammulata*. Equally significant is the Gerbers' opinion that the "pound for pound" lichen to fibre ratio then in wide use is wasteful. [See Bliss 1981.] Moreover, these authors recognize the value of other contributions. "No amount of appreciation," they write, "will express adequately our appreciation to Eileen Bolton whose book...opened the door for us...into this fascinating source of dye materials." It was a special pleasure to present Fred Gerber with the 1991 edition of Eileen Bolton's book when I visited him in November 1993. [See also Gerber and Gerber 1973, Gerber and Liles 1987.]

Grant, Isabel Frances. (1961). *Highland Folk Ways*. London: Routledge & Paul. Written by an economist (*The Economic History of Scotland*) who was a collector of highland artifacts, this book is actually a guide to the Kingussie Folk Museum collection founded by Grant. It also illustrates the 'misinformation trail' that plagues the subject of lichen dyes to which authorities of note, like Grant, contribute. Her comment that "the easiest dye of all is crotal"

(p. 229) mirrors the Duchess of Sutherland's opinion expressed here in the identical words. (Ross 1896). More troublesome is Grant's misinterpretation of crotle as an AM dye. The Duchess interprets crotal as a BWM dye; but Grant does not re-investigate when she borrows her information. What is more disappointing is that Grant does not in any of her books even mention cudbear or the Gordon family.

Hofenk de Graaff, Judith H. (1969). "Natural Dyestuffs: Origin, Chemical Constitution, Identification." Paper presented to Plenary Meeting, International Council of Museums Committee for Conservation, September 15-19, Amsterdam. This much-quoted source, like Lunde 1976, conveys authority because of the museum context in which it is presented. The author uses what is described as 'cudbear' purchased from Dominion Herb Distributors (Montreal, Canada) for chromatographic studies that compare laboratory results with orcein and orcein extract. I object to the fact that these dye products are not identified in any way; not to lichen species, nor to the chemical constituents which are the subject of the paper (Solberg 1956). The author cites but misinterprets Kok whose opinion that orchil did not 'disappear' during the Middle Ages becomes in this text an ambiguous and contradictory reference.

Huntingdon, Eleanor. (December 16, 1961). "Glendyer." *Cape Breton Post*, Sydney, Nova Scotia. Feature article (illustrated), p. 12-13. This is a romanticized recounting of the story of Glendyer, a village in Inverness County, Cape Breton (Nova Scotia, Canada), and home of the 19th century Glendyer fulling mill. It is included in this thesis as the basis of my interpretation of the 'fakelore' of dyeing that survives in modern accounts (Mackley 1967) which are cited by scholars (Carlson 1997) and Gaelic textile specialists (MacLeod 1994). Reports of crotle dyeing at the mill circa 1850 are contained in the article: "Industries and pioneer wives," writes Huntingdon, "concocted their own dyes from roots, barks and lichens." A mid-1800 handbill from Glendyer Mill (Beaton Institute Archives, University College of Cape Breton, Sydney) makes no mention of dyeing in the advertisement of their wares. But information accompanying the handbill [anonymous; typed] gives the following version of the story: "In 1849 Donald MacLean MacDonald founded the first mill on he site. Shortly after he established the Dyeing Mill the area became known as 'The Dyer's Glen'." According to Cape Breton historian Jim St. Clair there was apparently so little money in the textile operation that MacDonald converted

the building to a sawmill. The article is important as an example of the extent to which the impression of a tradition lingers long after the fact. According to my research there is still no direct evidence that 'dyeing' was done at Glendyer, proving the 'Scottish' paradigm prevails.

Jenkins, John Geraint. (1969). *The Welsh Woollen Industry*. Cardiff: National Museum of Wales & Welsh Folk Museum, 1969. Had Jenkins used Bolton he might have brought to this description of lichen dyes the authority associated with his name in folklore studies. As it is we have a cryptic puzzle; a "pale green" from "rock moss" (p. 26) and a recipe for "tan" from "tree lichen" (*Ibid.*) which add nothing of value to this museum-published study of 18th and 19th century domestic woollen production in Wales. One clue to the veracity of the dye recipes in this book is the magenta from dandelion (p. 24; see Fraser 1983, Grierson 1986) which serves as a red flag of warning to experienced practitioners. This book is an example of the trivialization that characterizes lichen dyes and dyeing (see Grant 1961).

Kok, Annette. (1966). "A Short History of the Orchil Dyes." *The Lichenologist*, Vol. 3 (2), p. 248-272. [See also Dunbar 1962]. Other than *Lichens for Vegetable Dyeing*, no contribution has had a greater impact on the subject than this important study. Kok was a volunteer researcher at the British Museum (Natural History) where her access to libraries within the museum system and the assistance of Peter James enabled her to bring together a wealth of information on what was in 1966 an understudied subject. There has been little change, and Kok's intelligent analysis of historical documentation provided one model for a new study (Perkins 1986) and demonstrated to me the need for a comprehensive bibliography. Kok's experience as a dye practitioner enabled her to bring to this paper a depth of detail unmatched until Perkins' 1986 economic study. It is to Kok that other scholars turn; archaeologists, lichenologists, historians and textile aficionados cite Kok with the assurance that her opinion is definitive, her research solid. It is Kok who suggests that lichen dyes did not 'die out' after the fall of Rome, a claim reinforced by evidence of the medieval Norwegian trade in korkje. Among those who built upon this research is Walton Rogers who accepted Kok's challenge to test for the presence of lichen pigments in actual samples of cloth. Kok's insistence that original research would advance the subject by constructing a new analysis built on the incorporation of historical documentation was exemplified by her bibliography, one that

includes definitive sources such as Lindsay, Llano, Stenhouse, and Woodward. The problems here are semiotic: had Kok gone one step further and defined orchil by applying this name only to dyes based on *Roccella*; or defined non-*Roccella* AM dyes as 'orchil-type'; or attempted to interpret two of the three cudbear ingredients listed in the Gordon's patent application as what they apparently are, 'false starts' aimed at offsetting the competition (see Gordon 1786), there would be no erroneous references to *Cladonia pyxidata* as a source of purple dye, or to all AM dyes as 'orchil'. Nor would I have taken this direction in my life. The legacy of this study remains unsurpassed, its lasting value of such significance that the revision of textile historiography will recognize Kok 1966 as a benchmark.

Lønning, Sunniva. (1967). *Arbeidsmåtar og Oppskrifter for Plantefarging. (Methods and Recipes for Vegetable Dyeing)*. Oslo: Skrivestua. A later edition by Husfliden, Oslo, is dated 1970. Rarely seen and yet included in many textile references is this Norwegian manual that contains a number of references to lichen dyes such as 'granlav' (*Ochrolechia tartarea*) and 'steinlav' (*Parmelia saxatilis*). The publishing history of this small book is so convoluted, compared with the simple text (rather like Davidson 1950) that one wonders if those who include it in their bibliographies have actually read it? Another apt comparison in style and format is to Thurstan 1930. Lønning is not a comprehensive manual but a modest attempt to record process; it falls short of methodology as do other books of this period. Is such a book what Stronach planned? (Stronach 1940)

Mackley, Florence. (1967). *Handweaving in Cape Breton*. Sydney, NS: Privately printed. Acknowledged in Burnham and Burnham 1972 as having kept the Cape Breton weaving tradition alive, Florence Mackley's substantial collection of 19th century textiles and related equipment was housed in a rural museum where the collection was available not only to visiting scholars, but also to the public. This book is an attempt to provide a context for the collection. Mackley mentions lichens only in passing: "The pioneer women collected roots, barks and lichens from the woods and used them for their dyeing." (p. 50; compare Huntingdon 1961). During a 1970s interview with Mackley she communicated her awareness of lichens as a traditional Cape Breton dyestuff, and was as unequivocal on this point as is MacLeod today (MacLeod 1994). But there appears to be little archival documentation of that tradition; nor

is there anything else provided here (see Collister 1944).

Robinson, Stuart. (1969). *A History of Dyed Textiles*. Cambridge, MA: M.I.T Press. This comprehensive text contains references to lichen dyes whose value is limited due to misspelling of 'Rocella' (see Taylor 1986, Walton 1989) and a lack of footnotes. One example is Robinson's statement that lichens were among dyestuffs imported from India (p. 29), but he provides no species name nor a citation. (See Seshadri, below). Among the more suspect of the author's claims is that "The early settlers in America found the Indians there using the slimy green algae from stagnant pools to give a green stain, the lichens scratched off stones for yellow." (p. 32). The prestige of this publisher presumes a degree of accuracy which is conspicuously missing in this case. A reference to Annette Kok as an instructor of dyeing at Dartington Hall (p. 109) remains a useful detail of more value than the unfortunate legacy of 'Rocella'.

Schetky, EthelJane McD. (1964). *Dye Plants and Dyeing - A Handbook*. Special printing of Brooklyn Botanic Gardens *Plants & Gardens* Vol. 20 (3). The BBG series of dye handbooks published over a period of twenty-five years represents the paradox of craft textile literature [see also Weigle 1973; Buchanan 1990]. Although popular with hobby dyers, uneven editing and an inconsistent editorial philosophy have seriously limited the value of these compendiums to textile scholarship. Lichens dyes are only briefly included in the 1964 edition. Among these mentions is one that represents the first North American reference to korkje, by that name; and the dye is correctly linked to *Ochrolechia tartarea* (p. 68). Shand gives correct Latin names (p. 65) for Hebridean lichen dyes but the value of Tye's British Columbia *Letharia vulpina* (correctly named on p. 73) is diminished when Johnson's reference (on p. 74) includes the same lichen but by an older synonym, *Evernia vulpina*. Outstanding in the 1964 edition is Sidney Edelstein's "Historic works on dyeing" which draws attention to classic references such as the Plictho. Given his expertise, this item should not have been restricted to a mere two pages to save space, an overriding concern of the BBG publication board. Also of value is Yashiroda's opinion on the extent of natural dye use by the Ainu circa 1960 (p. 39), a case where cultural perception of dye-making is not matched by reality. But the same author's claim that it is difficult to find a cultivated specimen of *Polygonum tinctorium*, would be open to challenge today. Here, again, a firm editorial hand would have been of benefit. Beyond the subject of

lichen dyes but relevant to issues of ethnicity is Emmart's "Notes on Aztec dye plants" where the author subverts an editorial policy that prohibits notes. Emmart serves as a fine example of how scholars can reach a wider audience without sacrificing quality. This first dye book in the BBG series set a standard which has not since been surpassed, although the second one (Weigle 1973) offers choice items in regard to lichen dyes (see Gerber & Gerber 1973).

Seshadri, T.R. (1966). "Colouring Matters From Lichens". *Journal of the University of Bombay*, Vol. 34, p. 1-17. The value here is compromised by an atypical journal style, one without notes or a bibliography. Seshadri includes the chemistry of orcein and litmus and their biochemical structure; the molecular difference between orcein (which the author does not distinguished from orchil) and litmus; and a chemical analysis of specific lichen acids and anthraquinones. A chart of a dozen AM and BWM dye species includes no references whatsoever as to which species are *specific* to India. Moreover, *Roccella* spp., the classic orchil lichens which are found also in India, are missing from the chart altogether. If Professor Seshadri had linked the chemical discussion to specific dye lichens in the chart, this article would have value today as one of few sources of information on dye lichens in India. This is particularly regrettable as Robinson 1969 includes a vague reference to lichens "imported from India", one that is unsupported by notes. Seshadri's article sheds no light on when such a trade might have occurred. A comparison to Lal & Upreti 1995 shows the extent to which ethnological interpretation has superseded articles like this onewhere historical data from Europe is rewritten without regard to an ethnic, cultural, gender or geographical context.

Whipple Pope, Florence. (1964). *Processes in Dyeing with Vegetable Dyes and by Other Means*. Second edition. North Bennet Street Industrial School, Boston, Massachusetts. Robertson 1973 lists a 1960 edition which I have not seen. What is notable in this slim volume of dye recipes are the grammatical and typographical errors, and there are many. *Roccella* becomes "roccela" and *archil* a "violet red plant of the Canaries" (meaning a plant that is, itself, violet in colour?) in the lichen dye section (p. 14) of this uneven book that is cited, notwithstanding, by dozens of American sources including Kierstead. That Barber relies on Kierstead as a dye reference signifies the scope of the problem of lightweight material such as this.

1970 -1979

Adrosko, Rita. (1971). *Natural Dyes and Home Dyeing: A Practical Guide with over 150 Recipes*. New York: Dover Publications, Inc. Few dye manuals are more highly-regarded than this American classic with the confusing publication history. [See Furry & Viemont 1935]. *Natural Dyes and Home Dyeing* includes a revision of Furry & Viemont; but Adrosko's original research is contained in Part 1, which traces the history of natural dyestuffs in North America; her work is also evident in a two-part bibliography which is of considerable value to historians. A General Bibliography (p. 110-112) contains more than 90 sources drawn from many disciplines, sources as eclectic as Kalm's *Travels in North America* (circa 1750), and Pomet's *Histoire générale des drogues* (1694). Fluent in French, Adrosko's scholarship is evidenced by the fact that she had direct access to every item included in her exhaustive three-part bibliography. This is likely why her succinct treatment of orchil and cudbear is brief but accurate. Appendixes include an exhaustive list of common names and chemical descriptions of dye assists and mordants used in older books; and excerpts from several early 19th century manuals, including Cooper 1815 and Moroney 1833. Furthermore, Adrosko's treatment of orchil and cudbear is entirely accurate, and sufficiently referenced to lead the reader to more comprehensive sources such as Kok. To call this book a reprint of Furry & Viemont - which it is not - is to devalue Adrosko's expertise as a textile bibliophile and historian.

Aiken, Marie. (1970). "Lichens as a dye source." *Craftsman/L'Artisan*, 3 (3), Winter Issue, p. 16-18. [Paper presented at Word Crafts Council Conference, Dublin, Ireland, August 1970.] The contents of this article are as valid today as thirty years ago when Aiken presented her work in Dublin. Several years later, at the WCC conference in Toronto, Aiken gave a lichen dye seminar at which I was present. It is significant that a Canadian craft publication was prepared to publish a paper as esoteric as this one. It is also a persuasive argument in support of quality writing on craft and craft analysis. Taking her cue from Bolton 1960 and Kok 1966, a reference likely passed along to her by Brodo (below), Aiken includes Latin nomenclature. She describes chemical reagents to test for the presence of specific lichen acids and also correctly notes that *Roccella* purples "replaced murex", which represents a minor misinterpretation. The author is on firmer ground when she confronts the contradictions in old

recipes relative to the use of urine (see Grierson 1986). But in this otherwise outstanding contribution, Aiken provides no bibliography as a means to acknowledge Bolton or Kok (she borrows extensively from both), although she does make mention of Mason Hale, and acknowledge the assistance of Irwin M. Brodo.

Antúnez de Mayolo, Kay. (1976). *Peruvian Natural Dyes & Colouring Sources*. Thesis: California Polytechnic, San Luis Obispo. [See also Antúnez de Mayolo 1989]. The author notes that it is difficult "to locate a craftsman with significant knowledge of the plants that were used as dyes," a trend due to what is identified as a loss of cultural recognition of the value of natural dyes. Using as an impetus work done by Francisca Mayer and UK dyer Barbara Mullins in the region in 1970 and 1973, Antúnez de Mayolo's goal is to reclaim this narrative. What is unclear from the outset, however, is whether or not the author's dye experiments involved the five lichen dyes she includes (p. 18-20). Rather than provide evidence she made these dyes, the author cites Mayer as the source of her information, accordingly: "An infusion of the thallus (of *Teloschistes flavicans*, p. 18) produces an orange-yellow dye." A more useful economic reference is a lichen dye "commonly sold in markets," one derived from *Thamnolia vermicularis*. Here the dye colour, a yellow, is entirely consistent with Chambers who uses the same lichen in the Canadian arctic (see Buchanan 1990). Elsewhere Antúnez de Mayolo contributes significantly to the 'misinformation trail,' a phenomenon that plagues the historiography of lichen dyes. Her exact words, quoted from page 21, indicate that *Usnea barbata* was "once used by the native Peruvians to dye dark green to dark blue. (Lira 1940, 1945)." To revert to the "is said to yield" school of documentation compromises veracity. It would have been more useful to say if Mullins used this dye, and then cite those results. Did Mullins, as the author's mentor, use none of the Peruvian lichens herself? Was it impossible to find a practitioner who recognized lichens? More to the point, there are so few natural dyes that yield "dark blue" that to name such a colour from a lichen not known to produce that shade, is to invite suspicion. (Compare Bolton's 1960 description of her 'discovery' of blue from *Xanthoria parietina*.) The author's attention to voucher specimens (deposited at the Chicago Field Museum) and other minutiae of her project are consistent with normal academic procedures in regard to graduate degrees in biological sciences; yet three of the five lichens included as dyestuffs were "not collected", including the troublesome *U. barbata*.

Asahina, Yasuhiko and Shoji Shibata. (1971). *Chemistry of Lichen Substances*. Amsterdam: A. Asher & Co. Ltd. Reprint of the 1954 Tokyo edition. [See also Culberson 1969; Narui et al 1996]. This book appears at first glance to be more accessible to the dyer or student without a chemical background than is Culberson. Although the chapter on 'Classification of Lichen Substances' contains only two pages, and there is no table of contents, this brevity will be of benefit to readers who need only to know that depsides, depsidones and orcinol are aromatic compounds. Also useful is the one page description of chemical substances (p. 7) which describes the so-called 'thalline reactions' and lists reagents used by most dyers, although there is no warning associated with the mention of paraphenylenediamine [see Hale 1979 & Hale and Cole 1988]. The value to the lay reader ends here. For while the front matter may be straight forward, the remainder of the text is not divided, as is Culberson, according to genera and species. Culberson's succinct alphabetical arrangement of genera and species is ultimately of greater use.

Bearfoot, Will. (1975). *Mother Nature's Dyes and Fibers*. Willits, CA: Oliver Press. Only one lichen dye is included in this book, 'wolf moss' which is also identified by the correct but older name, *Evernia vulpina*. I have included this widely-available book for three reasons: as a comparison to Brough 1988 and Mason 1904 as a model of continuity; and as an example of the on-going discrepancy in regard to traditional ecological knowledge as to when lichens are best harvested. The claim here is that pigments are more concentrated in August, when lichens "will yield a stronger colour". (See Casselman 1978, Grierson 1986).

Bremnes, Gunn. (1979). "Om fargebruk i 'Døve-teppet'. " (On the use of dyes in the 'Døve coverlet'.) *Utgitt av Vestfold Historielag, Vestfoldminne*, p. 30-34. [Unpublished English translation by Kay Larson 1996]. As is the case with Lunde 1976 this article describes korkje as a dye that "fades very quickly." Nonetheless, it has influenced scholars in other disciplines who cite Bremnes and Lunde as definitive opinions on the subject. The fact that few have access to an English translation suggests that assumptions and suppositions are the basis of some of those flawed interpretations. For example, Bremnes devotes more space to BWM lichen dyes such as stenlav, than she does to korkje. More remarkable still is that this article contains neither a korkje 'recipe' nor even a description of the AM dye process. With only five

footnotes and no bibliography it is virtually impossible to regard this article as an authoritative view of korkje, but it is useful in regard to BWM lichen dyes where Bremnes' experiments show a lack of fading. Her example of this phenomenon is "the yellow dye" from "the Icelandic lichen" which I interpret as *Cetraria islandica*. [See also Lunde 1976, and Casselman 1999].

Brunello, Franco. (1973). *The Art of Dyeing in the History of Mankind*. First English edition. Cleveland, Oh: The Phoenix Dye Works. This is Bernard Hickey's English translation of the 1968 original (*L'arte della tintura nella storia dell'umanita*; Vicenza: Neri Pozza, 1968). This exhaustive study is popular for several reasons: it is the only comprehensive historiography of dyeing; it is authoritative; and by no means least in importance, this book was available free of charge from Phoenix. The strength of Brunello's research lies in his penchant for the subtle nuances of dye history. A case in point is the nagging question as to whether *The Plictho* was published in 1540, or 1548? Brunello is of the opinion that the "8" wore away; *Plictho* editors Edelstein and Borghetty agree. And therein lies the strength of this voluminous study. Brunello flourishes linguistic skills which provide access to ancient papyri and medieval dye manuscripts. His interpretation is astute, amusing and prescient. The value of this book to lichen dyeing is Brunello's one hundred references to AM and BWM lichen dyes such as crotal, cudbear, orchil, lacmus and orseille - *if* you can find them. Is it the quality of the translation or a lack of editing that is responsible for errors in all of the Indexes and Appendices? Nor is it possible to tell which of the many sources he names that Brunello actually used; one example is his assumption in regard to aboriginal lichen dyes in North America which due to bibliographic inaccuracies, cannot be traced (see Robinson 1969). But Brunello's grasp of the extent of the post-medieval lichen dye trade, and the role of lichen pigments in Industrial Europe, is fairly firm. What Brunello has left us is a mixed legacy: while we value the significant medieval information provided within the author's grasp of Italian history, he is also responsible for contributing to the 'misinformation trail' that leads many down the wrong road. Brunello insists that orchil 'died out' after the fall of Rome. It must be stated here that Kok's evidence to the contrary was available; moreover, Kok 1966 is included in his bibliography. This is why I take issue with Brunello as a definitive source. This book contains remarkable breadth but it requires carefully scrutiny. A case in point is Brunello's notion of two kinds of ancient orchil, one "wild", and the other, "possibly cultivated" (p. 99). What does he mean? The author is at

his best when he delves into the more colourful aspect of dye historiography. His description of Bancroft's shady career (p. 266); the gruesome details of blood and the stench of medieval dye works (p. 165); and his sleuthing in regard to historic works such as the Plictho (p. 183-185) are entertaining and informative. And until we have a more cogent history of dyeing, Brunello is all that we have.

Burnham, Harold B. & Dorothy K. Burnham. (1972). *Keep Me Warm One Night: Early Handweaving in Eastern Canada*. Toronto: University of Toronto Press. Although it contains but three brief reference to lichen dyes, this classic textile study is included here for the simple reason that the reference to *Umbilicaria*, on page 22, represents a great leap of faith, one too rarely taken. The 'unknown' purple described by the Burnhams as 'possibly' derived from fermented lichens is not an AM dye according to my 1997 visual survey of the textile in question. But more important is the process by which means the Burnhams eliminated other purple dyes: rather than claim the dye in question was lichen-based, they phrased their opinion in just such a way as to engage the interest of another researcher. That they were not reluctant to show their indecision is commendable in a tome as highly-regarded, worldwide, as is this outstanding Canadian study. Other authors who cannot come to grips with making a decision about a dye - or even discuss possibilities (see my annotation of Barber 1999) - would be well advised to follow the lead of the Burnhams in this regard.

Casselman, Karen Leigh. (1978). "Winter dyeing with umbilicate lichens." *Shuttle, Spindle & Dyepot*, IX (2), Issue 34, p. 8 - 11. In this article I describe dye tests that indicate there is little difference in AM dyes made from winter harvested lichens, compared to those collected in the summer. This distinction is important because there is much information to the contrary (compare Bearfoot 1975). There are two obvious weaknesses in this, my first article on the subject of lichen dyeing: I advised an AM vat fermentation period of only 4-6 weeks; and I suggested the use of mordants to improve fastness. I accept responsibility for these problems in methodology. Since that time I have discovered longer fermentation improves fastness (Casselman 1986-2000). But my early recommendations often were revised or otherwise altered. For example, McGuffin et al 1986 cite my work but they adopt a 2-3 week fermentation period for AM dyes, thereby halving the inadequate time I suggested.

Casselmann, Karen Leigh. (1979). "The primeval dyepot." *Harrowsmith Magazine*, IV (1), August, p. 67-69. [See Aiken 1970]. This first article I wrote for a Canadian magazine provided an opportunity to acknowledge Canadian dyer Marie Aiken, then of Gravenhurst, Ontario. This article also features first-hand accounts of the fade resistance of my students' lichen dyes when compared with imported products such as logwood.

Chiasson, Father Anselme. (1972). *History and Acadian Traditions of Chéticamp*. Translated from the 3rd. Acadian edition by Jean Doris LeBlanc (Moncton: Éditions des Aboiteaux). St. John's, Nfld: Breakwater Books, 1986. [See also Chiasson & Deveau 1985]. Well-known as the motivational force behind La Société Historique Acadienne, in this book Father Chiasson describes the everyday lives of the people of Cheticamp, a coastal village in Cape Breton whose Acadian population enjoys a lifestyle that in many respects remained little-changed during the 1950s and 1960s. Chiasson claims, for example, that "each family cultivated tobacco for its own use", and that the women made a "beautiful yellow dye" from "the moss of the wild cherry tree" (p. 46). This reference is included because of the paucity of Acadian references (see Earle 1898, Labelle 1995); and to establish that 'moss' as a common name for lichens has persisted in cross-cultural applications (i.e. see Isham 1743, Edge 1915).

Culberson, Chicita F. & William Louis Culberson & Anita Johnson. (1977). *Second Supplement to "Chemical and Botanical Guide to Lichen Products"*. St. Louis, Mo: American Bryological and Lichenological Society, Inc. This updated and revised edition of Culberson 1969 is the one cited in lichenological papers because of specific technical advances made by this research team, but the changes it contains are not applicable to the lay reader. The earlier version, which is more widely available, is adequate for information on dye acids.

Duncan, Molly. (1972). "Lichens in Alaska." *The Australian Hand Weaver & Spinner*, XXIV (1), August, p. 20-24. In this article Duncan writes with a surer hand than is evidenced in her 1973 book. The author gives Latin names for over twenty dye species; she includes an accurate description of the chemical process involved in making AM and BWM dyes; and in her text cites sources such as Hale as a means to correct identification of species. Duncan writes of Bolton's 1960 *Lichens for Vegetable Dyeing* that it is "a small booklet now out of print" which

she nonetheless acknowledges as a "great help" (see Gerber & Gerber 1969). It is unfortunate that Duncan's book (below) does not measure up to this article.

Duncan, Molly. (1973). *Spin Your Own Wool and Dye It and Weave It*. Revised and enlarged edition. Wellington, NZ: A.H. & A.W. Reed. If the lichen information in this book which enjoyed two editions and additional printings between 1986 and 1973 was as reliable as Duncan's 1972 article, dyers in Australia and New Zealand might not have been the target of the 'anti-dye' lobby. It is in this book that Duncan recommends a 2:1 lichen to fibre ratio as her measure for both AM and BWM dyes, which gave ample ammunition to those who censured dyers (Filson & Rogers 1979). That Duncan's recipes (actually, a vague set of directions) added fuel to the heated debate that ensued is unfortunate; but craft writers must accept responsibility for legacy of their work. (See Bliss 1981) It is not surprising that Reed, who published a lichen text the previous year (Martin & Child 1972), did not subject this manuscript to further scrutiny; it underscores what I see as the marginalization of dyeing.

Farrar, W.V. (1974). "Synthetic dyes before 1860." *Endeavour*, Vol. 33 (September 1974), p. 149-155. This article is included as a rare example of the argument advanced by some chemists that AM lichen dyes are, in fact, *synthetic*. Farrar claims that orchil is a synthetic dyestuff according to his definition of the term as a substance *which does not occur in nature*, one which is deliberately made by a chemical reaction. This radical opinion is little-noted by dye writers who consider AM dyes to be 'natural' products as are BWM dyes, but Farrar's work deserves further scrutiny in light of recent studies on fermentation (Kadolph 1999).

Fenton, Alexander. (1976). *Scottish Country Life*. Edinburgh: John Donald Publishers. Formerly at Scotland's the National Museum of Antiquities, Fenton is an authority on agriculture, archaeology, culture and history. In this book "roots, herbs and lichens" (p. 131) are marginalized as part of the domestic activity associated with seasonal work at the shieling.

Fenton, Alexander. (1978). *The Northern Isles: Orkney and Shetland*. Edinburgh: John Donald Publishers Ltd. Lichen dyes are included here but they provide little information or value because the author uses vernacular names not associated with specific species. This

is an example: "A reddish purple-dye, corcolit (sic), was got from rock scurfs, *Lich. tartareus*, ground to a powder and soaked in urine for several days" (p. 459). Fenton continues with a description of forming "corcolit" into balls and then adds: "A yellowish brown was got from Old Man, *Lich. saxatilis*". (*Ibid.*). If Thurstan 1930 and Viner & Viner 1946 can include the Latin name of *Ochrolechia tartarea* for the first dye described, and *Parmelia saxatilis* for the second, then in my opinion we have this same expectation of a scholar. That historians pay close attention to the minutiae of their subject in every other way is the basis of my claim that lichen dyeing is marginalized, for otherwise authoritative sources use 'folklore' as a substitute for veracity. [Compare Grant 1961 and Hartley 1979]. But Fenton makes another claim that is valid when he denies that "Fair Isle had any special claim in respect of native dyes" (p. 459). I have verified this statement in a conversation with one of the island's cultural historians (pers. com., interview with Ann Sinclair, The Post Office, Fair Isle, August 1992).

Filson, Rex and Roderick Rogers. (1979). *Lichens of South Australia*. Adelaide, South Australia: D.J. Woolman. [See Martin & Child 1972]. The strength and determination of the anti-dye lobby in Britain (see Starkey 1977) and Australia was early in my career, a contentious warning. Two decades later I see this situation differently. It is my hypothesis that popular dye manuals such as Duncan 1973 and Van Stralen 1993 are responsible for a legacy as questionable as Lunde's, albeit one of ethics. When authors generate an excitement about making dyes they must use language that conveys restraint and state clearly that over-harvesting is unacceptable. What Filson and Rogers did was respond to this frenzy as concerned scientists: "The use of lichens in dyeing," they write, "must be discouraged [as] already scenic areas in Australia are being denuded of their lichen flora by... home dyeing enthusiasts." ("Code for Collectors", n/p.) I also responded to Filson and Rogers' warning in a personal way by developing 'salvage botany' as a strategy (Casselman 1993a, 1996c, 2000d) that is now in use in Australia (pers. com. I. Flint, Mount Pleasant, 1998-99).

Forrester, Stanley D. (1975). "The fast and the fugitive: lightfastness testing of dyed textiles up to the 1890s." *Journal of the Society of Dyers and Colourists*. Vol. 91, July 1975, p. 217-223. This comprehensive article with almost sixty end notes provides an historical context for lightfastness based on the work of the famous French and English dyers. Forrester contrasts

Bancroft's and Chevreul's opinion on the fugacity of lichen dyes - a controversial topic even today - in such a way as to draw the reader into the intricacies of the debate. That the issue is complex is illustrated here when Forrester cites Bancroft's claim that orchil "ought never to be used" (p. 220). Yet I cannot in my own reading of Bancroft 1813 verify this statement. On balance, Forrester cites Hummel's interpretation of orchil experiments which were "found not to fade during the space of two years if exposed to light in a vacuum." (See Gardner 1896).

Geijer, Agnes. (1979). *A History of Textile Art*. London: Pasold Research Fund in association with Sotheby Parke Bernet. An example of Lunde's legacy is the manner in which a number of sources applied her unfavourable opinion of korkje to all AM dyes, including orchil. Geijer writes that orchil is derived from "a species of the 'Rocella' family", and that it gives "a short-lived blue-red colour which...changes to an unpleasant shade of mauve and bluish pink" (p. 208; compare Gardner 1896). Is it possible that Geijer, a textile curator, has mistaken faded orchil with faded *logwood*? One curator of textiles has drawn to my attention to Norwegian textiles where logwood purples have faded to an unpleasant 'dirty mauve'. (pers. com. L. Gilbertson, Vesterheim Norwegian-American Museum, Decorah, Iowa, 1995-1996.) This dirty colour is evidence that the dye in question is logwood, for when AM dyes fade they revert to an a 'pretty' pastel pink. Geijer's book is also troublesome for the unpleasant manner in which she describes recipes in the *Papyrus Holmiensis* as "bear(ing) witness to technical ignorance" (p. 209; for evidence to the contrary, see Sandberg 1997). For a book of uneven quality to carry the imprimatur of a prestigious textile research centre is discussed in my annotation of Robinson 1969, whose misspelling of *Rocella* is possibly derived from that very source.

Gerber, Fred & Willi. (1973). "Dye Plants of the Deep South." In: P. Weigle, ed., *Natural Plant Dyeing*, Brooklyn Botanic Gardens, p. 17-18. Although there are two other lichen dye articles in Weigle 1973, the Gerber contribution deserves special mention because it is possibly the only reference before my current work to the little-known North American lichen *Lasallia pensylvanica*. Not only is it correctly spelled, the Gerbers also use a cold overnight dye process that is also little-known, one that was the source for my own investigation (Casselman 1993a). Their success with species of *Cladonia* is also noteworthy. The Gerber and Hewitt 1973 are the value in Weigle 1973.

Gerber, Fred. (1977). *Indigo and the Antiquity of Dyeing*. Osmond Beach, FL: Privately printed. Gerber's insightful text, comprehensive index, and extensive bibliography in which he includes Bolton and Hale, testify to the author's shift away from 'recreational craft' to anthropology, history and socioeconomics. His passionately-held opinions, however, are delivered in such a way as to occasionally weaken rather than strengthen his arguments. For example Gerber is the first craft writer to *hint* that murex was "colour-enhanced" (p. 46) by orchil, dyes which he describes as "more brilliant" than murex but also, in his opinion, more "fugitive" (see Rawson et al 1901). This contradictory statement is subsequently explained in Liles & Gerber 1987 where the fugacity of murex is acknowledged. Gerber provokes the reader as few other writers do, and in a way that forces one to be a more critical reader.

Grae, Ida. (1974). *Nature's Colors: Dyes From Plants*. New York: MacMillan, 1974. Buried within this deservedly popular book is a wealth of information obscured due to the inability to organize the material in a cogent manner. The chapter on lichens is weakened substantially by the use of not one, but two common names for every lichen included. For example, "brown rock lichen" is also "oyster lichen" (p. 78), a description that has little meaning in regard to the actual genus, *Umbilicaria*. The methodology for AM and BWM is there, amid the clutter; but inappropriate ratios (e.g. "lichens, broken up, about ¼ cup" and "½ cup ammonia" in "2 cups of water" (p. 79) do not translate to a useful formula. What is remarkable in this book is the essence of the soul of the writer; Ida Grae is intelligent, thoughtful, passionate. A rigorous copy-editor could have done justice to a text that meanders from visionary to mundane.

Green, Judy. (1975). *Natural Dyes from Northwest Plants*. McMinnville, OR: Robin & Russ Handweavers. Written at the same time as Ida Grae's work, this modest book with only two pages of lichen dye recipes is far more succinct and more useful. Green has a firm grasp of the AM and BWM methods which she conveys to the reader, very briefly but accurately. One wonders, however, how and why this book occurs as one among the mere handful of dye manuals in the bibliography of a book on arctic lichen and plants dyes? (McGrath 1977).

Hale, Mason E. Jr. (1979). *How to Know the Lichens*. Second Edition. Dubuque, IA: Wm. C. Brown, 1979. Before Hale, dyers who needed help identifying lichens had two choices: a

1930s USA text book with a dozen photographs, or an earlier one, written in Britain, illustrated with line drawings and inadequate photographs [see Smith 1921]. The 1969 edition of this book with its distinctive black and yellow covers introduced dyes to lichen identification from a North American perspective. An expanded text, nomenclatural changes, and orange and white covers identify the 1979 edition of this classic study by an esteemed scientist who was reputed by the director at the Humboldt Institute, Steuben, Maine, to have run thin layer chromatography tests in their kitchen range. Included here are photographs of many popular dye species which in spite of a lack of colour are perfectly adequate as a means to identify the most common species. There is substantial evidence in Bolton 1960 to show that Hale was ahead of his time with his concept of lichen dyeing as a subject worthy of pursuit. Moreover, as did Laundon, James and Richardson, Hale actively engaged in a discourse with interdisciplinary scholars (Perkins 1986) and independent researchers such as Bolton. In 1990 Hale issued an open-ended invitation to use his Smithsonian office where a set of lichen dyed samples was displayed. Were these Eileen Bolton's samples, or his own? The answer remains unknown; but it was a rare opportunity for me to ponder the links between Hale and Bolton, and Bolton and myself, and take pleasure in the completion of the circle. In regard to legacy, Hale's apparent disregard for the carcinogenic potential of paraphenylenediamine (the lichen reagent described in this and other field guides as "P") is much more clearly annunciated in Hale & Cole 1988 than it was here, a decade earlier. As noted in my essay (p. 9), errors in authoritative sources tend to have a much higher profile in that regard.

Hartley, Dorothy. (1979). *Lost Country Life*. New York: Pantheon. [See. Hartley and Elliot 1926-1931; and Hartley 1939]. Hartley's career as social historian is remarkable for its duration. This nostalgic validation of rural life has charm, as does all of Hartley's work. But the lack of a bibliography prevents the critical reader from tracing a vernacular name for BWM dyes I have seen nowhere else. Hartley's 'rachan' described on page 140 as "...the grey lichen that gives Harris tweeds their distinctive odour" does not occur among the plethora of names in MacLagan 1896, for example, or Bolton 1960. We must therefore presume that Hartley refers here to crottle. Why not use the more common name? There is also a possibility that her reference here is not to crottle at all, but to another BWM lichen, *Lobaria pulmonaria*, one that was known in certain districts of Britain as "rags". (Compare Grant 1961).

Hewitt, Miriam B. (1973). "A substitute for a traditional dyestuff." In: P. Weigle, ed., *Natural Plant Dyeing - A Handbook*. Special printing of Brooklyn Botanic Gardens *Plants & Gardens* Vol. 29. This article and Yacopino 1973 are the most outstanding portion of the second BBG dye book (see Schetky 1964). Hewitt's description of *Umbilicaria pustulata* as a substitute for *Ochrolechia tartarea* in Scottish cudbear is correct (p. 37) Furthermore, Hewitt actually prepared and experimented with a North American version of cudbear which she calls 'orchil,' as did I, myself, during the 1970s (Casselman 1980). Hewitt combines her AM dye with cochineal, madder and logwood to replicate historical dye combinations. I agree completely with Hewitt that orchil-type dyes "do not seem to lose their initial colour under normal fading conditions" (p. 37). The view that *Umbilicaria mammulata* "is less potent" than other umbilicate species does not support my own findings but Hewitt's empirical knowledge in this regard confirms reports of the geographical variability of substance concentration.

Hæg, Ove Arbo. (1976). *Planter og Tradisjon: Floraen i levende tale og tradisjon (Plants and Tradition: Norse flora 1925-1973 in The Oral Tradition.)* Oslo: Universitetsforlaget. This book is based on archival documents, diaries and first-hand accounts. The lichen dye section (p. 142-161) includes numerous references to AM dyes such as korkje, and BWM dyes by several vernacular names. Particularly important are gender-specific references in this book, and reference to the physical risk of the lichen harvest as seasonal labour. The author includes reports of the dangers of the mountain and coastal harvest; and how the sale of korkje enabled a young woman to purchase her wedding dress. Other than ethnobotanical studies such as Turner et al 1990, few contemporary books use this documentary approach to the use of plants which provides a valuable human as well as a cultural and economic context.

Jensen, Nicolina. (1977). "Faroese Gold." *Færoe Isles Review*, Vol. 2 (1), p. 24-29. This article provides an excellent survey of domestic Faroese textile production with considerable space allotted to the history and development of native sheep. A brief account of the handcraft initiative of the Faroese Home Industries, founded in 1935, is useful as a comparison with the Highland and Scottish model of Ross 1896, and the Donegal Industrial Fund described by Hoad 1987. Unfortunately there is no indication in this article if it was Katrina Trøllanesi who dyed the samples on page 25 that include 'korki', 'steinamosi', and the much less well-known

'jardarsipan', a BWM dye made from *Peltigera canina*. one traceable in mid-eighteenth century Europe to Denmark (Wold & Nielsen 1984; see also Trøllanesi 1972, Bærentsen 1987.)

Kilbride, Thomas. (1979). "Weaving Traditions in the Scottish Highlands." *Weavers' Journal*, Issue No. 111, Autumn, p. 12-15. Kilbride admits that "Precise information about dyestuffs is hard to come by." In this article he notes "The Gaelic word for almost all lichen dyes is crotal, and "...the most common dye was *crotal dubh*", or *Parmelia omphalodes*." (p. 14). In a recent letter to me, however, Kilbride writes of "crottle" which he says is among the lichens that Lesley Kilbride still uses, including "cudbear and *Ramalina*." (pers. com., letter, January 14, 1999). The value of this article is the firsthand account of a lifestyle in crofting and weaving that in 1979 was fast disappearing. The value of the correspondence is in learning that such a lifestyle continues today. Of considerable importance in historiographical terms is the fact that Val KilBride (Thomas' father, whose name is spelled in this manner) was dye master at Ethel Mairet's Gospels Workshop. A picture of KilBride senior at the Gospels is shown on page 63 of Margot Coatts biography of Mairet, *A Weavers' Life* (Bath: Crafts Study Centre and British Crafts Council, 1983; see also Hill 1998).

Klemola, Marketta. (1978). *Kasvivärjäys. (Natural Dyes)*. Helsinki: Kustannusosakeyhtiö Tammi, 1978. [See Hellén 1918, Kontturi 1947]. Klemola appears to have used Hellén and Kontturi as a foundation to her lichen section (p. 23-24) to which she also added *Alectoria sarmentosa* and *Cladonia rangiferina*. There are no recipes as such, only brief "mentions" done in a style identical to that used by Kontturi.

Krochmal, Arnold & Connie Krochmal. (1974). *The Complete Illustrated Book of Dyes from Natural Sources*. Garden City, NY: Doubleday & Company. "The beautiful and sturdy Harris tweeds of Scotland," write the authors, "are to this day dyed with lichens...". So begins Chapter 6 (p. 36) of this book which has a questionable legacy in regard to the ethical use of lichens for dyeing, and the veracity of praxis. Recipes that specify "two gallons of lichens" and the routine use of mordants with BWM dyes that do not require them, make this a book of limited value. The senior author's has considerable academic credentials. These do not preclude a lack of depth on the subject of historical lichen dyes which are summed up by this quote:

"This mixture of lichens called cudbear originated in Scotland ... and was much liked in Europe. Available as a powder... it was exported to the United States but never sold well." (p. 39). Hills 1857 and Rambo Walker 1940 provide evidence to the contrary, as does Lesch 1970.

Lathrop-Smit, Hermine. (1978). *Natural Dyes*. James Lorimer & Company: Toronto. This book combines scholarship, such as references to Peter Kalm and Watson 1757, with the barest of recipes in a style reminiscent of Fraser 1983. There are useful warnings against over-harvesting lichens (p. 66) and conservative lichen to fibre ratios. But the only AM lichen the author includes is the problematic *Ochrolechia parella* (see Grierson 1986; Dallon 1997). That an Ontario author would mention this species instead of the ubiquitous umbilicates of northern Ontario strongly suggests a lack of empirical knowledge specific to AM and BWM lichen dyes.

Lesch, Alma. (1970). *Vegetable Dyeing: 150 Color Recipes for dyeing yarn and fabrics with natural materials*. New York: Watson-Guption. At the 1974 World Craft Council conference in Toronto, this book was a hotly-debated topic of conversation, although I do not recall the author delivering a program as did Marie Aiken. The controversy focused on (of all things) Glauber's salts; and while this has nothing to do with lichen dyes, the fact that Lesch chose to make a departure from accepted methodologies was a clue to the craft polemics which I identify in *The Gorsebrook Papers*. Lesch does not include a section on lichen dyes because she claims they are different from other 'vegetable' dyes; nor is that omission why her work is included here. What is significant is the author's opinion that cudbear is still commercially available in the USA in 1970. Given the few references we have to cudbear as a commercial product in modern America, and inaccuracies in regard to the interpretation of its historical availability, as indicated in my annotation of Krochmal and Krochmal, Lesch becomes a very useful and significant signpost of authenticity along the highway of misinformation to which she has not, like the Krochmals, contributed. [See also Hewitt 1973].

Lloyd, Joyce. (1971). *Dyes From Plants of Australia and New Zealand, A Practical Guide for Craftworkers*. Wellington: A.H. and A.W. Reed. A privately printed 1950 edition is described in the author's own words: "The present book [1971] is based on the above but is so changed and extended in text and illustrations as to be a new book." (p. 46). This claim

is puzzling as I saw in Rita Adrosko's library an earlier but undated imprint with a full colour lichen dye chart that is absent in the 1971 edition. What would have rescued Lloyd's book from mediocrity is attention to detail. Imagine an author who in a bibliography of less than ten items includes mention of the earlier edition(s) of her own book, as above, but *minus* any reference to publication dates. Notable in the 1971 edition of Lloyd is a conservative equal measure of lichen to fibre, a ratio that contrasts sharply with her compatriot, Molly Duncan. Lloyd also includes here brief but valid instructions to make AM and BWM dyes based on a dozen common species. Moreover, Lloyd is entirely correct when she states that one lichen, *Pseudocyphellaria coronata*, does in fact react to mordants. [See Gordon 1980].

Lunde, Dagmar. (1976). "Forsøk med korkje (Experiments with korkje)." In: Rød tråd: drakt og tekstil. (Red thread [yarn] in dress and textiles.) *Årbok 1972-75*. Kunstindustrimuseet i Oslo, p. 119-130. [Norwegian, with English abstract.] English translation (unpublished) by Reidun Almedal, Kristiansand, Norway (see also Almedal 1986). A full discussion of the methodological problems Lunde experienced in her korkje research is described in my research paper relevant to this article (see Casselman 1999). But it is important to recognize specific problems at the outset. At no point in this article is *Ochrolechia tartarea* named as the lichen from which korkje derives; moreover, Lunde makes it clear that she is uncertain as to whether or not she has used the 'right' lichen. This is of great significance because Lunde is quoted worldwide by scholars in many disciplines who cite it as a definitive source. Thus Lunde's failure with korkje is *by extension* applied non-critically to all northern European lichen dyes, regardless of dye type. How and why Lunde's flawed interpretation has been so eagerly accepted is in my opinion a simple case of availability. Scholars who require Norse textile references cite Lunde because the article is there, in a museum publication, accompanied by an abstract. Many have assessed the value based entirely on the English abstract. Cooksey 1997 describes Lunde as an article on the history of korkje, yet Almedal's translation indicates this description is inappropriate as there is no historical documentation in support of trade or praxis (Vågen & Engelskjøn, forthcoming). Few who have read Lunde recognize what is significant in her research. There is considerable historical value in Lunde's claim that in the 1970s it is impossible to find a korkje practitioner in Norway. This statement offers an important contrast in regard to culturally marginalized areas such as the Færoe Islands. (See Trøllanesi 1972).

MacKay, John Alexander. (1976). *Rural Crafts in Scotland*. London: Hale. [See Manners, below; Carter & Rae 1988; Yeadon 1990]. I have selected several of many examples to illustrate how lichen dyes survive today as cultural tourism. Issues of Eurocentricity and the authenticity of praxis are relevant when one dyer (the ubiquitous Marian Campbell of Plocrapool, who died January 11, 1996) is recognized as the epitome of the crottle dyer. The extent to which one woman can spin, dye and weave the yards of tweed required to supply the daily tour buses at her studio (Campbell described to me in 1985 more than 12 buses a day) raises questions. MacKay's telling of this narrative would lose nothing if it were to acknowledge the prodigious effort involved in domestic tweed production. On the contrary, such recognition would underscore the credibility of Campbell whose spinning, dyeing and weaving skills are worthy of comment as labour. But craft as 'work' is clearly not part of MacKay's cultural agenda, which is to popularize craft for the consumption of the dominant group. There is nothing shameful in the fact that Campbell's success made it impossible for her to continue to make crottle. That she could not keep up with the demand for her tweed identifies the value of ethnic textiles. As the pressure to maintain praxis increased, dyeing declined due to the time required to make the dyes. The expectation to perpetuate crottle dyeing past when it could be done likely came from observers who wanted to "see" it.

MacMillan, Bill. (1979). "Lichens." *Nature Canada*, October/December, p. 21-26. Few articles on lichens aimed at the general reader are as fact-filled as this one. The author provides a biological and ecological context for a variety of species accompanied by photographs of a clarity consistent with Sharnoff & Sharnoff 1997. A freelance writer and photographer and not a specialist as are Armstrong and Platt 1993, MacMillan's analysis of current dyeing practices relevant to Harris tweed are prefaced with the phrase, "In the past..." (p. 25). [See Manners, below]. He correctly links "crottle" to *Parmelia* spp., and red and purple dyes to *Ochrolechia*. MacMillan also chooses his words carefully when he states that "some lichen dyes are still used in the Outer Hebrides but they have mostly been replaced by modern dyes."

Manners, John E. (1978). *Crafts of the Highlands and Islands*. Newton Abbot: David & Charles. This book is especially interesting on two counts: it was published at approximately the same time and by the same publisher as Richardson's classic study, *The Vanishing Lichens*.

Here Marion Campbell of Plocrapool is again the typical tweed weaver. Beside her loom is a basket of lichen which Manners accepts at face value as verification of lichen dye-making. I do not fault Manners for including Campbell, for she is the quintessential Hebridean artisan in Richardson 1975 and countless other books. But in the latter case the caption that accompanies her photograph demonstrates if not a degree of scepticism on the part of the author (who spent considerable time with her), then at least the critical eye of the scientist. No such doubts contaminate the craft and popular literature of the period as evidenced by MacKay, Carter & Rae 1988, and a host of others. (See MacLean & Carroll 1985).

Martin, William B. & John Child. (1972). *Lichens of New Zealand*. Wellington, NZ: A.H. & A.W. Reed. A fascinating comparison in regard to the perception of lichen dye activity is offered by two teams of lichenologists; this pair in New Zealand, and their Australian counterparts, Filson and Rogers 1979. Martin and Child espouse an opinion of dyeing that is comparable to that of Irwin Brodo, Peter James, Jack Laundon, and David Richardson, all of whom have at various times assisted in the preparation of articles and books on the subject of dyeing. Whereas the aforementioned do not by their assistance necessarily subscribe to the view that dyeing is harmless, they have and continue to encourage research in that regard. Martin and Child go one step further, however; they include AM and BWM dye methods within the context of a lichenological text. The only other book to do this is Richardson 1975; in both cases, a moderate tone served as an example to dyers that they might expect and receive advice on identification if and when required.

McGrath, Judy Waldner. (1977). *Dyes From Lichens and Plants*. Toronto: Van Nostrand Reinhold Ltd. Three other Canadian dye books in this thesis were published between 1977 and 1980 (Sauvé 1977; Lathrop-Smit 1978; and Casselman 1980). The value in McGrath's treatment is high quality colour; a carefully-edited text, and comprehensive methods. That one of the first two modern Canadian dye books received this attention to detail identifies the level of interest in natural dyes at that time. McGrath was ahead of her time in her use of dye making as a means to explore ethnicity and race within an educational context, and her sensitivity in this regard is not in my opinion matched by Sauvé. (Goodwin 1980 used a similar approach in Britain.). McGrath is at her best when she describes how she came to Spence Bay; the

funding process that made her dye project possible; and the manner in which the Inuit women responded as dye makers to the aesthetic and economic aspects of new methodologies. The weaknesses here are in no way related to McGrath as a cultural facilitator or observer of Inuit lifestyle. They are obvious when McGrath leaves the Inuit cultural context and tackles British dye history. There is a tendency here to repeat unsubstantiated dye colours such as Mairet's 1916 'purple' from *Parmelia omphalodes* (p. 26). McGrath also sprinkles throughout references to Lindsay's without including him in her bibliography. More serious are sweeping generalizations such as the notion that lichens from rocks 'generally give the best colours' (p. 58). With no trees available in the arctic, this comment cannot reflect the author's experience; nor does she indicate if this was her experience elsewhere. McGrath claims that "most of the *Usnea* lichens have purple dye potential" (p. 121). This cannot be substantiated. But it is McGrath's use of industrial strength ammonia and the lack of any warning as to the potential danger of the product that has dated this book. (See Windt 1970 for POD fading that I suggest may be linked to commercial ammonia). McGrath's *métier* is her cultural sensitivity and the way in which she brings the textile work of Inuit women to an international audience without misappropriating their culture.

Merrill, Ruth Robertson & Barbara McCabe Haight. (1975). *Barbara 'N Me: On Lichening and Learning*. Olympia, WA: Sherwood Press, n/p. [Compare Samuel & Higgins 1973; Windt 1970] This manual is visually indistinguishable from Samuel & Higgins 1973, even to the covers and the spiral format; moreover, it originates in the same region of the United States, at the same time, and also employs the same 'adventuresome learning' language that characterises the 1970s model of natural dyeing. This derivative style and dated prose are the only flaws in a useful book. Once past jokes about the "old-fashioned potty" (in their view, the ideal dye pot), there is extraordinarily good advice although a lack of pagination is an obstacle. The authors qualify as conservationists with the advice that "dried lichen is an economical product. "Disregard the old rule of pound of plant per pound of wool," they suggest, for "...many need only a good handful." Although the ethical debate was perhaps not a topic with which the authors consciously wrestled, the non-wasteful methods set forth in this book recommend it as a useful and relevant guide. Merrill and Haight experimented with lichens of Washington state and southcentral British Columbia, including species such as *Alectoria*,

Evernia, Ochrolechia, Parmelia, Peltigera, Ramalina, Umbilicaria and *Usnea*. Of particular value as an identification aid is the inclusion of actual lichens (small pieces of thallus are attached to where the species so illustrated is described). This book is the prime example of lichen dyeing as 1970s cultural iconography, and it is eminently collectible. Among the pioneers I sought over the years were these two authors; but nowhere in my travels did I learn anything about either of them. If, for example, Haight did make the blue dye from *Xanthoria* without any prior knowledge of Bolton's work, which is apparently the case, then she deserves recognition for her perspicacity with one of the most challenging of lichen dye experiments.

Miranda, Catherine Bailey. (1973?). *Natural Dyeing Notes*. Preble, NY: privately-printed. Bailey, the compiler here, admits that The 7 Valley Weavers Guild found "the chief problem...to be the identification of the lichens" (p. 31). Notwithstanding, she pulls into this publication most of the few resources then available such as Aiken 1970. With fewer errors, Miranda and her guild might well have been proud of their efforts. But the typist made some glaring mistakes. The most conspicuous is the description of "excellent (lichen) pictures in the centrefold" which is here attributed not to Bolton or to Lloyd but to Violetta Thurstan. No edition of Thurstan that I have seen has such a centrefold, but Bolton 1960 and a pre-1971 edition of Lloyd certainly do. There is no date on this publication either; one deduces '1973' from clues in the bibliography.

Mitchell, Lillias. (1978). *Irish Spinning, Dyeing and Weaving: an anthology from original documents collected by Lillias Mitchell*. Dundalk: Dundalgan Press. It is not too great a claim to suggest Mitchell is among the few to acknowledge the pre-medieval murex industry in Ireland. Citing Henry's 1952 article, "A Wooden Hut in Inishkea North, Co. Mayo" (Journal of the Royal Society of Antiquarians of Ireland, Vol. 82), Mitchell wades into archaeology, linguistics and etymology without hesitation to present a fairly disjointed but spirited argument in support of Henry's interpretation of the "hut" in question, as a dye house. Her evidence is persuasive. That a doctoral thesis on this very subject is now underway (Emily Murray, Queen's University, Belfast: defense September 1999) suggests that Mitchell's autodidactic tendencies are, like Bolton's, responsible for triggering a wave of interest. But readers who seek more information than the disjointed bibliography provides, will be somewhat

frustrated in their attempt to locate her sources.

Mustard, Frances E. (1977). *Dyeing the Natural Way*. Mateson, IL: Greatlakes Living Press. A comparison of American publications with Canadian books of the period such as McGrath 1977 provides an underlying difference in philosophy. This book presents the subject as isolated from anything but the dyer's immediate need for creative stimulation. The "try it, it's fun" approach has as one limitation the presumption that no safety measures are required; here the author boasts that even when using indigo "I rarely even wear rubber gloves" (p. 1). The lichen section is an odd mix of accuracy and fiction, as illustrated by this bizarre explanation of lichen habitat: "The only places they can't survive is with man or under the constant spray of a waterfall." (p. 89). Mustard does give a brief and correct description of both AM and BWM procedures (p. 90). Unfortunately the author admits that she is too confused by lichen identification to sort out species, so she relies instead "upon the person from whom I buy them". This may explain why the Latin names are misspelled (see essay, p. 4).

Nielsen, Esther. (1977.) *Farging med Planter. (Dyeing with Plants.)*. Copenhagen: Borgan. [See also Wold & Nielsen 1984]. Along with a historiography of lichen dyes, this book is remarkable for its inclusion of more than 60 dye treatises from the 17th century to the present (this is not a 'bibliography' as such but a list included within the text). At a time when many dye books were aimed at the 'dabbler' (see Mustard, above) Nielsen provides historiography. While the author's reference to *Umbilicaria pustulata* as an historical European dye is unusual - and thus of great interest - her opinion that the dye "did not work" calls to mind Lunde's problems with korkje. It also raises the question as to why so many European researchers failed when attempting to make AM dyes? That others have succeeded as I have myself is discussed in my annotation of Almedal 1986. The lasting value of Nielsen is her role in bringing historical works to a 20th century audience (see Rosenberg 1752).

Oakland, Amy. (1973). "On Lichen Dyeing". *Handweaver & Craftsman*, Vol. 24 (March/April), p. 20. Although but a single page in length, this brief article manages to convey more information of a useful nature than do better-known books of the period (i.e. Mustard 1977; Gucciardo 1981); and much later articles written by from a recreational perspective (Ligon 1988). In straight-forward language Oakland correctly describes lichen acids, AM and

BWM procedures, and a 'cold' orchil method. The author also includes a warning against over-harvesting. This little known source deserves recognition for the factual advice it offers.

Pocius, Gerald. (1979). *Textile Traditions of Eastern Newfoundland*. Canadian Centre for Folk Culture Studies, Paper No. 29. National Museum of Man Mercury Series. Ottawa. [See also Doucette 1980]. We have too little information on lichen dyeing in Newfoundland to ignore this academic study of the textile traditions of Irish and Scottish immigrants. A comparison with Bennett 1998 and Shaw 1986 is unavoidable. And while both are more comprehensive in regard to how lichen dyes are recalled in memory, song and verse, we owe Pocius a debt. What he has interpreted is a restatement of the need/necessity" model that is the measure against which we can compare the cultural iconography of present-day praxis (Kålfjord Kommune 1997) and historical practice as portrayed in MacLean and Carroll 1985.

Richardson, David. H.S. (1975). *The Vanishing Lichens: Their History, Biology and Importance*. Newton Abbot: David & Charles. (See also Richardson 1988, 1991). The value here is the context provided; this contribution offers something for academics, students and lay readers alike. Anthropological details, folklore, and pharmacological uses of lichens amplify a concentrated text that juxtaposes scientific data (lichens and invertebrates) with human details (Norwegian lichen troll 'dolls' as the embodiment of good and evil). Although the research done for this book is relevant to the early 1970s, most of the material if not up to date in minute detail is nonetheless thoroughly grounded in biology, and applicable today. Richardson's chapter on dyeing includes a discussion of lichens substances, their biochemical structure, and an historiographical background that includes Edelstein and Borghetty's modern version of the *Plictho* orchil recipe (p. 82). Richardson considers *Parmelia omphalodes* to be the "most commonly collected" lichen in highland/island Scotland and observes that it is still in the early 1970s "very abundant." This is a significant fact for had dyeing continued on a large scale, that would not necessarily be the case. His discussion of AM dyes is one of few references to the use of *Umbilicaria pustulata* in cudbear (p. 87) as a supplement to *Ochrolechia tartarea*. Richardson correctly identifies members of the Gordon family and relates the 'copper boiler story' in a manner that prepares the reader for his version of the historical narrative. Llano 1951 and Kok 1966 appear to have provided the basis for Richardson's account as both are

acknowledged in a bibliography accessible by chapters. Among the photographs here are two images of Marian Campbell (p. 78, 80) taken circa 1971. "Fulling or waulking tweed dyed with lichens" is the caption that shows Campbell doing precisely that. (See MacKay 1976.)

Robertson, Seonaid Mairi. (1973). *Dyes from Plants*. New York: Van Nostrand Reinhold. The claim on the book jacket that she "taught dyeing in more countries than anyone" was in line with Seonaid Robertson's sophisticated approach to natural dyeing as education rather than leisure or diversion, one that sets her work apart from books of this period such as Duncan 1973 and Mustard 1977. Robertson's approach is not recreation but praxis. Her methodology also has a measure of accuracy and authenticity lacking in comparable manuals of the time such as Krochmal and Krochmal 1974. My great interest in the 10 page lichen dye section is that for many years I had only Bolton and Robertson as a guide; and both were adequate for my needs at that time. The disparities in this otherwise reliable text can be traced. For example, Robertson uses on page 104 the exact same spelling, 'crottals', as does the Duchess of Sutherland in Ross 1896, and Hale 1983. That this very particular form of the word occurs throughout her text, combined with her own Scottish origins (although she did not describe herself to me as a Gaelic-speaker), suggest a tendency to borrow rather freely provided the source is ethnically appropriate. Robertson unfortunately perpetuates Jamieson's 1808 use of 'arcel' as one of several common names for the BWM dye made from *Parmelia omphalodes*. Is it merely a coincidence that both Robertson and Jamieson contain an unusual spelling of the incorrect term for crottle? One of the few actual typographical errors in this book becomes an unconscious reference to the author's post-graduate work in psychology when *Hypogymnia physodes* escapes the copy-editor's eye to become on page 105 *Hypogymnia* 'psychodes.' [For a note on a 1982 interview with Robertson see Casselman 1982].

Samuel, Cheryl (Brooks) & Carol Higgins. (1974). *Gentle Dyes*. Seattle, WA: C. Higgins.

Presented in a spiral-bound notebook format (see Merrill & Haight 1975), this book exemplifies the concept of natural dyeing as spiritual escapism aimed at the post-modern 'neo-pioneer'. Poems that speak to "mother earth" are interspersed with phrases such as "Sing the virtues of alum!" in this unpaginated treatise that combines a 'Back to the Land' mentality with nonetheless insightful hints on effective and inexpensive dyes. Although a page-by-page

comparison of the 1974 original and a 1976 "revision" revealed not a single change except that Brooks becomes Cheryl Samuel, the name by which she is more widely known, the value of this book with merely one BWM lichen dye recipe (for *Letharia vulpina*) is that it provides a basis for evaluating a fuller context for dye information included in *The Raven's Tail*. [Samuel 1987]. A comparison of this study with Merrill and Haight 1975, however, indicates that in spite of future scholarship, the reputation of one of the authors is not particularly well-served here.

Sauvé, Paulette-Marie. (1977). *La Teinture Naturelle au Québec*. (Natural Dyes of Quebec). Montréal, PQ: Les Éditions de l'Aurore. One of several Canadian dye manuals published between 1977 and 1986 (see also McGrath 1977, Lathrop-Smit 1978, Casselman 1980; Lock 1981; McGuffin 1986), it is important to include this book for several reasons. One is because it provides a Francophone perspective on modern lichen dye methodologies. As such, Sauvé provides a useful link to examine the extent to which the Quebec agricultural model of lichen dyeing survives as exemplified in Beriau 1933. [There is the 1916 Canadian Handcraft Guild's French language pamphlet as a second example]. One could argue this book also helps to counter the prevailing perception of the Gaelic model as the only tradition in eastern Canada (Bennett 1998). The identification of a distinctly French and rural Canadian tradition as separate from the English Arts/Craft Movement model (Casselman 1980), native dye technologies (McGrath 1977; Turner 1979) and Celtic prototypes (Carlson 1997) is also significant if we are to construct within the subject of lichen dyes an accurate and cogent chronology. And here is the paradox of this book: the author gives a more complete history for imported dyestuffs such as cochineal and kermes than she does for indigenous lichen dyes which are introduced at the end of the book in an 'arctic' Appendix. The book is an odd mix. It begins with a brief section on "ancient dyes" that includes a reference to *Evernia vulpina* (p. 15) and Chilkat blankets (see Samuel 1987). This is followed by a section of historical engravings of dyeing for Gobelin tapestries (unpaginated), after which there are chapters in basic procedures such as fibre preparation and mordanting. A foldout colour section between p. 64 and 65 includes photographs of lichen dyes that are identical in layout and format to McGrath 1977. The similarity here is worthy of comment because it extends to use of the same lichens (identified by Latin name in McGrath, but unidentified in this case); the same colour results (shown on the same small bundles of wool wound precisely the same way); moreover,

lichens and fibre are in both cases photographed in the studio, arranged in circles or patterns that replicate how the lichen on rocks actually occur in nature. "Black leaf" (sic), "Popcorn lichen", "dirty cheeks" and "grey rock lichen" (p. 116-117) relate to the Appendix of the book described as "Un Album de la Spence Bay" book (p. 120- 131), but Latin names would not have detracted from ethnicity. Among the most useful of Sauvé's bibliography inclusions is Soeurs 1941; but she also includes a non-existent version of Bolton (published according to Sauvé by the Brooklyn Botanic Garden in 1973).

Spires, Gillian. (1976?). "A Study of the Brown Dyes from Lichens." Ugborough, Devon: Unpublished monograph. This source from my personal archives is included for three reasons. Spires is a link in the historiography of lichen dyes as a Devon tradition documented in Benfield 1986, Thurstan 1930 and Upton 1990. It remains unclear as to whether Spires was a student of Kok's at Dartington, for such an influence is suggested here in regard to methodology and style. This modest study is thorough treatment that correctly differentiates between 'crotal' (BWM dyes) and 'corkir' (AM dyes) within the context of an investigation that incorporates additional Scottish textile lore. When I met Spires in 1985 she was involved in working out the technical aspects of incorporating lichens not as *pulp* but as *dyes* in paper-making, an application that is uncommon today. Her fairly comprehensive bibliography exceeds that found in dye manuals such as Davenport 1955, and the author includes a timely warning against over-harvesting lichens at a time when the anti-dye lobby was gathering momentum.

Starkey, B.J. (1977). "Dyers threaten lichen flora." *British Lichen Society Bulletin*. No. 40 (May 1977), p. 1-2. Reflecting the heightened tone of the anti-dye lobby in Britain at this time, Starkey makes the point here by using rather stark language: "...the ravages inflicted by a novice dyer who has discovered just how many lichens constitute a weight equal to that of the wool to be dyed, and who has yet to learn that not all foliose species are effectual, are obvious to all." Starkey goes on to address experienced dyers "who appreciate the need to collect only the species that are of use to them (and who) may have read of a method of producing black wool that involves...indigo...and *Lobaria pulmonaria*. It may be," he continues, "that over-collection by pharmacists and dyers...has deprived most Britons of the opportunity of finding sufficient *Lobaria* to try this recipe." Starkey's language provides a useful comparison with

Filson & Rogers 1979, who do not (to the satisfaction of dyers over-sensitive to criticism) draw attention as does Starkey to the commercial lichen harvest for homeopathic medicines and pharmaceuticals. That I have myself seen such medicines labelled as having originated in "South Australia" suggests that Filson and Rogers were remiss in not bringing to public attention this larger exploitation. I must reluctantly agree with Starkey, as well, that the "dyeing dilettanti" are the problem. Too few lichenologists target the commercial lichen harvest which according to a recent informant has decimated the lichen flora of South Australia (Interview with Katrina Syme, Denmark, South Australia, August 27, 1999). To include Starkey in this thesis is one attempt to redress points made in my essay (p. 5).

Tievant, Pascale. (1979). *Historique, Usages Actuels des Teintures aux Lichens. (History and Practical Uses of Lichen Pigments)*. Doctoral thesis. Université de Paris. [See also Antúñez de Mayolo 1976]. A history of ethnic dyes, medicinal uses of lichens, and chemical analysis relative to the structure of dye precursors, are the most useful portions of the only recent thesis on the subject of lichen dyes. The use of older synonyms such as 'Lecanora tartarea' for *Ochrolechia tartarea* and misidentified species ('*Isidium corallinum*' is actually *Pertusaria corallina*) result in a lack of clarity. It is unclear if *Parmelia fuliginosa* or the previous species (or both) yield cudbear, one of several AM dyes the author misidentifies as crotle. Is this a translation problem *per se*? This thesis includes English language literature but language may have affected access. Many of the sources included in this thesis are cited in the bibliography, but among a number of incorrect dates and editions the most glaring is '1961' for Llano's classic 1951 study; nor is there a London edition of Richardson 1975. The confusion here could have been sorted out by a more critical reading of Bolton 1960, Kok 1966, Llano 1951 and Richardson 1975, all of which are cited. The fact that Cooksey 1999 includes Tievant demonstrates how eagerly scholars add to their preferred sources anything written on the subject that has relevance to their own discipline. A thesis should be authoritative; this one may be in chemical terms. What has value in Tievant will be almost certainly overlooked; the illustrations of the lichen scrapers used to harvest orseille d'Auvergne (see Dallon 1997).

Trøllanesi, Katrina. (1972). *Plantuliting. (Plant Dyeing)*. Tórshavn: Færøese Home Industries. This slight but engaging book includes an introduction on Katrina's life, colour

plates of her handwoven rugs, and information on the dyes she used. Accurately-reproduced colour samples include korkje (Recipe No. 28, p. 36) and steinamosa (No. 11 & No. 22, p. 34, 36). Particularly interesting is Trøllanesi's 'jaröarsipu' (No. 14, p. 34), a yellow BWM dye made from *Peltigera* spp.; I compare this with Jensen 1977 and identify 'jardarsipan' as the same yellow dye described from Denmark circa 1752 [Wold & Nielsen 1984]. Thanks to Á. Jóansøku of the Færoese Home Industries, as well as Jensen and Bærentsen, we have a better impression of domestic textile production on the Færoe Islands during the post-war period, gained from primary source material, than is available for comparable regions of the British Isles. This cultural context remains the outstanding value this delightful and unique book.

Turner, Nancy J. (1979). *Plants in British Columbia Indian Technology*. Handbook No. 38. Victoria, BC: British Columbia Provincial Museum. [See also Turner et al 1990]. Like Turner's later work this is a comprehensive and cogent study in botany and ethnology. The section on lichens (p. 47-52) includes tinctorial applications of *Letharia vulpina* that involve inter-tribal trade, and the role of lichens as substitute hair, a ritualistic application with cosmopolitan links [see the photograph of a Papua New Guinea woman wearing lichen "hair" in Richardson 1991]. The value of Turner's work is the methodology in her examination of praxis: "According to one source," she writes, "some coast Salish used a species of *Usnea* to make a dark green dye, and *Alectoria*...with *Letharia vulpina* to make a yellow dye, but this use has not been substantiated by modern informants." (p. 47; compare Antúnez de Mayolo 1976, McGrath 1977, Samuel 1987). Although there are no recipes as such, the information here on the myriad human uses of lichens is one way to alert scholars to a broader appreciation of the diversity of lichen applications throughout human history. Such attention will lead inevitably to a greater appreciation of lichen dyes as a unique form of cultural expression.

Weaver, Richard E. Junior. (1975). "Lichens: Mysterious and Diverse." *Arnoldia* (The Arnold Arboretum, Harvard, MA.) Vol. 35 (3), May/June, p. 133-159. Excellent photographs of lichens are featured in this comprehensive article that deals with lichen biology and ecology. As a publication of Harvard's prestigious Arnold Arboretum, this modest pamphlet would be a fine resource tool for the inter-disciplinary scholar were it not for the information on page 135 that "Harris tweeds still are made with the original lichen dyes." Evidence that supports the

continuation of this cultural misinterpretation is in Armstrong & Platt (1993).

Weigle, Palmy, ed. (1973). *Natural Plant Dyeing - A Handbook*. Special printing of Brooklyn Botanic Gardens *Plants & Gardens* Vol. 29 (2). [See also Gerber & Gerber 1973]. Although only slightly more than half the size of the earlier BBG compilation (see Schetky 1964), this one is more editorially consistent than the first. It also contains outstanding contributions to lichen dyeing: Gerber & Gerber 1973, Yacopino 1973 and Hewitt 1973.

Weigle, Palmy. (1974). *Ancient Dyes for Modern Weavers*. New York: Watson-Guption Publications. A number of dye books have been written using a standardized methodology as a framework. In this case the author subjects twenty-four dyestuffs to a range of mordants that include aluminum potassium sulphate to tannic acid. This is a workable system. But because lichen dyes do not require mordants to use them to vary dye colours (p. 55-56) misinterprets the AM process. That is one of two faults in this book whose strength is a very conservative lichen to fibre ratio (1 ounce of lichen to 8 ounces of wool). Too few dyers have read Weigle critically to grasp how much we owe her for this significant refinement in technique. Unfortunately the value of this is lost when the author processes AM dyes with a 2 week fermentation which in my opinion has an adverse effect on fastness (see McGuffin 1896). Weigle's admission that *Umbilicaria* will produce a "stronger dye if it is left to ferment 28 days" suggests she sensed the advantage in that regard. A minimum of 16 weeks is what I now recommend (Casselman 2000d). The legacy of Weigle's aborted process may live on in Van Stralen 1993. It certainly diminishes the otherwise considerable value of this classic manual.

Windt, Hal. (1970) *Dyeing with Lichens*. New Hazelton, BC: Privately printed. In 1995 Hal Windt assisted by loaning dye pots for my workshop at a Pacific Northwest conference in Prince George, BC, which was the first time we met. When I asked him the original date of this popular handbook he replied "around 1970". The author did report he has produced "several thousands" of these pamphlets, each 'batch' having a different photograph on the front cover. My early edition features *Lobaria pulmonaria* on a pale yellow cover, and a recent one Hal sent me has a cover photograph of lichen-dyed skeins displayed on a fence. Windt recognizes both AM and BWM methods although not by those names. His AM heading is

"orchil extraction" which will confuse readers conversant with more current terminology. The author imparts in 300 words techniques applicable to *Alectoria*, *Lobaria*, and *Umbilicaria*. The value here is an ultra conservative lichen to fibre ratio; in the case of *Umbilicaria*, 2 ounces of lichen to 1 pound of wool. It would require very little effort for Windt to make minor changes in the numerous misspellings that retract from this contribution. A serious flaw is that Windt relies on industrial strength ammonia to produce a blue from *Xanthoria* (see Upton 1990). But the blue sample in my Windt 1970 is now completely white. This faded POD sample allows me to compare Windt's technique using industrial ammonia (McGrath 1977) to numerous samples in my collection done by Bærentsen 1987, Upton 1990, and Anne-Marie Moroney (described in Casselman 2000d) which have not faded. In my opinion industrial strength ammonia may lie at the root of the problem. In recent editions Windt has added a three-item bibliography. One wonders why when dates, locations and publishers names are omitted. With more attention to detail this modest booklet could become a very collectible item of considerable usefulness, as is the case with Merrill & Haight 1975.

Yacopino, Phyllis. (1973). "A Practical Approach to the Use of Lichens." In: Weigle, ed., *Natural Plant Dyeing - A Handbook*. Special printing of Brooklyn Botanic Gardens *Plants & Gardens* Vol. 29 (2), p. 29-33. This article deserves special mention. Like Gerber & Gerber 1973, and Hewitt 1973, it is a commendable piece of work that has been totally ignored within the craft community; nor have I seen it cited in scientific literature. Yacopino presents a cogent methodology for AM and BWM dyes; she provides a biological context for the lichens themselves; a discussion of lichen substances; helpful hints (e.g. lower heat produces better purples); and advice on conservation ratios (1 tablespoon of powdered lichen for 2 ounces of wool). Accompanying the text is an entire page of photographs, one of the finest examples of lichen dyeing ever published in North America. Yacopino uses species that few other dyers have experimented with, including the versatile *Pseudocyphellaria* made famous by Gordon 1980. There are minor problems: the lichen pictured as 'Evernia' (p. 33) is probably *Letharia*. Furthermore, by showing skeins that suggests mordants make a difference in regard to colours the author will tempt the novice dyer to sacrifice the development of technique and substitute a chemical product. An over-dependence on chemical mordants like potassium dichromate sends a message that is unacceptable today. But a more serious oversight is the combination

of mordants used to make BWM greens: to mix ammonia with copper sulphate, iron and tin is surely not to be recommended. The mystery surrounding why Yacopino used such an approach is as puzzling as the tantalizing biographical note inside front cover which claims "her research is leading to a forthcoming book, *Lichen Dyes of the United States*." Such a book was never published; nor have I found any other references to her work.

1980 - 1989

* Almedal, Reidun. (1986). *Korkje*. Thesis. Raulandsakademiet (Academy of Rauland Handcraft School, Telemark, Norway. This survey of the manufacture and trade of korkje is apparently accompanied by a set of dyed samples (pers. com. R. Almedal, Norway, June 25, 1999). Almedal uses reliable Norwegian sources including Lye and Lye 1981 and Høiland 1983. Fluent in English, she includes Kok 1966 but not the standard lichenological references such as Llano 1951, or Richardson 1975. What Almedal brings to the subject is her background in pharmacology and education; this is the basis of her innovative approach. Like Lunde, however, Almedal perceives korkje to be unsatisfactory in regard to fastness. In this paper she attempts to address the problem by using various anti-oxidants and even vitamin C. Nothing in her opinion works to prevent what is described here as the "bad fading" that the author characterises as synonymous with korkje. What lies at the root of this problem? One answer is methodology, for if researchers use Lunde's methods, as Almedal did to some extent, then a satisfactory result is impossible to achieve. A fermentation period of two weeks is inadequate in my opinion; my current korkje experiments show the dye requires more time to develop, a point I discuss in Benfield 1986. Is there a scientific explanation, such as populations of *Ochrolechia tartarea* that contain a lower concentration of substances as is the case with *Umbilicaria*? (See Hewitt 1973). Or is there another answer? Recently in Norway I identified what is possibly another part of the problem; dyers in different regions identify as 'korkje' not one lichen, but a cluster of species that resemble *O. tartarea*. And as Grierson 1986 suggests, some of these (notably *O. parella*) are not as successful because they contain different substances.

Antúnez de Mayolo, Kay. (1989). "Peruvian Natural Dye Plants." *Economic Botany*, Vol. 43(2), p. 181-191. [See Antúnez de Mayolo 1976.] This article includes a blue dye from *Usnea*, a lichen genus not generally associated with that colour (see Windt 1970). New knowledge would be valuable information if it was accurate. But there is a lack of methodological information here which is also the case for *Usnea* in Turner 1979, but she handles apocryphal dye results very differently. Where a cultural context is provided for a specific dye and its particular use (e.g. on hair, or skin), it is acceptable to include very brief references such as those in Hofmann 1997 or Turner et al 1990. But suspicions must be identified. Antúnez de Mayolo exhibits no such restraint in this article where she refers to recipes described in her 1976 thesis. (My annotation of her thesis indicates there are no such recipes.) So what is the value of this list of more than fifty Peruvian dyestuffs that includes *Ramalina* spp., *Teloschistes flavicans* and *Usnea barbata*? Without exception, her dye citations derive from studies where the lichen names are out of date; thus the author's *Parmelia cirrhata* is actually *Everniastrum*. The most remarkable result in the entire dye list, however, is the "dark blue" (p. 189) from *Usnea barbata*. The inclusion of an extremely unusual colour from an unlikely species provokes interest. Esslinger and Egan 1995 claim that *U. barbata* is not a species but one synonym for a cluster of confusing lichens that are frequently misidentified. The peer review process generally involves the inclusion of expertise that prevents such problems. As long as lichens are themselves marginalized, such details will be passed over.

Bærentsen, Gunnvør. (1987). *Liting við Skönum. (Dyeing with Lichens)*. Tórshavn, Færoe Islands: Privately printed. [See Bærentsen 1994]. This 27-page book is a brief but personal account of the author's self-directed study of lichen dyeing motivated by a desire to show Færoese knitters and spinners, in particular, how few lichens are actually needed to make a dye. Bærentsen's 'less is more' philosophy is underscored by AM and BWM methodologies which are derived and adapted from the work of Trøllanesi 1972. The merit of this book is Bærentsen's success in achieving indigo-like blues from the most ephemeral of all dye lichens, *Xanthoria parietina*. With the exception of Moroney in Ireland (see Casselman 1996 c, 2000d) and Upton 1990, no one is more skilled than Bærentsen in using POD dyes. Correct lichen identification, a problem that has plagued other authors, also surfaces here. The author states incorrectly on page 15 that *Parmelia omphalodes* is now known as *Umbilicaria pustulata*.

Three of four colour photographs of lichens are not accompanied by Latin names; a curious exception is *Xanthoria parietina*, a lichen which due to its bright orange colour and circular shape is easy to correctly identify even without an illustration. The author's POD samples and the copious notes that accompany her 1994 translation (KDC archives) are materials of significance in the historiography of Norse lichen dyes. It must also be noted, however, that Bærentsen holds a view of how lichen dye technology passed from the Celts to the Norse that is inconsistent with my opinion and one that defies evidence of a cultural influence that was west to east (Walton Rogers 1993). But the author's 'stranded soldiers' scenario remains a useful discussion point relative to studies where dye technology is passed along by individuals transformed into stranded fishermen (Svabo 1782). The validity of such claims is doubtful if one examines the extent of medieval trade between the British Isles and Scandinavia, described in my annotation of Carus-Wilson 1954.

Benfield, Barbara. (1986). "The preparation of English orchil by George Davy in the 18th century." *Bulletin of the British Lichen Society*. No. 58 (Summer), p. 18-20. The society, based at the British Museum Natural History, published over two years a four part series on orchil. All of these contributions except for this one were written by Albert Henderson. Benfield takes a different approach, however, by drawing attention away from AM dye production centres such as Leeds and Glasgow, in the north, to Devon, in the south. This is an important distinction. Also of significance here is the fact that Benfield is among a handful to note that AM dyes based on *Ochrolechia tartarea* require not three weeks (the standard version of the process in most sources, including Clow and Clow 1952, and Kok 1966), but *three months*. This distinction is important, and yet rarely noted; and its inclusion in this brief article demonstrates the quality of Benfield's research. This contribution is also invaluable to scholars who would balance the many studies of northern British AM dyes with rare evidence of a southern counterpart - a manufacture contemporary with the cudbear patent of 1758. Considering the merit of this article it is particularly disappointing that the author is misidentified as "Barbara Benwell" on the back cover of the *Bulletin*. This is hardly a fit tribute to one whose work has advanced the subject, however briefly, in so a significant manner.

Bliss, Anne. (1981). *A Handbook of Dyes from Natural Materials*. New York: Charles

Scribner's Sons. This is one of several manuals written by an American dyer whose books never contain a bibliography; this is especially frustrating here where the first 30 pages contain generalities such as "Native Americans coloured themselves with chokecherry juice." (p. 6). The second part of the book features the work of other dyers, many of whom use lichens. That one of these dyers is Fred Gerber reflects Bliss's appreciation of his expertise. Regrettably, among the many typographical errors in the book, the most glaring are relevant to Gerber. For example, the page 87 photograph of Gerber's fleece dyed with *Umbilicaria mammulata* shows what is actually a bracket fungus. The same dye fungus is pictured a second time, minus any Latin name, on page 105. Far worse is the fact that nowhere in the text are Gerber's copious lichen dye experiments even mentioned. But it is the lichen to fibre ratios that are the most troublesome. Aside from one warning in regard to the slow-growing alpine lichen *Thamnolia subuliformis* (p. 69), other AM and BWM methods in this book are misleading. Theresa Padgham, a geologist "who has discovered the world of tiny plants" (p. 109) uses *Thamnolia vermicularis* according to a ratio of "1 ounce of lichen to .15 ounces wool". The ratio for *Haematomma lapponicum*, harvested north of Yellowknife (*Ibid.*) is more wasteful: in this case 8 ounces of lichen for 1 ounce of wool. A comparison of these figures with Casselman 1980 or Windt 1970, underscores precisely why lichenologists (Filson and Rogers 1979, Starkey 1977) criticize dyers. Why did Bliss include lichen dyes when her poor opinion of the lightfastness of AM dyes can be traced here to methodological ineptness? In particular I refer here to the 10 day fermentation (p. 70) recommended for species of *Umbilicaria*, an aborted timing which will certainly affect lightfastness. Is this the recipe that influenced Van Stralen 1993? (See also McGuffin 1986). Bliss is an international educator in subject fields beyond dyeing; the ethical problems raised by this book imply a lack of judgement not evident to the casual dyer who may use these flawed recipes to produce lacklustre results.

Brightman, F.H. & J.R. Laundon. (1985). "Alternatives to Lichen Dyes." London: British Lichen Society in association with the British Petroleum Company. It would be difficult to image a more cogent presentation than this reasoned argument against the use of lichen dyes. In a two page 'handout' Brightman and Laundon describe the historical basis for orchil and crottle within the context of the historical dye industry. The authors suggest alternatives in a list of approximately one dozen dyestuffs including beetroot, bracken, dyer's greenweed,

indigo, madder, oak, onion, sumac, weld and woad. Their motivation is clearly a subject of conscience; but their goal is based on the logic that lichens create substandard dyes. I believe this approach is a mistake. Experienced practitioners of dyeing know the fastness of BWM dyes is above average (Bremnes 1979; Grierson 1986); moreover, four of the dyes suggested as alternatives are notoriously light-sensitive. Might it have been more useful to ask dyers directly to avoid over-harvesting, or challenge them to develop less wasteful formulas? There is also a degree of imbalance in regard to the ethical tone (see my essay, p. 5). To describe the Netherlands as the location where the "western world's supply of litmus" is made, and avoid the ethics of industrial exploitation, is unfair to dyers who appear to be singled out for criticism when they use lichens on an occasional basis. Notwithstanding this flaw, I make this pamphlet available to students and include it in bibliographies to support the intent of the authors who have genuinely tried to find a solution. That we have chosen different methods to do this (Casselmann 1992b), confirms that there are various solutions and no excuse to avoid the issue. In the meantime, some lichenologists are adjusting the balance in the ethical debate by addressing as well issues of labour and gender related to the commercial lichen harvest for products such as cosmetics (Moxham 1986) and perfumes (Richardson 1988, 1991).

Brough, Sherman G. (1984). "Dye characteristics of British Columbia forest lichens." *Syesis*, No. 17, p. 81-94. In this, the first of two critical studies by a mathematician and science educator, Brough contends that "no systematic study of the dye characteristics of lichens has been published" (p. 17). Such a claim is difficult to validate according to sources included in this thesis. But the ultimate value of his work is not Brough's historiographical shortsightedness in that regard so much as his contribution of the terms "AFM" and "BWM". Although I subsequently modified "AFM" (see Casselman 1996c, Kadolph 1999), Brough provides a scientific context for lichen dyeing and one that has given scholars a more accurate way to define the two primary dye processes characterized in earlier literature by a confusing array of inappropriate descriptions.

Brough, Sherman G. (1988). "Navajo lichen dyes." *The Lichenologist*, 20 (3), p. 279-290. Brough's two lichen dye studies represent a body of work that remains unequalled in precision and quality. The weakness in this second article is one of philosophy. Brough warns

that dyers "should restrict the use of lichens" because commercial dyes can duplicate "all colours produced from natural dyes." This is a logic similar to that used by Brightman and Laundon when they claim that lichen dyes are not fast. To base ethical arguments on such reasoning is futile when dyers do not recognize such comparisons; for in more than twenty years of praxis I have yet to match a synthetic dye product to my own AM and BWM dyed fibres. This reality is due to the particular lustre and brilliance of lichen dyes, legendary features which contribute to aesthetic value. (See Gardner 1896, Rawson et al 1901). Brough's argument that synthetic dyes are the same is further compromised when he cites a book of doubtful authority in this regard (Rachel Brown, *The Weaving, Spinning and Dyeing Book*; New York, Knopf, 1987.) In this case one wonders if the author was under pressure to make such a claim to verify that there was no sanction of the activity by the journal in question (relevant here is my essay, p. 8, footnote 45). When a scholar relies on a non-authoritative source as the definitive word (which Barber does when she relies on Kierstead as a dye manual), one questions if the opinion cited can be taken seriously? What we can be thankful for in this otherwise excellent paper is overall quality; and Brough's ability to interpret *Xanthoparmelia*, the misidentified Navajo lichen that surfaces in Amsden 1934, Bryan 1939, Grae 1974 and Gucciardo 1981.

Carter, Jenny and Janet Rae, eds. (1988). *Chambers Guide to Traditional Crafts of Scotland*. Edinburgh: W. & R. Chambers. The most famous crotle dyer of the Outer Hebrides is featured in the textile section of this colour-illustrated book. Marion Campbell is shown at her loom, and described as a dyer who still uses lichens to make dyes. As is typical of such recording of 'tradition', no lichen species are named here, nor is the crotle process elaborated upon in this account where the actual presence of lichens in the weaver's studio are meant to imply evidence of praxis. (See MacKay 1976).

Casselman, Karen Leigh. (1986). "Color magic from lichen dyebaths." *Shuttle, Spindle & Dyepot*, XVII (2), Issue 66, p. 75-78. [See also Casselman 1978, 1979.] My aim in this article was to introduce craft dyers in North America to the concept of lichen conservation, and to the work of Annette Kok (Kok 1966) as a definitive source of historical information on the subject. To encourage dyers to become aware of the need for conservation, the magazine's then-editor, Deborah Robson, agreed to publish a highlighted warning: "IMPORTANT NOTE:

please leave undisturbed at least three-quarters of the lichen growth at a collection site." (p. 77). How effective was this warning? Evidence that conservation was a timely and popular concept flooded in; but it came back to me in an odd way as the misappropriation of the 'three-quarters' figure, often cited without credit to the original source, in craft magazines throughout North America and as far away as Britain and Australia. As no such figure previously had been suggested, this feedback was at least an indication that dyers were listening. I did not choose the title of this article, however, which reinforces a 'let's-do-it' modality.

Casselmann, Karen Leigh. (1980). *Craft of the Dyer: Colour from Plants and Lichens of the Northeast*. Toronto: University of Toronto Press. A mistake in the identification of the umbilicate lichens shown on Plate 8 (where *U. mammulata* is actually *Actinogyra muehlenbergii*; and *U. deusta* is in fact *Lasallia papulosa*) was a defining moment. It helped me to understand the importance of lichen identification which as Bærentsen 1987 and Van Stralen 1993 demonstrate, is a lingering problem in craft manuals. It also made me determined to take lichenology seriously so I could identify several dozen species in the field, and learn more about lichen ecology and reproduction. (Many of the collections I later worked on at the British Museum Natural History were annotated by individuals such as William Lauder Lindsay, which fostered my appreciation for the broader historical context of the subject.) The serious approach taken here to what was regarded as a 'hobby' and the conservation philosophy I espoused were noted in favourable reviews as inconsistent with a conspicuous lack of colour in what, at the time, was an expensive book; but two-thirds of the colour illustrations and all of the fifty line drawings I supplied remained unused. In the United States, the book acquired a preferential status due to its high price; but some reviewers were unable to grasp the meaning of the title and subtitle. The geography lesson on the jacket described 'northeast' in the continental sense: that portion of the entire continent that extends from Nova Scotia to Ontario, south to Virginia, and west to the plains. All the lichen dye formulas in this book are fairly conservative but it is here where I misrepresent 'orchil' by applying the name to all AM dye lichens (p. 8). Although I use the term 'boiling water' (p. 168) I should have taken the next logical step and included the word 'method' in the description. (I sensed the need, but did not act on it.) Nor was the stale urine I suggested as an ammonia alternative effective when diluted as I recommended with an equal amount of water

(*Ibid.*). The five page bibliography which included many UK sources, and four indexes, were cited in reviews as unusual in books of this genre (compare Bliss 1981).

Casselman, Karen. (1982). "England and Wales Remembered: Sorting the Slides." *Artisan* (Canadian Crafts Council, Ottawa), Vol. 5 (1), Winter, p. 12-13ff. A research trip to England and Wales in search of Eileen Bolton's life and the legacy of her work is the focus of this article that also includes interviews with Jack Laundon (Brightman & Laundon 1985), Gillian Spires (Spires 1975), Barley Roscoe (Craft Study Centre, Bath), and Seonaid Robertson (Robertson 1973). The polemics of craft are well-illustrated in this article where I describe how Seonaid Robertson reacts when I tell her that she has recently been described, to put it bluntly, as "deceased". (Will this also be my fate in Canada?) Entranced by the landscape on my first trip to England and Wales, this article is admittedly self-indulgent. But it is also the beginning of my determination to provide an historical context for lichen dyeing, and as such, it conveys my appreciation to Laundon who helped me locate the Welsh village where Eileen Bolton lived. My gratitude is also expressed in this article to Annie Jones, a neighbour who spoke little English, but who nonetheless accompanied me to the cemetery where Eileen Bolton was buried only weeks before. I hint at a lack of co-operation from the same British Crafts Council who had Robertson deceased as one reason why I missed the opportunity to meet her in person. Today, however, I see this situation as one of marginalization. What explains how books on Scottish craft enshrine one dyer, Marion Campbell, while another, Eileen Bolton, is throughout her lifetime ignored in her own country?

Chambers, Wendy. (1980s). "Lichen dyeing notes with a selective bibliography for the northern lichen dyer." Whitehorse, Yukon. Unpublished handout. [See also Dean 1994]. From the late 1980s to the mid-1990s, textile enthusiasts from around the world flew to the Canadian arctic to learn about musk oxen fibre and lichen dyes from Wendy Chambers. But where Chambers' contribution to *Dyes From Nature* (Buchanan 1990) is completely devoid of methodology, these notes provide procedural descriptions and information on lichen chemistry and morphology. Notable among her instructions is the use of a "smoked glass" container for processing *Xanthoria* which Chambers keeps from all natural light until she actually begins the process of photo-oxidization; this is a substantial difference between her

methodology and Upton 1990. Given the quality demonstrated here, are these notes the same material Chambers was to submit to Buchanan for the 1990 book? This may have been the case. My own contribution on a comparison of orchil and cudbear was not used in *Dyes From Nature* because it was "too long" (pers. com. R. Buchanan, Lebanon, NH, October 1992). Also, in a pre-publication letter to me Chambers expressed concern that her 1,000- word article would be heavily edited and/or rewritten to conform to the BBG "how to" style. That is likely what happened, with the unfortunate result that these notes are far more indicative of her considerable empirical knowledge than is the disjointed 400-word item in Buchanan 1990.

Chiasson, Anselme & Annie-Rose Deveau. (1985). *L'histoire des tapis "hookés" de Chéticamp et de leurs artisans. (A History of Cheticamp Hooked Rugs and Their Makers.)* Yarmouth: Les Editions Lescarbot for the Société Saint-Pierre, Cheticamp, NS. [See also Chiasson 1972]. The English addendum that accompanies this unpaginated book includes the following description of the extent to which natural dyes were used to make Cheticamp rugs: "It was...a disappointment...that vegetable dyes were not so satisfactory as chemical ones". This offers an interesting comparison to Father Anselme's earlier study in which he describes Cheticamp dyes including lichens. Material culture involves individual and collective memory. That it is inconsistently recorded is typical of the subject, and of the domestic work done by women. This book is an example of such inconsistency. (Compare Bennett 1998.)

Clark, Helen. (1982). "Working clothes of a Færoese fisherman in the late nineteenth century." *Journal of the Costume Society*, Vol. 16, p. 60-70. The significance of this article by a noted costume authority is the reference to a korkje-dyed 'jumper' (sweater) as part of the outfit (p. 66). The lichen dye referred to is identified as *Ochrolechia tartarea*, with credit to the Royal Botanic Gardens, Edinburgh. This valuable reference confirms korkje practice in the Færoes circa 1880. It also provides a useful departure point for a discussion of Bærentsen 1987; or perhaps the reverse is also true, for the garment in question dates from the period when Gunnvør Bærentsen's mentor and friend, Katrina Trøllanesi, was herself the child of a fishing family. There is considerable interpretive value here if this article can be used to revisit the claim made in Lindsay 1868b, that AM dyes are unknown on the Outer Hebrides at this same time, a inconsistency in regard to Clark's data.

Doucette, Laurel. (1980). *Cultural Retention & Demographic Change: Studies of the Hebridean Scots in the Eastern Townships of Quebec*. Canadian Centre for Folk Culture Studies, Paper No. 34. National Museum of Man Mercury Series. Ottawa. [See Pocius 1979]. Too few Newfoundland references mean we cannot overlook this contribution where crottle is a "moss" (p. 72) by an informant whose recollections of the domestic textile process are transcribed from a taped interview. This standard approach to folk culture identifies issues of marginalization and inconsistency I raise in Fenton 1978 and Shaw 1986: lichen dyeing suffers in the hands of folklorists unless the scholar involved makes an attempt to provide a botanical context. This is also the problem with Carlson 1997. A comparison with two recent studies, however, should inspire confidence in this regard (see Shaw 1986; Bennett 1998).

Fraser, Jean. (1983). *Traditional Scottish Dyes and How to Make Them*. Edinburgh: Canongate 1983. The value here is limited to the bibliography, but even this statement must be qualified. In the citation for "McLagan, Dr." Fraser omits his initials, misspells his name, and includes no page numbers for this or any other article in a bibliography that at first glance offers interesting archival material. This is an ethnically-particular study that for some reason continues to be reissued. It is popular with non-critical readers who enjoy the theme, have not noticed the unevenness, nor the considerable disparity between this book and one similar in size and scope, Wickens 1983. These are also readers who do not notice that Fraser cites non-existent imprints (there is no Bolton edition from 1963) and her "Videtta" is Violetta Thurstan, both of which errors occur on page 106. The discerning reader who values Grierson 1986 finds other anomalies in this Scottish text. Fraser includes the fictitious red dye from dandelion in her colour results list while at the same time she claims there is no recipe, and confirms she has not tried to make the dye. Fraser's cudbear recipe would be impossible to follow as written; nor is her BWM brown dye from *Cladonia rangiferina* verifiable. That the author justifies the vague recipes in this book as due to women's secrecy may, however, touch on an issue I raise in Stronach 1940. More troublesome is Fraser's motivation in dye historiography which is retrogressive even in the 1980s. Dyeing is a practice she recommends on the grounds that it is "a simple craft which can be fun, and yet does not require much skill to do." (p. 2).

Goodwin, Jill. (1982). *A Dyer's Manual*. London: Pelham Books. Goodwin's strength is

her educator's eye, and her experience as an ethnologist. Both are evidenced in this popular manual long out of print. Her lichen dye section contains minor problems; it is more useful as reading material than a guide, a distinction that is not true in regard to Goodwin's considerable expertise with woad and indigo. But Goodwin observes that she "would strongly query the often-quoted allowance of equal weights of [lichen] dyestuff and fibre" (p. 89). Her repetition of a red dye made by "Scottish highlanders" (*Ibid.*) is uncited, but an AM method that involves the wool fermenting *with* the lichens may represent a misinterpretation of what is actually a contact dye that produces not 'red' but a BWM 'reddish brown.' (See Smith 1921).

Gordon, Flo Ann. (1980). *Dyeing with Sticta Coronata, New Zealand's King of the Dye Lichens*. Roseburg, Or: Privately printed. This monograph is a valuable reference tool widely available when lichen dyeing was gaining recognition as a distinct praxis. Its strengths are mitigated by ethical problems. The complexity of this issue, contained in this case in a publication of incomparable methodological completeness, warrants attention. Most troublesome is the fact that the author advises that she sells New Zealand lichens from her Oregon home (p. 41). Nowhere is there a clue as to how and why Gordon gained access to a steady supply of the lichen today known as *Pseudocyphellaria crocata*. The author refers to a prodigality that allows a sufficient amount to sell, but she also hints that her reports of this abundance are second-hand (p. 7). On the plus side Gordon does state that this popular dye lichen falls to the ground which is how she claims New Zealand dyers first came to discover its remarkable dyeing properties. And she is correct in that description, for among the lichens I have experimented with, few yield both AM and BWM dyes. This is true for *P. coronata* and the range of colours produced is also outstanding. Gordon's reliance on mordants such as potassium dichromate to produce colour diversity is a problem because she at no time advises care in handling such products. How does one balance these weakness with a brief but comprehensive history of lichen pigments; references to Bancroft, Bolton and Hale; a firm grasp of the chemistry of various lichen substances; and procedural descriptions that surpass those in any other source published between 1970 and 1990, including my own work? This book is full of contradictions and insights. Gordon is entirely correct when she states that the usual lichen reagents will not produce the standard chemical reactions when used with *P. crocata* (p. 14). She describes other lichens used to make AM and BWM dyes that also defy

such tests (*Ibid.*) This depth of detail is missing in virtually every dye manual in this thesis. On a humorous note, Gordon's version of how orchil lichens were 'discovered' by Federigo is provocative. In Casselman 2000d I suggest the Italian nobleman, a crusader, likely took a purple dye master from the Levant home with him. In Gordon's account Federigo "is said to have" discovered the secret while travelling in the Levant " (p. 11) and " was forced to relieve himself on beaches where *Roccella* was growing" (*Ibid.*) This narrative is certainly more colourful, but is this author aware that *Roccella* occurs on vertical cliffs, a detail which would require considerable ingenuity and agility? Few contributions to the subject are more rewarding to read, or more complex and troublesome in regard to the ethical issues raised.

Grierson, Su. (1983). "Dyeing with conservation in mind." *Edinburgh Guild of Weavers, Spinners & Dyers Magazine*, Summer Edition, p. 5-8. [See also Grierson 1984, 1986]. This informal article by a dyer who has made a considerable contribution to the historiography of lichen dyeing is focused on the issue of lichen conservation. Grierson offers cogent advice; she urges would-be lichen dyers to read first, then take the books into the field to insure correct species identification. In regard to textile guild or group activities that involve lichens, the author makes an ethical distinction that is not always appreciated by dyers; that field trips where 'identification' is the goal (see Casselman 1980) are sanctioned; but unacceptable in her mind, and I agree, are 'collection' field trips that are potentially exploitive when dyers hike en masse for the sole purpose of gathering lichens.

Grierson, Su. (1984). "Vegetable dyes of Scotland." *Journal of the Society of Dyers and Colourists*, 100 (July/August), p. 209-211. [See also Grierson 1986, 1989; Grierson, Duff & Sinclair 1985a, 1985 b.] This is the first of three comprehensive articles Grierson wrote and co-authored during this period, all of which remain little known in craft circles. Here Grierson hypothesizes that inaccurate colour naming is the problem faced when analyzing dyes in 17th and 18th century Scottish tartans. Textile specialists who peer review articles are unaware of the currency of Latin nomenclature, a fact born out by Grierson's use of the older synonym *Umbilicaria pustulata* to describe a lichen that is in fact *Lasallia papulosa*. Nor does Grierson analyze her AM and BWM lichen dye findings in this article that includes a chart of seven lichen dyes. What she does offer is a compelling argument in support of the value of natural dye

research including (presumably) studies on lichen pigments. Published in the same journal as Perkins 1986, this article cannot be compared with the later one in regard to scope and depth of analysis. What it indicates, however, is that Grierson has much to offer within her perspective as an actual dye practitioner. She makes good on that promise in subsequent work.

Grierson, Su. (1986). *The Colour Cauldron: The History and Use of Natural Dyes in Scotland*. Tibbermore: Privately printed. [See also Grierson 1983, 1984, 1989; and Grierson, Duff & Sinclair 1985a, 1985b]. The strengths of this book are Grierson's coverage of a variety of British dye species, an extensive bibliography, and historical information on the role of crotle and cudbear as domestic and industrial dyestuffs. This is a well-researched and cogent book that is deservedly popular. Grierson succeeds admirably when on page 27 she introduces the work of Taylor and Walton to a craft audience. Her lichen conservation advice is scientifically sound and well-considered in regard to her audience, one that includes craft dyers and textile scholars. She also makes a valuable contribution by debunking two myths; one involves the notion that urine collected from beer drinkers (p. 29) produces the best cudbear, a much-touted misconception that persists to this day. Also important are Grierson's tests that lichens harvested in summer do not appear to contain more dye potential than those collected in winter (see Casselman 1978). In such an excellent book it is unfortunate that Grierson yields to the temptation to perpetuate as many myths as she debunks. There is no persuasive botanical or chemical context to support her claim that cudbear is "very fugitive". This notion (like the urine from beer drinkers) reinforces an unfortunate historical stereotype (Gardner 1896). What is required instead is an explanation of how the addition of umbilicate lichens (which contain different acids than *Ochrolechia tartarea*, and thus require longer fermentation), spoiled '3 week' cudbear, a point I discuss in Benfield 1986 and Bliss 1981. A more serious problem is uneven scholarship. There are a number of unsubstantiated statements here. The paucity of information in the documentary record in regard to 17th century BWM dyes - a scarcity identified by Grierson et al 1985a - means she must provide a citation to accompany her claim that the traditional method of making Scottish crotal (BWM dyes) "...has been recorded by writers from the 16th century onward" (p. 172). No such source is provided. Among the author's considerable strengths are extensive empirical knowledge and her analysis of the magenta from *Taraxacum officinale*, which she and I both agree is a myth.

(pers.com. interview, Tibbermore, August 1986).

Grierson, Su. (1989). *Dyeing and Dyestuffs*. Shire Album # 229. Aylesbury, Bucks: Shire Publications Ltd. [See also Grierson 1986]. Excellent historical illustrations of considerable significance highlight this 32-page booklet. Outstanding is the page 24 photograph of William Lauder Lindsay's "large, leather-bound record book" - the very book I describe in my preface. I knew nothing of this sample book until I purchased *Dyeing and Dyestuffs* in 1992. I telephoned Grierson to find out how to arrange to see it. Later attempts to locate the Lindsay record book at the University of Leeds Library were successful, but by the time I accepted the offer to read it, this incomparable manual had been lost. We owe Grierson a debt for including this illustration. The only other known photograph of Lindsay's sample book is in a Swedish lichenological text, Moberg and Holmåsen's *Lavar. En fälthandbok* (Stockholm, 1990).

Grierson, Su, David G. Duff & Roy S. Sinclair. (1985a). "Natural dyes of the Scottish highlands." *Textile History*, 16 (1), 23-43. Journals are full of rewritten research but in most cases new data are included, or innovative insights relative to a particular point. The authors here claim to focus attention on 17th century native Scottish dyestuffs and the information gleaned from historical accounts makes for interesting reading. But this article clearly contradicts comments made by Grierson's in her 1986 book. Page 24 of this article claims "There are virtually no *authentic* records of dyes...used in Scotland in the 17th century." (The italics are mine). Compare this comment with the statement on page 172 in Grierson 1986 where the author claims, without the support of a citation, that crotle dyes have been recorded "since the 16th century onwards" (My italics). The real value of this article is the list of dye results from 17 lichen species that are less well-known than cudbear and crotle, including *Umbilicaria torrefacta*. These lesser known dye species draw attention to the fact that there are not merely a handful of AM or BWM dyes, but dozens of vernacular variations (100 species from many countries are recorded in Casselman 1996c).

Grierson, Su, David G. Duff & Roy S. Sinclair. (1985b). "The colour and fastness of natural dyes of the Scottish highlands." *Journal of the Society of Dyers and Colourists*, Vol. 101 (July/August) p. 220-227. In a paper shows results from 175 Scottish dye plants, and one that reflects the chemical expertise of her co-authors, it is disappointing to find only three

lichen dyes included as the basis for a discussion on lichen chemistry that is vaguely inconclusive. Lightfastness is increasingly popular as a topic for journal articles, but the laboratory conditions to which fibres are submitted for testing are in no way reflective of actual environmental conditions. It is stated here that no humidity control was attempted; yet moisture is a factor in fading (pers. com. S. Kadolph, Steuben, Me., August 1998). The authors report lichen purples "show a dramatic colour change", but they include only two AM dyes (p. 221) on which to base this conclusion. Nor is there any methodology here in regard to the specific AM techniques used; nor are AM methods analyzed. What is included is the biochemistry of "mauve colours from lichens" (p. 225) and a concise and effective description of lichen dye chemistry. We need such information, but it would have been far more valuable had the authors identified specific species and fully described their AM methodology. What I am suggesting is that a too short fermentation period may have compromised their results, for Grierson does not identify the need for AM dye fermentation beyond a period of three weeks (*The Colour Cauldron*, p. 180). "Mauve" rather than "purple" is a clue in this regard (see McGuffin 1986).

Gucciardo, Linda. (1981). *Native Dye Plants: The Iowa Dyer's Handbook*. Cedar Rapids, IA: Privately printed. When a book devotes a single page to lichen dyes it is impossible to include sufficient information to identify and address the ethical issue. Nor is it possible to encourage conservation when one of the two lichens featured is misidentified: the author's "Parmelia molluscula" is, in fact, a misspelled and misidentified species in North America according to Esslinger and Egan 1995 (see Brough 1988). Lichen dye recipes of this type reflect inadequate original research, a phenomenon that is also apparent in trade published books. I have included Gucciardo as a locator along the 'misinformation' trail that winds from Amsden 1939 to Bryan (Young) 1940, to Grae 1974, and presumably from her, to Gucciardo.

Hale, Mason E. Jr. (1983). *The Biology of Lichens*. Third edition. London: Edward Arnold. The use of "crottal" (p. 130) to describe dyes made from *Ochrolechia tartarea* identifies in this classic lichenological text the lingering problem over dye names and etymology. Llano 1951 makes no such misinterpretations in regard to the name of a domestic lichen dye; nor does Richardson 1975. Given Hale's assistance to lichen dye studies (Bolton 1960, Perkins 1986), and his familiarity with the subject on that level, this lapse underscores the subtlety of literature

problems. It is inconceivable that a lichenologist of Hale's expertise would misidentify lichens used in perfumery, or misinterpret their common appellations. As in folklore (Fenton 1978) and history (Grant 1961, Jenkins 1969), accuracy and detail applied to other aspects of a subject are lacking when the topic is perceived to be as arcane and obscure as *domestic dyeing* (compare the *industrial orchil* reference below).

Hale, Mason E. Jr. & Mariette Cole. (1988). *Lichens of California*. Berkeley: University of California Press. [See also Hale 1979]. Any book that helps dyers identify lichens is a valuable aid, and this guide offers keys accompanied by illustrations. It is also one of few references that identify the 19th century lichen dye trade in Baja California based on semi-tropical species such as *Roccella babingtonii* and *R. fimbriata*, a little-known industry also described in Perkins 1986. Particularly useful here are descriptions of lichen substances and diagrammatic structures of depsides and depsidones which are BWM dye precursors. These authors include some of the detrimental effects of lichens which with few exceptions (Richardson 1975) receive less attention than do the useful attributes. Perhaps the most memorable feature of this book, however, is a gross error. The cover image of *Letharia vulpina* is upside down. It is inconceivable that this would happen in a field guide to wildflowers or trees (essay, p. 15). Also of value to dyers is a warning that does not occur in Hale 1979, namely, the advice that the reagent paraphenylenediamine is "potentially carcinogenic." (p. 23)

Henderson, Albert. (1984/1985). "The industrial manufacture of lichen dyestuffs." *Bulletin of the British Lichen Society*, No. 55 (Winter 1984, p. 19-21); No. 56 (Summer 1985, p. 22-24); No. 57 (Winter 1985, p. 12-14. [See also Benfield 1986]. In this short but valuable series a lichenologist and historian records 18th and 19th century lichen dye memorabilia from the industrial heartland of Britain. The chronology, however, is confusing. No. 55 describes the early 19th century origins of the Yorkshire Chemical Company (who sold cudbear and orchil), but No. 56 includes copies of letters written to the Gordon family of cudbear fame, circa 1758-1787. No. 57 continues the Gordon saga with Henderson's vivid description of "five books...each one of one hundred and seventy-six specimens of beautiful and elegant [cudbear] dyes...". It is to the author's credit that he laments the apparent loss of these sample books

to modern research: "What a significant exhibit these books would make in any museum", he writes, "had they only survived today." Of considerable cultural and economic significance here is the 1980s photograph (attributed to D.J. Hackett) of the 'Cudbear Street' sign that was apparently still in place in Leeds at that time; and a photograph of a 1920 Leeds Ordnance map showing the location of not only the Cudbear Street, but also 'Orchella Place'. Henderson is correct in his assessment of the great value of this external and physical evidence which is now lost to scholarship.

Hoad, Judith. (1987). *This is Donegal Tweed*. Inver, Donegal: Shoestring Publications. That there is no comparable book written on Harris Tweed makes this book one of those rare finds, an above-average yet non-academic study that is comprehensive, yet literate. (Compare Jenkins 1969). It is inconceivable that no commercial publisher recognized the value of this book which examines Donegal Tweed 'from the inside out'. Based on first-hand accounts of industry insiders Hoad brings to this examination of lichen dyeing for Irish Tweed a level of credulity and veracity missing in Clifford Gulvin's *The Tweedmakers* (Newton Abbot, New York: David & Charles; Barnes & Noble, 1973) and in Jenkins 1969. Hoad's lichen dye section is rich in detail, a mixture of history and praxis based on her own experience as a dyer. One of few to obtain a green from a BWM lichen, *Hypogymnia physodes* (p. 32), Hoad also utilizes lesser known species such as *Parmelia fuliginosa*. Her opinion as to why lichens were mixed in dye preparations may differ from my own for Hoad finds the "deficiencies" of one "were compensated for" by the inclusion of another species (p. 32); this contrasts with my findings in regard to the historical harvest where the mixing of dissimilar species was the result of carelessness, or economy. But it is her description of the Donegal Industrial Fund and Mrs. Ernest Hart's role in fostering natural dyes that is the author's main contribution to the narrative of lichen dyeing in northern Europe (see Ross 1896, MacKay 1900). Hoad is exemplary in how she acknowledges and credits her informants and sources (p. 168-169), a lesson one wishes others would apply. At a time when many aspire to 'pass along traditional knowledge' of lichen dyes (i.e. Fraser 1983; Simmons 1985), few achieve what Hoad and Grierson accomplish. That less discerning authors find a commercial publisher while noteworthy books do not, may account for why dyeing as a field of study has lagged behind knitting, spinning and weaving.

Høiland, Klaus. (1983). "Laven korkje, *Ochrolechia tartarea*, som fargeprodusent. (Dyes produced by korkje, from the lichen *Ochrolechia tartarea*.)" English abstract. *Blyttia*, Vol. 41, 17-21. The 'mosegrev' or lichen scraper illustrated in this article (p. 20; see Tievant 1979) was motivation for the Norwegian research described in Casselman 1993d & e. This article by a well-known mycologist surpasses Lunde 1976 in its relevance. Høiland provides an historical context by citing an early korkje record in a 1316 document of King Hakon V Magnusson. He traces Norwegian korkje throughout the Renaissance period up to and including the present century. "The collection and sale [of korkje] was a welcome income for the poor population living in the interior of the Lista peninsula," he writes (p. 21), providing further evidence of the poverty model (Høag 1976, Vågen & Engelskjøn, forthcoming). Based on *O. tartarea*, korkje and cudbear were identical products, and the trade brought Jochum Brinch Lund the same prominence as the Gordons (Gordon 1786; Casselman 1996c). Lund build a home near Flekkefjord, an imposing structure which is today the Farsund town hall (pictured in Casselman 1993e). A structure of this grandeur as a family home indicates the profits involved in the dye trade. Høiland cites annual export figures of 20,000 kg.; one wonders if this article had been available to Lunde in 1976, would the documentary record of the magnitude of the commercial korkje trade have made any difference in her perception of korkje? Høiland's achievement is an historiography that provides evidence to counter those who perpetuate the fallacious notion that AM dyes 'disappeared' after the fall of Rome. The weakness in this article, however, is that Høiland, like Lunde, does not achieve a red or a purple dye. To answer the question I harvested *Ochrolechia tartarea* (July 1, 1999; Kabelvåg, Lofoten Islands, Norway) and prepared korkje *in situ*; the dye was subsequently brought back to Nova Scotia. After a six week fermentation period (not the 3 weeks others claim; see Benfield 1986), I made a korkje dye bath at the Humboldt Institute Natural Dye Seminar. The wool I dyed using korkje is a rose-red colour that does not approximate the more intense purple obtained from dyes made from *orsallia* (umbilicate species). This fact is the basis of my contention that umbilicate lichens such as *Lasallia pustulata* (and/or similar species: see Taylor & Walton 1983) were also included in vernacular orchil-type AM dyes of northern Europe. (See Casselman 1996c, 1996e, 2000d).

Laundon, Jack R. (1986). *Lichens*. Shire Natural History Album # 10. Aylesbury, Bucks: Shire Publications Ltd. [See also Brightman & Laundon 1985]. Laundon is one of the few

who realize that *Roccella tinctoria* is misused as a collective name for various species of this genus that provided the bulk of lichens used historically in the commercial dye industry. This book describes that industry in succinct terms, yet the author states unequivocally that craft dyeing as an activity "should be discouraged" (p. 22). In light of the problems in some dye manuals (essay, p. 7) it is hard to argue otherwise. But it is wrong in my opinion to target only dyers with this ethical message. The commercial harvest of lichens for cosmetics must be noted in books such as this if dyers are to take seriously these well-intentioned warnings. Here Laundon's directions on how to transplant lichens and observe growth rates is indicative of his lively intellectual curiosity that extends to legitimate dye studies and historiography.

Ligon, Linda. (1988). "On the Rocks". *Handwoven*, Vol. IX, Issue 5 (November/December), p. 107. Here the publisher uses her own magazine as a vehicle for a very personal statement about lichen dyes that is typical of earlier treatments where lichens are "Unassuming little crusts" and "gifts from the rocks". And while this item has little to recommend it as an instructional guide, it is remarkable for other reasons. It highlights the persistent romantic tone of lichen dye information in a magazine that reaches a worldwide audience at a time when studies in other American craft publications had taken a more serious approach (Casselman 1986). It also underscores the merit of much earlier contributions that remain little known and under-valued (Gerber & Gerber 1969, Oakland 1973).

Liles, Jim & Fred Gerber. (1987). "Dyes of the Ancients and of our Ancestors". Exhibition catalogue. Oak Ridge Community Art Center, Oak Ridge, Tennessee. Few dyers today have a greater command of praxis than these southerners, one of whom has since died. And while the exhibition *per se* featured more of Jim's work than Fred's, the catalogue reflects Gerber's inquisitive musings into aspects of civilization generally ignored by dye historians. Here are comparative biochemical diagrams of dyestuffs such as murex and *Xanthoria parietina*, although the latter is not mentioned as such in the text. There is also a discussion of how murex was extended by incorporating orchil (Caley 1927). Liles and Gerber describe murex/orchil combinations as "possibly the first violation of pure food and drug adulteration laws" (p. 4), a clever observation shared by Grieve 1931. The dates of 1400 BC for the origin of AM lichen dyes and murex, however, have since been significantly altered (Perkins 1986).

Lock, Carolyn. (1981). *Country Colours*. Halifax: Nova Scotia Museum. The value of this book is the author's reliance on archival sources to reconstruct the availability of imported dyestuffs in Nova Scotia before 1856. The issue of veracity in lichen dye recipes centers here on a red dye from *Cladonia cristatella*, which minus method or recipe is attributed to "an older resident of New Ross, Lunenburg County" (p. 38: compare McGuffin 1986). While she avoids the "is said to yield" phrasing, Lock's reference lacks authority. It would have been far better had she used the approach demonstrated in Turner 1979, a descriptive method which states that a citation is unsupported by evidence. However unintentionally Lock perpetuates lichen dye mythology in an otherwise useful historiography. Substantial stocks of this inexpensive book are still available, and so yet another reference to orchil as "unknown" in Europe "until about 1300" (p. 39) will survive into the next millennium.

Lye, Gerd Mari & Kåre Arnstein Lye. (1981). "Farging med Lav". ("Dyeing with Lichens"). *Nyttevekstforeningens Småskrifter* # 8, p. 1-22). A comprehensive bibliography that includes a number of scientific studies on lichen biology and chemistry is combined here with line drawings and a useful text. My first question when we met in 1992 was to ask why there was no reference to korkje or other AM dyes. "Because they fade" was the answer that suggests once more the impact of Lunde 1976 and the verbal influence of her work. What Gerd Mari did achieve was a prodigious sampling of more than fifty BWM lichens. Although not all are included in this publication, there are recipes for *Alectoria* sp., *Cladonia rangiferina*, *Evernia prunastri*, *Hypogymnia physodes*, *Haematomma ventosum*, *Lobaria pulmonaria*, various species of *Parmelia*, *Pseudevernia furfuracea*, *Usnea* spp. and *Xanthoria parietina*. This article makes mention of Bolton's blue from the latter species but the authors neither explain their non-blue result nor include Bolton in an otherwise comprehensive bibliography that includes such notable texts as Culberson 1969 and Westring 1805.

MacLean, Malcolm & Christopher Carrell, eds. (1985). *As an Fhearann (From the Land): Clearance, Conflict and Crofting, A Century of Images of the Scottish Highlands*. Edinburgh, Stornaway & Glasgow: Mainstream Publishing; an Lanntair; Third Eye Gallery. This catalogue of a seminal exhibition on the people and history of highland/ island communities includes a photograph of crotal-collecting provided by the School of Scottish

Studies, an illustration that in my opinion conveys a mistaken impression of the activity. This image of a South Uist man harvesting lichens, and a Harris photograph of women and children engaged in the same activity (Sutton & Carr 1980) raise questions in regard to the misappropriation of ethnicity and gender which in my opinion serve the purposes of cultural tourism (MacKay 1976). Furthermore, and equally significant in regard to cultural veracity, the text below the photograph perpetuates a notion that lichen dyeing continued well into the present century: "Crotal is the foundation in tweed of nearly every colour." (KDC emphasis). The use of the present tense here is a significant effort in cultural verification which when artificially enacted, as here, distorts the reality and contributes to misinterpretation.

Mahon, Brid. (1982). "Traditional dyestuffs in Ireland". In: Alan Gailey, ed., *Gold Under the Furze: Studies in Folk Tradition*. Dublin: Glendale Press. P. 115-128. Among earlier contributions to the subject of Irish lichen dyes are Boland 1904 and Ryan & O'Riordan 1917, and both exceed the value of this chapter. The context of this study, contained within an authoritative book on Irish material culture, leads one to expect more. Where folklore and mythology are concerned, Mahon does not disappoint with reference to O'Curry 1873 and manuscripts from the Irish Folklore Collection. The author correctly applies crotle specifically to *Parmelia omphalodes* and *P. saxatilis*, yet she falls into the trap of names which are neither explained in etymological nor botanical terms (i.e. "carker," p. 117). The author attributes to a single lichen identified only as "growing on rocks" dye names such as "arcel" (p. 119) and "archil" (p. 127) that compound the problem of AM dye names applied to BWM dyes. Folklore references to dyeing are the root of an interpretive problem identified in my annotation of Fenton 1978 and Jenkins 1969. On balance, Mahon's interpretation of northern murex indicates that here she is on solid ground with a cogent and focused discussion.

McGuffin, Nancy J., ed. (1985). *Spectrum: Dye Plants of Ontario*. Concord, ON: Privately printed. One of few Canadian dye books published during the decade (Casselman 1980; Lock 1981) this valuable project instigated by the Burr House Spinners and Weavers Guild is remarkable for its breadth and depth, qualities lacking in earlier sources such as Lathrop-Smit

1978. The ten page lichen dye section (p. 282-292) is botanically and typographically accurate. With one exception noted below, nowhere is there a conservation note. That there is no specific warning against over-collecting *Lobaria pulmonaria* which this book describes as "infrequent in Ontario" (p. 282) is an oversight. (Is this a case where 'infrequent' is meant to imply that dyers should not take too much? See Starkey 1977). The AM methodologies used in this book do not allow for the full development of orcein which requires far more time than is allocated here (see Bliss 1981, Shippenberg 1994). This explains the disappointing "rose-tans" and "greyed-pinks" from *Lasallia papulosa* and *Umbilicaria mammulata* rather than "the expected reds" (p. 285). But the Burr Guild excels in BWM techniques, and this is the value here. They include lesser known species such as *Pseudoparmelia caperata* and a "sun activated" *Stereocaulon paschale* (p. 201), but more information on what appears to be an unusual process would have been helpful. (Compare POD dyes in the Appendix). Burr House dyers also use *Xanthoparmelia conspersa* and *X. taractica* which yield a beautiful copper-rust similar to the colour produced by *Parmelia omphalodes*. More authors should follow the lead of Burr House and focus attention on common species where there is less risk of over-harvesting; among these BWM dye lichens is *Hypogymnia physodes* (see Casselman 2000d) which is sufficiently abundant throughout North America to qualify as 'weedy.' I am also grateful to McGuffin et al for testing *Cladonia cristatella* (see Lock 1981) and *Cladonia pyxidata* (see Kok 1966 & Weigle 1973). Only with such experimentation can we disprove the 'red' myth associated with each of these lichens which here give "soft beige" and "gold."

Moxham, Tim H. (1986). "The commercial exploitation of lichens for the perfume industry." In: E. J. Brunke, ed., *Progress in Essential Oil Research*. Berlin & New York: Walter de Gruyter & Co., p. 491-503. This comprehensive survey describes the commercial harvest of *Pseudevernia furfuracea* in France, Yugoslavia and Morocco. It provides a telling glimpse of the life of the 'pickers' within the context of a Marxist philosophy that identifies the paradox of the labour when compared to the inflated value of the products so made. This message is a valuable one in regard to the ethical debate, as suggested in my thesis essay. The discussion

has up to now avoided troublesome social issues such as those raised here.

Moxham, Tim H. (1982). "The use of lichen-scrapers for gathering 'Oakmoss'". *Bulletin of the British Lichen Society*, No. 50 (Summer 1982), p. 18-19. Moxham describes lichen-gathering tools used to harvest *Pseudevernia furfuracea* in present-day Yugoslavia. These agricultural implements offer a comparison to the historical scrapers illustrated in Høiland 1983, Richardson 1991, and Tievant 1979. This article is also included because there are few modern references that link lichens to agriculture, a useful means of describing the labour involved and assessing its economic value and productivity (Dallon 1997). Moxham's opinion on hegemony and rural labour are of considerable importance, as indicated above, for he notes both the nature of the workforce and the marginalized status of the workers who earn "a terribly low rate of pay". Socially-concerned scientists of this genre provide an example to those who would censure craft dyers while they also ignore the human and botanical exploitation that characterizes the modern trade.

Perkins, Patricia. (1986). "Ecology, beauty, profits: trade in lichen-based dyestuffs through western history." *Journal of the Society of Dyers & Colourists*, Vol. 102 (July/August), p. 221'-227. [See also Kok 1966]. There is a tendency with Perkins and Kok to compare them for both are of incomparable value. Certainly Perkins, then in the Department of Economics at the University of Toronto, relied heavily on Kok. But rather than an historiographical chronology of methodologies and trade which comprise Kok's study, Perkins' approach is to focus on the ecological aspects of depletion and show how it was linked historically to the supply cycle. Perkins is the first scholar to include an analysis of 'puh' (Forbes 1964) and thus conclude "Orchil was known to the early Akkadians" (p. 222). The author does not identify the Akkadians as a Babylonian culture extant circa 2350 BC although this is the basis of her claim that AM dyes are a tradition spanning 4,000 years. A linguist, Perkins also delves into Spanish archival sources to present a persuasive argument that Gaetolian purple was a dye based not on murex, but on orchil. To support her argument she provides as evidence "...the heaps of murex shells characteristic of other areas where the mollusc purple industry flourished" which are she claims are "absent in North Africa and the Mogador Islands, the centre of the Gaetolian industry." (p. 222). Perkins offers as further evidence the fact that *Roccella* is

abundant today in these same areas whereas molluscs are uncommon, an argument which I find can also be interpreted as evidence that molluscs may never have recovered in areas where they were over-harvested in the more recent past, for use as food. Perkins uses an economic and linguistic interpretation to link the supply crisis for both orchil and murex directly to the ecology of both organisms which according to her hypothesis, explains the peaks and lows of the dye trade throughout history. This is a compelling argument that refutes those who perpetuate the unsupportable claim that orchil 'died out' after the fall of Rome. For Perkins to state this *again* (see essay, p. 15) should put the issue to rest once and for all. Her work also discredits the fiction that orchil was too inferior a dye to have been manufactured other than as a faux murex. The value of Perkins' ecological and economic perspective is that she demonstrates such assumptions are simply not valid. Just as Bolton sought lichenological advice, Perkins consulted Mason Hale, and his comments offer a fascinating perspective on the ethical debate. "Frankly," Perkins quotes him as saying, "I have never considered the decimation of lichens collected for dyeing, but my gut feeling is that there must have been episodes of serious depletion." (p. 223; compare Filson & Rogers 1979; also relevant here is my comment in Richardson 1975 on the regrowth of Hebridean *Parmelia omphalodes*). Just as Kok's conjecture that AM dyes were extant during the pre-medieval period is now supported by abundant archaeological evidence, Perkins' concept of the medieval lichen dye industry in orchil-type dyes as a widely-based trade that extended far north of Italy is important in the rewriting of textile historiography. Moreover, her views are supported in this thesis by my analysis of additional English (Furley 1927; Hunt 1995) and Irish evidence (O'Curry 1873; see also thesis essay p. 14). Another major contribution is Perkins' view of lichen *depletion* as a force in motivating geographic discovery whereas earlier scholars (Llano 1951) interpreted the discovery of lichen abundance as *the unintentional result* of geographical expansionism. This is a subtle but significant distinction missed by other scholars. Perkins describes how the depletion of *Roccella* in one area (i.e. the Canary Islands) generated the discovery of new supplies in South America, Morocco, Angola and Madagascar. And in Mexico; for this author and Hale & Cole 1988 are virtually alone in their knowledge of the boom and bust orchil industry of Baja California, one that flourished and died in the early 1870s (p.226). The view of lichens as an economic commodity and the affect of the dye trade on ecology makes the interpretation here insightful in regard to the human desire for high status products, a timeless

theme. "Again and again," Perkins writes, "the precious lichens...were in short supply, their known sources decimated and their price rising." That this economic exploitation was not confined to a single time period, as is suggested in those narratives that confine their analysis of lichen dyes to medieval Florence and/or Celtic Europe, underscores the magnitude of this contribution. The only flaw here is that for some reason Perkins gives *Roccella tinctoria* as the "primary" commercial dye lichen (p. 221). Significantly, Stenhouse 1848 is not among her sources (see also Laundon 1986).

Ponting, K.G. (1980). *A Dictionary of Dyes and Dyeing*. London: Mills & Boon Limited. (See also Partridge 1823). This book by one of Europe's leading authorities is considered a classic contribution to the historiography of textiles. Ponting had several careers in his lifetime: early on he was director of the dyehouse and later, overall manager of his family's woolen factory, but I doubt the value of his scholarship in this book which is marred by a lack of attention to detail. His section on lichens is particularly interesting as his source on British 'archil' and Scottish 'cudbear' is not Kok 1966 but Adrosko 1971. (Apparently Ponting's editing of Partridge 1823 was of no help here.) Ponting also notes Edmondston's 1844 paper although he misspells the author's name and gives an incorrect date. These subtle errors are a problem only because this book is used worldwide as a definitive source; the mistakes are passed along, as is the glaring and inexplicable omission of Kok (see Robinson 1969) as a reference for orchil and cudbear.

Pritchard, Frances A. (1984). "Late Saxon textiles from the city of London." *Medieval Archaeology*, Vol. 28, p. 46-76. This valuable article provides the very first evidence of AM lichen dyes on textiles excavated at Roman sites in Britain. There is no question now that the products referred to by Pritchard are anything but genuine orchil; that is, dyes based on *Roccella* spp. Until 1983 there was still no confirmation in the archaeological literature that AM dyes excavated from British sites were indigenous products. Taylor and Walton strongly suggest in their 1983 paper that such a possibility exists. New research since that time (Walton 1988) indicates they were on safe ground in that regard. What was once the 'probable' existence of northern AM lichen dyes is now an historical fact. Pritchard provides a benchmark study which serves as a significant interpretive link. We now have the result of

Kok's 1966 suggestion that more archaeological research is needed (Taylor and Walton 1983) and ample additional evidence in this article. The revision of textile history that I propose in my essay (p. 14-15) will reflect the substance of these individual contributions.

Rambo Walker, Sandra. (1981). *Country Cloth to Coverlets: Textile Traditions in 19th Century Central Pennsylvania*. [See 1800-1850].

Richardson, D.H.S. (1988). Medicinal and other economic aspects of lichens. In: M. Galun, ed., *Handbook of Lichenology*, CRC Press, Boca Raton; Vol. 3, Chapter XIIB, p. 93-108. This comprehensive article is suitable for readers who do not have a scientific background. The lichen dye section begins with a succinct history of commercial dyes such as cudbear, and the use of BWM dyes in the tweed industry. The author's comment that "a few crofters still produce Harris tweed that incorporates a proportion of yarn dyed with...*Parmelia omphalodes*" (p. 102) is a first-hand observation made circa 1971 in conjunction with research for *The Vanishing Lichens* (pers. com. September 3, 1999). Richardson describes BWM dye chemistry, notes the delightful aroma of crottle-dyed wool, and the fact that yarn so dyed is moth-repellant. His AM narrative (p. 103) is focused on cudbear, but he goes beyond to discuss the present use of lichens to make litmus in the Netherlands. Richardson also notes the use of lichens in henna, an application which is increasingly of interest (see Abdulla & Davidson 1996). As with all of Richardson's work, the value of the information is enhanced by footnotes that are abundant and free of errors.

Richardson, Evelyn. (1983). "The Story of the Barrington Woolen Mill " Halifax: Nova Scotia Museum Educational Resource Services Program, Department of Education. Cloth production and sheep farming circa 1770-1920 are covered in this description of a rural Nova Scotia mill which includes two references to lichen dyes. One is a vague and general mention (page 1), but 'cudbear' (page 4) is accurately described as if the author, a well-respected regional writer of note, is referring to a dye used at the mill. Richardson's name is honoured by the Nova Scotia Writers Federation in the form of a prize and her research skills were likely first-class. Yet the cudbear reference would be more persuasive as direct evidence of use at the Barrington mill if the author had cited an account book, or other archival source, as

did Rambo Walker.

Ryder, Michael L. (1983). *Sheep and Man*. London: Duckworth. Whenever a definitive opinion is required relative to the development wool technology relative to the spread of early civilization, this is the source. Barber and Walton are among scholars worldwide who cite this book. In regard to Ryder's cryptic references to lichen dyes, one wonders: why does he bother to include them at all? Throughout this thesis I have made the point that when scholars do not apply to lichen dyes the same attention to detail that characterises the rest of their work, these inconsistencies are apparent. And it is precisely because Ryder is a world-ranked authority, an historian with an interdisciplinary audience that his errors matter (see Barber 1999). In the section on Shetland wool processing, for example, Ryder describes lichens used for dyeing on the Scottish islands. He includes in his discussion the Glasgow dye "cutbear" whose origin he attributes to "Cuthbert Graham" (p. 539). Other spellings of the dye name are acknowledged in this thesis (Rambo Walker 1840). What is noteworthy here is the conspicuous transformation of 'Gordon' into quite another surname.

Samuel, Cheryl. (1987). *The Raven's Tail*. Vancouver: University of British Columbia Press. This historiographical analysis of the Raven's Tail robes is regarded as a useful contribution to West Coast ethnology. It is equally remarkable as a testimony to the author's personal journey from 'Back to the Land' weaver/dyer (Samuel & Higgins 1974) to textile historian. In a book endorsed by no less an authority than Claude Lévi-Strauss, it is surprising that the dye section contains 'wolf moss' (*Letharia vulpina*) data that is only slightly more embellished than the same information in Samuel and Higgins 1974. Raven's Tail Robes involve only three colours; one of these is the yellow dye made from *Letharia vulpina*. Thus Samuel's brief dye analysis, done in so perfunctory a manner, is completely out of context within this study that documents the historiographical treatment of the Chilkat weaving tradition. The recipe provided is as follows: "the lichen is boiled in fresh urine for "about an hour" (p. 24). But there is better documentary evidence for this particular dye than is the case for most native pigments in North America. Moreover, it is contradictory to Samuel's account. These references are to be found, significantly, in British Columbia sources not used by Samuel, notably Brough 1988 and Turner 1979.

Shand, Winifred. (1988?) *The Isles are My Delight*. Edinburgh: Privately printed. (The author is uncertain as to the date.) This account of her life as a controller of the tweed industry allows Shand to convey a real sense of the Outer Hebrides circa 1950 to 1978. The inclusion of information on Scottish Home Industries (e.g. how tweed was selected and graded in the post-war period: compare Hoad 1987) makes this a useful reference; but this qualification does not extend to Shand's cryptic lichen dye mentions that are included, one suspects, because one cannot write such a book without the obligatory reference to crottle (compare Ryder 1983). Shand provides none of the insights or contexts associated with the folklore (Shaw 1986) or the social history (Lawson 1994). This same author did supply an article that includes first-hand accounts of Hebridean dyeing to the first Brooklyn Botanic Gardens dye manual (Schetky 1964), an item which significantly includes not a single reference to crottle.

Shaw, Margaret Fay. (1986). *Folksongs and Folklore of South Uist*. Third Edition. Aberdeen: Aberdeen University Press. [See also Shaw Campbell 1974]. The charm of lichen dye folklore adds value to scholarly work (e.g. Llano 1951, Richardson 1975). Two offerings include lichen dyes (a song on page 176 and vocal/dance music on page 181). These references provide social and cultural details beyond other sources (compare Fenton 1978, Jenkins 1969, Mahon 1983). The reader here assumes an accurate translation from the Gaelic, but dye lichens are misspelled on page 53. Shaw perpetuates lichen dye folklore now in the 'public domain', that no sailor wears crottle-dyed clothing to sea because "what comes from the rocks will return to the rocks" (p. 13). That this is a fiction is proven by the fact the myth is just as often written to mean the exact opposite. In such cases the 'teller of the tale' imparts to crottle-dyed stockings and jumpers the power to *protect* the fisher from harm [see Goodrich-Freer 1902]. This is precisely the point made in my annotation of Bærentsen 1987.

Simmons, Jenni. (1985). *A Shetland Dye Book*. Lerwick: Shetland Times. [See Duncan 1961]. There is a temptation to compare Simmons on Shetland to a woman like Bolton in Wales, someone who focused her energy on a specific aspect of dyeing to write a modest but definitive book. It would appear that Simmons wanted to achieve what Bolton did; that is, a blend of botany, folklore and general dye information. But veracity is where Simmons fails. For none of the three lichens Simmons records as sources of "traditional Shetland colours"

(*Ochrolechia tartarea*, *Parmelia omphalodes*, *P. saxatilis*) is verifiable in Duncan 1961, nor in regard to my 1992 Shetland field work. Two of Simmons' species (*Parmelia omphalodes*, *P. saxatilis*) are on Fair Isle according to Duncan 1961. The third lichen in question, *Ochrolechia tartarea*, is missing from Duncan 1961 as a Fair Isle and/or Shetland species, a fact supported by my own field work. Using Duncan's two lists as a guide, I did find *O. parella* on Fair Isle and mainland Shetland. Simmons does include this species. She also includes the ubiquitous Shetland lichen *Ramalina scopulorum*. But her description of *Xanthoria parietina* as "Parmelia" misidentifies a species that is impossible to mistake given its bright orange colour. A lifelong Fair Isle resident described to me in 1992 the prodigality of *Xanthoria parietina* on coastal rocks where she claimed the lichen was like "orange butterflies in the August gales" (Ann Sinclair, August 1992). Doubtful, I subsequently witnessed this phenomenon which is described in Casselman 1996c. Simmons' suggestion that this very same lichen is "very difficult to collect" is thus inaccurate in regard to my personal observation. Perhaps what Simmons has contributed is something of which she is unaware. Her interpretation of how *Taraxacum officinale* can be made to yield purple involves dandelion root combined with *Ochrolechia tartarea* as the source of the elusive purple [see Fraser 1983]. This answer would be a significant contribution to solving the mystery if *O. tartarea* occurred on Shetland. There is value in cultural studies of this type, but in this case rigorous editing would improve the text. That flaw has not limited its availability for Simmons and Fraser 1983 are both extremely popular with North American dyers.

Sutton, Ann & Richard Carr. (1980). *Tartans, Their Art and History*. New York: Arco Publishing. [See Hoad 1987]. Although considerable in number, the lichen dye references in this book comprise an odd blend of accuracy (Bolton is correctly cited as the source for a blue dye from *Xanthoria parietina*) and misinterpretation ("reds" and "red purple" are erroneously described as results from *Parmelia omphalodes* and *P. saxatilis*). As significant in regard to misinterpretation is a photograph on page 43 that is integral to my hypothesis that domestic lichen dyeing is marginalized when it is ethnic 're-enactment' disembodied from praxis, gender, and issues of labour. "Gathering Crotal, 1939, Isle of Harris" is a prime example of the literature problem. The photograph shows a woman who appears to be Marion Campbell, sitting atop a large boulder, scraping lichen; two younger women scrape lichens off the side;

and all are watched by a female child who wears a 'Sunday frock'. The image is benign on a superficial level but these 'crottle harvesters' were 'positioned' to provide cultural verification. The women in dresses, and the child in her frock, is a dichotomous portrayal, for 'Sunday best' clothing reinforces a 'recreation' and 'leisure' model of lichen gathering in a region where such activity on the Sabbath would be unacceptable even today. (Recently we were prevented from paying a Stornoway B & B bill on a Sunday, and had to return to do this chore on Monday). The 'best dress' scenario also underscores the recreational aspect of crottle gathering which in my opinion is a misappropriation of the domestic labour of women (Lindsay 1868b). For an additional discussion on the gender specificity of another well-known 'crottle gathering' photograph, see MacLean & Carrell 1985 and *The Gorsebrook Papers*.

Taylor, George W. (1985). "Identification of Dyes on Early William Morris Embroideries from Castle Howard." *Textile History*, Vol. 16 (1), p. 97-102. The author claims that a blue dye on one of the Morris tapestries contains ether-soluble material, a category that includes AM lichen dyes (p. 101). Taylor notes that these pigments are, like AM lichen dyes, pH sensitive (*Ibid.*). These characteristics are the basis of his conclusion that "Lichen purple may have been used to modify the [blue] hue of the dyeing" (*Ibid.*). This analysis is indicative of the growing awareness of lichen dyes used not necessarily as the primary pigment, but as a means to adjust and/or modify other dyes. (Hewitt 1973).

Taylor, George W. (1986). "Natural dyes in textile applications." *Relevant Progress in Coloration*, Vol. 16, p. 53- 61. Among this prolific chemist's many papers including those co-authored with Walton Rogers is this contribution in which Taylor records evidence of northern AM lichen dyes he interprets as vernacular equivalents to orchil. Using dyed samples provided by Grierson (1983-86) Taylor establishes a pyridine/water solution as the preferred solvent system for extracting lichen dyes from archaeological textiles; these produce visible spectra which he then compares to Grierson's samples. Notable among his findings is Taylor's opinion that within a few years of the Roman invasion, English dyers had accepted the new technology from the south, a view supported by evidence of AM lichen dyed fragments excavated at Vindolanda (Pritchard 1984, Taylor 1990). The result of the important analytical laboratory work done by Textile Research Associates, where Taylor is a partner, will result in

the rewriting of textile historiography. When an authority of Taylor's stature uses the misspelled 'Rocella' (instead of *Rocella*: see also Taylor 1990), it is very likely that we can blame this misspelling on Geijer 1979 or Robinson 1969 who are still widely used in textile scholarship. The need for a lexicon of lichen dye names linked to specific botanical ingredients must be addressed if textual accuracy is to be a more conspicuous component of technical analysis of this outstanding quality.

Taylor, George & Penelope Walton. (1983). "Lichen Purples." In: H. Dalrymple, ed., *Proceedings of the Second Dyes in History and Archaeology Meeting*, Edinburgh. National Museum of Antiquities of Scotland, p. 14-19. No documentation published since Kok 1966 has done more to advance the historiography of lichen dyes than this paper that contains ground-breaking implications for textile history, implications that go far beyond lichen dyes. For by identifying lichen purples (their unique appellation for AM dyes) at Viking York and the Roman border fort of Vindolanda, Taylor and Walton build on Kok's 1966 suggestion that AM dyes did not 'die out' in Europe after the fall of Rome. They also address issues such as trade and commerce, indigenous industry and manufacture, and mention rank and status vis à vis the symbolism and cultural value of purple. The authors tackle head on the oft-quoted reference to lichens as 'sea weeds' which is in their opinion a non-negotiable identification that leaves no doubt Pliny was referring to *Rocella* (see Plinius Secundus AD 77). It is upon this understanding of Mediterranean orchil as a distinct southern product that the authors base their on-going investigation of northern AM dyes which they interpret, correctly, as vernacular equivalents. Taylor and Walton claim that an indigenous AM dye industry was widely developed throughout northern Europe, based on lichen species such as *Lasallia papulosa*, *Ochrolechia tartarea* and *Umbilicaria torrefacta* [see Walton 1988]. Included in this seminal paper are graphs that show the spectral variations achieved from various lichen-dyed samples by Grierson. Also described are their own laboratory methods using the pyridine/water method subsequently outlined by Taylor 1985. That so few of the current books on textile history delve into dye history is a mystery, particularly when there is in Britain this abundance of published data. Such cogent studies as the work done by this team could contribute greatly to the textile narrative worldwide. When studies of this quality are overlooked by textile historians (Barber 1991) then lichen dyeing will remain marginalized. If the subject is to

advance we must identify and recognize the merit of papers such as this one, and call for an historiographical revision that acknowledges these advances.

Teramura, Yuko. (1984). *Natural Dyes*. Book 1. Tokyo: Atsushi Onuma. (In Japanese). [See Teramura 1992]. Little is known about Japanese lichen dyes. This book represents a substantial breakthrough. Teramura uses recognizable species such as *Lobaria spathulata* (similar to *L. pulmonaria*) and *Umbilicaria esculenta* (the equivalent species to *U. mammulata*). Among the lesser known AM lichens included is *Parmotrema tinctorum* (p. 172), one of the few corticolous lichens used for AM dyes. (Relevant here is my annotation of Earle 1898.) Teramura's *Parmotrema* reds (based on 50% solutions, or a 1:2 lichen to fibre ratio) provide evidence to support his view that there are under-utilized species whose sheer abundance makes them a suitable choice for dyeing. Teramura is one of few authors to photographically-document the historical amalgamation of indigo and orchil-type lichens (p.200; see also Hewitt 1973, Taylor 1985). These photographs illustrate the value of *Ochrolechia*, *Roccella* and umbilicate lichens when used in combination with other dyes, a practice celebrated historically as the epitome of textile aesthetics (Gardner 1896). Even the lack of an English summary does not impede the value of this book which compared to Book 2 (see Teramura 1992) is superior in botanical accuracy and editing.

Upton, June. (1980). "Auntie's Magic Lichen." Unpublished notes. [See Upton 1990]. This single sheet of information on POD dyes was written by an expert practitioner. Her methods were subsequently refined and published in the third Brooklyn Botanic Gardens dye manual, where severe editing reduced their impact and value. According to my many conversations with Upton in Cornwall and in Nova Scotia (1981- 1989), these notes represent the POD process as she refined information gleaned from other sources. While I would like to suggest that Bolton 1960 was an influence in that regard, this is apparently not the case. Nor did Upton particularly like the name 'POD' which I suggested to her as a possibility when it was clear there was a need to describe dyes that were neither AM or BWM in type. These notes convey the author's vigorous intellectual curiosity about one particular lichen and its dyeing properties; her achievement with what is a very challenging technique suggests that she was entirely successful with *Xanthoria parietina*.

Walton, Penelope. (1988). "Dyes and wools in Iron Age textiles from Norway and Denmark." *Journal of Danish Archaeology*, Vol. 7, p. 144-158. Walton's approach in this article is to narrow the possibilities in regard to the identification of northern European dyes by addressing problems related to the laboratory analysis of specific 'unidentified' samples. For example, in Table 6 (p. 154) the author eliminates in her search for "yellow X" twenty-eight plants that are known to produce a range of colours related to yellow, including five common BWM lichens. This attempt to identify or disqualify European BWM dyes on archaeological textiles from the Iron Age is extremely significant according to my analysis of Martin 1695 and Rosenberg 1752. Given that there is little documentary evidence BWM dyes were used in the medieval period, these tests are of considerable significance. Also of note here is the inclusion of a graph showing the spectra of *Umbilicaria torrefacta* which is one of the author's possibilities for a German red dye from the same period as the yellow.

Walton, Penelope. (1989). *Textiles, cordage and raw fibre from 16-22 Coppergate. The Archaeology of York*. No 15/5, p. 283-454. This publication is actually a study in a book-length format complete with illustrations, charts and colour plates. It adds to a body of work that in my opinion is arguably the basis for a rewriting of textile history. The ramifications of Walton and Taylor's combined research and their independent studies support the existence of northern AM lichen dyes as indigenous products that pre-date medieval orchil. This study in particular puts an end to the so-called 'orchil discovery story' long attributed to the medieval Florentine family from which the lichen *Roccella* derives its name (Woodward 1949). This industry, writes Walton, "had led some authors to assume that dyeing with lichen purple was completely abandoned in post-Roman Europe" [and here Walton cites Brunello as an example]. "But the evidence of the York textiles," she continues, "cannot support this conclusion." This single sentence, written more than a decade ago, has changed the historiography of lichen dyes: it has also affected the narrative in regard to the origin and extent of ancient Phoenician dye trade; pre-Roman and Roman production of orchil; local and regional dye trade in northern Europe; the impact of Roman technology among the Celts; Iron and Bronze age trade in northern Europe; and indigenous English industry in the pre-medieval period. Beyond lichen pigments, this particular study as one contribution among a prodigious body of work, establishes the relevance of an interdisciplinary analysis. There are sufficient

references in this 'archaeological' work to provide other scholars with the framework for additional layers of interpretation. Surely postmodern analysis will in the future provide insights into aspects of gender and labour applicable to the role of women as dye makers, dye traders and entrepreneurs. Walton is correct in her assessment of the survival of AM lichen dye technology in post-Roman Europe. This now provides an unparalleled opportunity to do what Perkins did; apply interdisciplinary tools to scrutinize and add value to what is acknowledged in this thesis as a flawed historiography where the unprecedented body of work by Textile Research Associates has not been fully acknowledged or appreciated. Now more than ever Walton's recent work also points to the need for a lexicon of vernacular dye names as the means to more precisely identify dyes, lichen ingredients and names.

Wickens, Hetty. (1983). *Natural Dyes for Spinners and Weavers*. London: Batsford. This unassuming manual is little known due possibly to a dated editorial style and photographs of limited value. The brief lichen dye section on pages 30-33 is, however, accurate and sufficiently detailed to serve as a useful guide. This is a more helpful and comprehensive text than Fraser 1983 and the empirical knowledge in the lichen dye section surpasses Goodwin 1980. Wickens includes methodological details that convey experience; for example, she offers several BWM techniques not described in other British books with the exception of Grierson 1986. Moreover, Wickens realizes that lichens such as *Evernia prunastri* can be used as either AM or BWM dyes (Gordon 1980), a nuance found only in original research of quality.

Wold, Sara & Esther Nielsen, eds. (1984). *Dorte Margete Rosenberg's Farvebog (Dame Margaret Rosenberg's Colour Book)*. Facsimile edition, Blåvandshuk Museum, Jutland, 1984. See Rosenberg, 1752.

1990-1999

Abdulla, Kamil A. & Neil McD. Davidson. (1996). "A woman who collapsed after painting her soles." *The Lancet*, Vol. 348 (September 7), p. 658. This item documents the collapse of a 40-year-old old Saudi woman who applied henna to the soles of her feet when she became "suddenly breathless" and collapsed. Dyers need to be aware of the health risks of adulterated

henna preparations that may contain paraphenylenediamine (discussed in Hale & Cole 1988). Whether based on the Asian shrub *Lawsonia inermis* which is the case with 'authentic' henna, or adulterated with lichens, modern henna contains substances *not identified on the package label*. In the Saudi case, the unknown additive was paraphenylenediamine. 'P' is a reagent referred to in most lichen field guides (Hale & Cole 1988) but potentially carcinogenic effects were not always noted earlier (Hale 1979). Moreover, the public is unaware that paraphenylenediamine is the basis of many ammonia-free hair dyes, a use first disclosed to me by the former head of a Clairol chemistry lab (pers. com. Betty Oberstar, Wilton, Ct. 1994-5.) Compare the lichen-based henna described by Lal & Upreti 1995, one where saliva and *Buellia* are the sole ingredients for a men's dye. Henna is also relevant to my analysis of Barber 1999.

Armstrong, Wayne, & Jamie L. Platt. (1993). "The marriage between algae and fungi." *Fremontia* (Journal of the California Native Plant Society) 22 (2), April, p. 3-11. Scientists are adamant that craft dyers learn about lichen ecology and growth before using lichens to make dyes. Should we except the same? The authors claim on page 7 that a rare species of *Roccella* was once collected in Baja California to make a "blue dye". What the authors likely mean is orchil, which is a red and/or purple dye. The claim that lichens are "still used to dye tweeds from the Outer Hebrides" (p. 8) is also a glib and invalid assumption which perpetuates the myth of crotle dyeing as cultural validation (essay, p. 11).

Bærentsen, Gunnvør. (1994). "English translation of *Dyeing with Lichens* by the author" [see Bærentsen 1987] accompanied by 5-7 pages of notes (unpaginated) on the etymology and origins of Færoese, Norse and Celtic lichen dyes. Along with a self-translation of her book Bærentsen included a series of analytical and critical notes, now in my personal archives. She challenges the reliability of Svabo 1782 who claims that korki was unknown to the Færoese before the 16th century. Drawing on the etymological work of scholar Christian Matras, Bærentsen is unequivocal in support of his opinion that the word 'korki', adapted from the Gaelic 'corcur', appears in the Færoese language before A.D. 1300. Moreover, Bærentsen suggests that Færoese korki derives from the Irish tradition which according to Walton 1988 is a distinct possibility (see also Walton 1993). I also agree with Bærentsen's view of BWM lichen dyes (her 'steinamosa') as possibly a more recent development, one which I note is

under-documented in European literature before the 17th century (Martin 1695). I disagree with Barentsen's conclusion that BWM technology was introduced to the Færoes by Scottish soldiers circa 1612, an opinion based on "the brightness of their tartans". I feel strongly that this requires additional scrutiny, and that a continental European link is more likely as BWM dyes are a long-standing Danish tradition (Rosenberg 1752, Fischer 1720). The familial and political ties between Færoe and Denmark indicate that as a logical cultural progression.

Barber, Elizabeth J.W. (1991). *Prehistoric Textiles: The Development of Cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean*. [See Prehistory Section].

Barber, Elizabeth Wayland. (1994). *Women's Work*. [Ibid.]

Barber, Elizabeth Wayland. (1999). *The Mummies of Ürümchi*. [Ibid].

Bennett, Margaret. (1998). *Oatmeal and the Catechism: Scottish Gaelic Settlers in Quebec*. Edinburgh, Montreal & Kingston: John Donald Publishers & McGill-Queens. This book contains information on how Maryann Morrison, a woman born on the Hebridean island of Harris and later a resident of Quebec, helped her mother gather crotle to make dyes. Bennett provides copious notes here and in her dye section (p. 201-203). More significant than the speaker's actual words is this statement by the author: "Maryann Morrison, who had gathered lichen with her mother from the rocks in Harris, was pleased to be able to do the same in Quebec." (p. 202). This one sentence has significant ramifications in regard to issues raised in this thesis. It confirms lichen gathering a gender specific activity, which I argue is often misappropriated in cultural terms as in *As an Fhearann* (MacLean & Carroll 1985; compare Sutton & Carr 1980). Bennett's statement based on her informant's childhood recollection amplifies to a considerable extent the brief but useful references to immigrant dyes in Pocius 1979 (see also Doucette 1980). That one cannot compare Bennett as a folklorist to Fenton 1978 or Shaw 1986 is a matter of a methodological approach which reflects changes within the discipline itself. By providing a botanical context for the dye she identifies as 'crotal', copious notes, not to mention a bibliography containing hundreds of items, Bennett has transformed a useful reference into solid evidence.

Bolton, Eileen M. (1991). *Lichens for Vegetable Dyeing*. Revised second edition; Karen Leigh Casselman & Julia Bolton Holloway, eds.; McMinnville, OR: Robin and Russ Handweavers. [See Bolton 1960]. This edition includes an editors' preface that describes how Eileen Bolton's niece and I found each other and reissued this classic study. We kept changes to a minimum. In addition to current synonyms, we also expanded Bolton's bibliography. But the most important decision was to revise Bolton's words (p. 26) which clarify her so-called 'discovery' of POD blue dyes from *Xanthoria parietina*. What we now suspect is that Bolton's experiments confirmed a hint she may have derived from her reading of Lindsay 1854 which identifies a 'pink' result from *X. parietina*, but not a 'blue'. (See Appendix).

Buchanan, Meg, ed. (1995). *St. Kilda, The Continuing Story of the Islands*. Glasgow: Scottish National Heritage and Glasgow Museums. A single reference in this book to lichen dyes (crotal, p. 48) represents the only specific mention to dyeing on St. Kilda other than Martin 1695. The value in regard to accuracy is implicit within the museum context of the book itself. But as I discuss in the case of Lunde 1976, such assumptions simply cannot be made in regard to veracity.

Buchanan, Rita, ed. (1990). *Dyes From Nature*. Special printing of Brooklyn Botanic Gardens *Plants & Gardens* Vol. 42 (2). [See Schetky 1964, Weigle 1973 and Upton 1990]. Two of three contributions solicited for this handbook were printed: "Arctic Lichens Dyes" by Wendy Chambers (p.46-48) and "Blue dyes from *Xanthoria* lichens" (p. 49-50; see Upton 1990). [The third by me did not survive the final editing: see Casselman 1992c, Chambers 1980.] In a 400-word contribution, Chambers mentions a dozen species including many that are familiar to readers of Bliss 1981 and McGrath 1977, namely, *Cetraria delisei*, *Dactylina arcticum*, *Thamnolia subuliformis* and *T. vermicularis*. There is no mention of *Umbilicaria* spp. because Buchanan and I agreed that I would cover those in my contribution. Chambers writes that she depends "on just a few lichens to produce the primary colours of red, yellow and blue" (p. 47). There are no recipes or methods provided to support the statement. Chambers uses *Xanthoria* for blue but there is not a word as to how this ephemeral colour is achieved (see Upton 1980, 1990; Windt 1970?). The ultimate question here is the efficacy of an editorial philosophy that severely limits what the individual contributor can offer.

Cardon, Dominique. (1990). *Guide des teintures naturelles. (Guide to natural dyes from plants, lichens, mushrooms and insects)*. Paris: Delachaux et Niestlé. Botanical illustrations of lichens (Plate 44, p. 244) and biochemical diagrams add substance to a text that provides an historical focus amplified by a reliable bibliography. This book is more comprehensive than most dye manuals available today with the exception of *Craft of the Dyer* and *The Colour Cauldron*. An English translation is definitely warranted.

Carlson, Michelle Deanne. (1997). *The Scottish Spinning and Weaving Tradition in Cape Breton and Eastern Nova Scotia*. Thesis (Celtic Studies), Saint Francis Xavier University, Antigonish, NS. [Accompanied by 7 audio tapes.] This contemporary study is a useful tool by which to measure the extent to which an immigrant cultural tradition lingered in specific regions (Burnham & Burnham 1979, Mackley 1967). Based on the Scottish highland/island model, domestic textile traditions transform into 'fakelore' (Huntingdon 1961); also relevant here is the point I make in regard to Eurocentricity (essay, p. 12). Carlson's thesis is an exceptional example of ethical interview procedures that involve oral history. But errors creep in here. For example, Harris-born Mary Veitch describes 'crotail' for dyeing (Appendix VII), an etymological form not found previously in two decades of research. Because lichen dyeing is generally marginalized as an activity, Carlson needs to verify that this form of the word is unique to the region, to the informant, and/or to her *other* dye informants, the well-known Cape Breton weaver Eveline MacLeod and weaver/dyer Angie Aucoin (see MacLeod 1994). A lichen dye photograph raises the question of accuracy for in Carlson's photograph, Aucoin is positioned next to a tree upon which a lichen can be seen, one described here as 'crotal' (p. 45). This means the 'crotail' in the Appendix is a typographical error. In a study characterised by attention to detail within the context of an ethnically-particular portrayal of material culture, the veracity of the project is compromised by such subtle particulars of lichen dyeing. The lichen which Aucoin points to is neither of the two species identified in Casselman 1993c as crottle, namely *Parmelia omphalodes* and/or *Parmelia saxatilis*, both of which occur on rocks. It would have been of some value had Carlson gone one step further and interpreted precisely what Aucoin means when she uses the term. The 'Scottishness' here is more persuasive in regard to the author's Harris-born informant than is the inclusion of Aucoin who is as conspicuously non-Scottish as I am myself (essay, p. 12).

Casselman, Karen Leigh. (1990a). "Lichens an Important Dye Source". *Heddle*, Vol. 6 (4), July/August, p. 6-9. These 1990 articles comprise the first reference in Canadian and/or USA craft literature to Johan Westring's dye studies which are illustrated by the inclusion here of a plate from the 1805 book. Also addressed are conservation measures related to the ethical debate. Included in the bibliography is my contribution written for the third Brooklyn Botanic Gardens dye manual which did not, in fact, appear (see Casselman 1992c).

Casselman, Karen Leigh. (1990b). "18th Century Dye Manuals." *Ontario Handweavers and Spinners Bulletin*, Vol . 33 (2), Summer, p. 4-5. This article describes research at the National Agricultural Library in Beltsville, Maryland, where I first saw Westring 1805; and I discuss as well Rita Adrosko's remarkable library at the Smithsonian where a number of the 18th and 19th century American books included in this thesis were first encountered. Also mentioned is Hale's library at his Smithsonian office (see Hale 1979) where I searched in vain for Hoffmann 1787 but instead found Willemet et al 1787.

Casselman, Karen Leigh. (1991). "Cemetery Lichen Dyes." *Shuttle, Spindle & Dyepot*, Vol. XXII (3), Summer, p. 32-33. Deletion of the introduction and typographical errors that occurred when the hard copy was converted to a disc by SSD identify this article. Intended as an introduction to field guides to assist in lichen identification, the original agreement was to include colour photographs to show weedy species. Much was lost here in the editing including all but one photograph. It remains a contribution of doubtful value other than a single image which shows how to remove *Xanthoria parietina* from a tombstone.

Casselman, Karen Leigh. (1992a). "Dyes: Conservation, Education, Preservation." *Nova Scotia Museum Occasional*, Vol. 13 (1), p. 13-16. This article includes the aforementioned photograph of *X. parietina* in addition to several others that illustrate a text focused on modern dye methods and history. I also suggest that the study of lichen dyes is an educational pursuit when done within botanical and ethical parameters.

Casselman, Karen Leigh. (1992b). "Historical and Modern Lichen Dyes: Some Ethical Considerations." Paper: International Association of Lichenologists Symposium 2, Båstad,

Sweden, August 1992. [Excerpts from this paper were published as Casselman 1994 a, b & c.] As described in my essay, this paper marks the point when I first claim to scientists that the ethical debate is an imbalanced discussion if dyers are excluded from finding mutually workable solutions. An international audience appeared to agree (pers. com. Rex Filson, August 31, 1992). My approach was to suggest solutions formulated within an historical context, on the basis of the distinction I make here between domestic and commercial dyeing. I claim it is unreasonable to equate the amount of lichen in craft dyes to the volume in industrial lichen dyes. Also included are revised dye formulas that feature a 1:10 or better lichen to fibre ratio. Moreover, I recommend in this paper that lichenologists recognize the exploitation of lichens in the cosmetic and perfume trade which I suggest as a more suitable target for criticism than the individual craft dyer.

Casselman, Karen Leigh. (1992c). "A Lichen Dye Primer." *Spin-Off*, Vol. 16 (3), p. 34-38. This article incorporates the material I wrote for the third Brooklyn Botanic Gardens dye book (see Buchanan 1990). The goal was to provide sufficient detail to provide a complete guide to AM and BWM dyes for the novice and the experienced dyer as well. The article includes methodology; the use of reagents to test for the presence of specific substances; an historical survey of crotle and cudbear; and an overview of the literature. The editor (Deborah Robson: see Casselman 1986) highlights warnings against over-harvesting and includes sufficient colour illustrations (6 in total) to provide a clear indication of what to expect from the AM vat process and the results of pH adjustment as a means to diversify results.

Casselman, Karen Leigh. (1992d). "Searching for Eileen Bolton." *Journal of the Weavers, Spinners & Dyers*, Issue 162, June 1992, p. 21-23. [See below]. This is essentially the same as 1992e, a biographical sketch of Eileen Bolton's life and how I came to become interested in her work. Also included are photographs of the author and the reproduction of a colour plate from her book which comprises the front cover of this issue of the magazine. This gesture went some distance to recover what was in my mind Bolton's due reward. Also identified here is Jack Laundon's role in assisting me in finding Bolton, a story that is included in the preface of Bolton 1991. That his good instincts and my perseverance were not enough is described in this article and in Casselman 1982, for Eileen Bolton died shortly before I arrived.

Casselman, Karen Leigh. (1992e). "Tribute: Eileen Bolton: 1903-1981." *Heddle*, Vol. 8 (3), May 1992, p. 7-10. [See above]. Here I elaborate on aspects of Bolton's contribution which are used to illustrate the links in textile history. That research illuminates beyond expectations is a message I was eager to impart, for in craft today too little attention is paid to research that identifies pioneers and provides a context for the links that generate subsequent work.

Casselman, Karen Leigh. (1993a). *Craft of the Dyer: Colour From Plants and Lichens*. Second, revised edition. New York: Dover Publications, Inc. (See Casselman 1980). Rid of the troublesome geographical confusion of the title, this paperback that contains an entirely rewritten section on lichen dyes. The most significance advancement in my research involved two issues: a focus on conservation and the development of new dye formulas. Orsallia (p. 8) is defined here and first described as a North American AM lichen dye differentiated from European AM dyes on the basis of ingredients. I suggest that a combination of umbilicate lichens (p. 169-170) will lessen the pressure on a single dye species. The lichen section also reflects my growing awareness of dyeing within a biological, ecological and historical context. Crucial to these developments were individuals who assisted my autodidactic education. Llano's firsthand description of Hoffman 1787, his remembrance of the lichen herbarium at Uppsala, and of rural lichen dyers in Sweden; Richardson's grasp of the cultural significance of crotle, and his considerable experience in the human uses of lichens in general, not to mention his empirical knowledge in dyeing; and lichen identification assisted by experts, all provided a framework for the new knowledge in this book. Also included are the results of several study trips including my Fair Isle observation that lichens actually *move* (p. 172).

Casselman, Karen Leigh. (1993b). "Lichen dyes, ethics and the environment". *The Wheel*. Issue 7, 1993. Ashburton, New Zealand. The purpose of this article was to identify the ethical debate in a country where lichen dyeing had been very popular in the previous decade (see Gordon 1980). I invited feedback which suggested the activity had totally ceased. I came to the conclusion that criticism can produce a clandestine result where denial is considered a solution. (See essay p. 6)

Casselman, Karen Leigh. (1993c). "Readers guide to lichen dyes." *Loomsong* (Atlantic

Spinners and Handweavers), Vol. 24 (4), Spring 1993, p. 16-19. Asked to provide an article on lichen dyeing, I chose to create a bibliography as a way to redirect attention away from 'dabbling' in dye pots to reading the literature. I included actual samples of AM dyes on Færoese fleece and yarn as a link to the European references mentioned in the bibliography.

Casselman, Karen Leigh. (1993d). "Scandinavian lichen dyes: Part 1." *Ontario Handweavers and Spinners Bulletin*, Vol. 36 (2) Summer 1993, p. 10-13. In this article I describe the thread in my research that linked me eventually to Gerd Mari Lye (Lye & Lye 1981). This article also describes the occasion on which Swedish dye historian Gösta Sandberg (Sandberg 1997) showed me two copies of Westring from his dye library (described in my annotation of Westring 1805). Included with this article are colour images of Sandberg; one of Gunnvør Bærentsen (1987, 1994) showing how she makes her blue POD dye; and one of Swedish lichenologist Leif Tibell wearing a sweater made of handspun wool knitted entirely from self-dyed yarn using BWM lichens. I also note Tibell's query to me about the practicality of a lichen dye revival as a cottage industry in Sweden.

Casselman, Karen Leigh. (1993e). "Scandinavian Lichen Dyes: Part 2". *Ontario Handweavers and Spinners Bulletin*, Vol. 36 (3), Fall 1993, p. 5-7. Høiland 1983 and Høag 1976 provided clues which led me in 1992 to seek korkje artifacts housed at the Lista Museum near Valse, southwest Norway. A letter from Høiland just before I leave claims the museum is closed; interventions described in this article explain how I eventually find Samuel Watnee, the curator, and from him learn details of the Norway-Scottish trade in lichen dyes (Casselman 1996e, 1999) Significant here is my search for the agricultural tool relevant to the lichen harvest, the 'mosegrev' which Watnee permits me to photograph, actually *in use*. (Tievent 1979). This image becomes the back cover illustration for the *Bulletin*. The article also describes Shetland research and my conversation with Ann Sinclair, identified in this thesis as a source of information on the use of lichen dyes on Fair Isle (Fenton 1978). Colour photographs that accompany the text include Ann's father Stewart Sinclair and his handspun yarn ready for use in Shetland lace knitting; and his grandson, Stephen Sinclair, assisting Nick and Sue Riddiford to unload sheep. Editor Ron Abbot also included here the photograph of Cornwall dyer and lace knitter June Upton (Upton 1990) who accompanied me to the Færoe

Islands; Upton is pictured discussing fleece with Barentsen's cousin, sheep farmer Rogvi Egilstoft. These article provide a cultural context relevant to my annotations of Barentsen 1987 & 1994, Clark 1982, Duncan 1961, Simmons 1985 and others.

Casselmann, Karen Leigh. (1994a). "Historical and modern lichen dyes: some ethical considerations." *Norwegian Textile Newsletter*, Vol. 1 (1), p. 1- 13. This version is close to the original 1992 paper presented in Sweden. Editor Betty Johannesson did not reduce the extensive bibliography, but suggestion two charts. One is in the form of a glossary (p. 1) of AM and BWM dye names and origins linked to specific lichen species; the other chart (p. 11) shows the disparity in lichen to fibre ratios found in the literature. Notable in this regard is my error in the second chart where I mistakenly attribute to Brightman and Laundon 1985 a citation of a 4:1 lichen to fibre ratio. The correct figure is, in fact, 2:1.

Casselmann, Karen Leigh. (1994b). "Lichen dyes: ethical aspects relevant to northeastern taxa." *Maine Naturalist*, Vol. 2 (2), p. 61-70. This is the peer-reviewed version of my 1992 IAL paper which was altered to reflect a more appropriate North American context. Included as the issue cover is the *Lasallia papulosa* plate from Westring 1805 which also shows my own dye samples made from Norwegian lichens of that genus. The text is further illustrated by colour photographs (p. 68) of the same lichen in Maine, and *Umbilicate* species from a similar granitic habitat in Nova Scotia. This was the first article to highlight the journal's mandate to provide a cultural and ecological context for northeastern flora.

Casselmann, Karen Leigh. (1994c) "Lichen dyes: preparation and dyeing." *Maine Naturalist*, Vol. 2 (2), p. 105-110. Amplified with a diagrammatic illustration of gyrophoric and lecanoric acids and the conversion of these substances to orcein (p. 105), this second article also includes an image of the title page of the Plictho 1548. AM and BWM dye methods are outlined with reference to a chart that shows excessive and acceptable lichen to fibre ratios, and a discussion of the relationship between new dye formulas and the ethical debate.

Casselmann, Karen Leigh. (1994d). "Lichens: herb de l'orseille." *The Herbarist, A Publication of the Herb Society of America (Kirtland, Ohio)*. No 60, 1994, p. 43-50. A brief survey of

herbal and medicinal uses of lichens. Notable here is the woodcut of *Lobaria pulmonaria* from the 1545 Fuchs herbal, a copy of which was provided by Gösta Sandberg.

Casselman, Karen Leigh. (1995). "Dye Pioneers: A Tribute (Shand and Gerber)." *Ontario Handweavers and Spinners Bulletin*, Vol. 38 (1), Spring 1995, p. 12-13. Winifred Shand [see Shand 1980] and Fred Gerber [Gerber & Gerber 1969, Gerber 1973, Liles & Gerber 1987] died within a few weeks of one another; this article conveys my sense of loss by recognizing what was remarkable in their respective careers. Gerber contributed more and yet as I note in Shand 1980, her firsthand knowledge of domestic tweed production was also significant to textile history. I also felt a sense of impatience that no American nor British magazine I contacted was prepared to honour the memory of these two individuals. Ron Abbot, for many years the editor of *OSH Bulletin*, recognized the value of such a ritual.

Casselman, Karen Diadick. (1996a). "Eco Dyes: toward more natural dyes." *The Woolcrafter*. New Zealand Spinning Weaving and Woolcrafts Society Inc., Vol. 3 (1), March 1996, p. 14. This second New Zealand article I wrote describes environmental and ecological aspects of natural dyeing and how to avoid contamination by using alternatives to chemical mordants. Although one of the few articles from this period in which lichen dyes are not mentioned, it was the basis for Casselman 1996d. This is the first publication of the term 'Eco Dyes', a term whose derivation is discussed in Casselman 1996c.

Casselman, Karen Diadick. (1996b). "Gösta Sandberg: Sweden's master dyer." *Turkey Red Journal*, Vol. 2 (1), 1996, p. 2-3. Although Sandberg's 'blue' book is widely known (*Indigo Textiles*, A & C Black, London, & Lark Books, Asheville, NC, 1989) and an English translation of his 'red' book (Sandberg 1997) is also available, I met no one who had corresponded with the man or visited his outstanding library. Identified in this brief recollection of my time spent with Sandberg is the quality of this collection which I recognize as possibly the finest in all of Europe. Sandberg's passion for Turkey Red is also mentioned in regard to the war in Yugoslavia, a country where much of his research was done. I have included this article as background material relevant to a dye historian about whom very little is known, in spite of the popularity of his books in North America and Europe.

Casselman, Karen Diadick. (1996c). *Lichen Dyes: A Source Book*. Studio Vista Monograph # 1. Cheverie, NS: Studio Vista Publications, Inc. [The revised version of this monograph is included in this thesis as Casselman 2000d.] This publication is designed to provide at a glance an indication of the ethnic and cultural diversity of lichen dyeing as a domestic practice. It contains my first awareness and record of the disparity in historical documentation for AM and BWM dyes; describes my interpretation of historical evidence that supports the role of orchil in ancient murex; provides a North American context for orsallia; defines 'Eco dyes'; and includes advice on salvage botany and ways to harvest without detaching lichens from substrate. A preface and an epilogue amplify the ethical debate and suggest how dyers can play a role in solutions. [See also Casselman 1997a].

Casselman, Karen Diadick. (1996d). "Natural dyes, naturally." *Journal of the Weavers, Spinners and Dyers*, Issue 177, March 1996, p. 12-13. This article is another version of Casselman 1996a, amplified with five colour photographs that show AM lichen dyes as one example of a mordant-free process.

Casselman, Karen Diadick. (1996e). "Norse lichen dyes." *Handwoven*, Vol. XVII (4), September/October 1996, p. 48-50. The motivation for this article was research at Vesterheim Norwegian-American Museum where we discovered significant similarities between the lichen dyes in Norwegian coverlets and my own AM dye samples (Høiland 1983). The textile curator (see Gilbertson & Colburn 1997) was interested to learn about the provenance of specific textiles in the collection. As *Ochrolechia tartarea* does not occur in the Midwest, the presence of korkje would provide another means to further identify a textile as 'imported' (made in Norway) or 'indigenous' (made in the mid-west). One of several colour photographs that show my AM dye samples compared to dyes in a Norwegian coverlet, survived the editing process. Significantly, these samples are from *Lasallia papulosa* and/or *L. pustulata*, and not *Ochrolechia tartarea*. Also included is a map with the location of Farsund vis à vis Scotland, Shetland, and the Færoes (Casselman 1993d, e).

Casselman, Karen Diadick. (1997a). *Natural Dyes of the Asia Pacific*. Studio Vista Monograph # 2. Cheverie, NS: Studio Vista Publications, Inc. This was a Canada Year Asia

Pacific project which involved arts initiatives. Dye charts include AM and BWM lichens dyes of Australia and New Zealand, Asia Pacific references which have since been expanded in this thesis to include Teramura 1984 & 1992, and Hofmann 1997. A primary focus is the question of the ecological effect of natural dyes in the Asia Pacific which I describe as a negative impact on the environment. In regard to this thesis the CYAP monograph represents my first interdisciplinary analysis of gender and ethnicity in regard to dyeing.

Casselman, Karen Diadick. (1997b). "Verdigris: A New Look at an Old Dye". *Shuttle, Spindle & Dyepot*. [Note: Identified as Issue 109, Vol. XVIII (1), Winter 1996/1997 on the cover, the issue is misidentified *inside* the magazine as Issue 110, Vol. XVIII (2) Spring 1997.] This article identifies natural dye mordants in the form of metal acetates which I discovered in the course of research on this thesis. The information on the use of grapes and copper to produce copper acetate came from Bemiss 1806.

Casselman, Karen Diadick. (1998a). "Eco dyes: solutions for the future." *Textile Fibre Forum* (Australia), No. 51, Winter 1996, p. 28-29. This article includes a description of the triple extraction process which is a three-step method applicable to BWM dyes (see the Appendix of this thesis). Also included are colour illustrations of orsallia-dyed fibres.

Casselman, Karen Diadick. (1998b). "Revival of interest in lichen dyes: crottle and cudbear as 18th century dyestuffs." *Wool Record*, Vol. 157 (# 3648), p 57-59. The article is a survey of cudbear and crottle, but it is distinguished, ironically, by the photograph that accompanies the text. Provided 'sight unseen' directly to the editor of the magazine, courtesy of the School of Scottish Studies, it is the identical crotal-gathering photograph used for an exhibition catalogue, one which I deconstruct in this thesis as an example of gender misappropriation (MacLean & Carroll 1985). In the latter case the cutline indicates that crotal is still used to make dyes. In my own case the text is less incorrect as it reads "Collecting crottle."

Casselman, Karen Diadick. (1999). "Norwegian Korkje: Myth and Reality". *Norwegian Textile Letter*, Vol. 5 (2), p. 1-7. The fundamental methodological problems in Lunde 1976 are the focus of this article. There is the question of whether the lichen initially used in her

experiments was *Ochrolechia tartarea*, for it was harvested by someone else. Notwithstanding that puzzle, Lunde is confused as well by the AM dye process. She appears unaware that oxygen is essential in the production of orcein which is the end result of the AM fermentation process (see Appendix). Her observation that the fermentation vat must "not be metal" is correct (p. 2) but Lunde misses the point; the vat must be non-reactive (i.e. glass). Thus the "old earthenware dish" she uses as a vat is an inappropriate choice because a porous surface will absorb the dye during fermentation (Kadolph 1999) and this will have a negative effect on the results. Nor does a shallow container with a wide opening allow for the recirculation of oxygen which is the reason for most AM vat failures (Casselmann 2000d). Instead of purple, oxygen-deprived AM vats produce brownish shades (Geijer 1979), colours identical to what Lunde eventually achieves. My analysis continues with an examination of each stage of Lunde's korkje process including an aborted fermentation period (Benfield 1986, Bliss 1981, McGuffin 1986) that also produces off-colours and/or pastels instead of the usual purple. What is also significant about Lunde's experiments is not that they failed; but that these very same dye failures are the samples the author sends to the Norwegian Institute of Technology. Laboratory tests conducted *to an industrial standard* subsequently prove, and not surprisingly, that Lunde's korkje faded very quickly "to cream". That scholars worldwide view korkje as an inferior dye based on this article was my motive for a new analysis. To balance my interpretation the translator of this article is also a dye practitioner, and one who shares Lunde's opinion in regard to the fastness of korkje (Almedal 1986).

Cooksey, Christopher J. (1997). "Bibliography: lichen purples". *Dyes in History and Archaeology*, DHA Number 15, p. 103-110. Papers presented at the 15th meeting, Manchester, 1996. As mentioned in the preface to this thesis, the idea to prepare a comprehensive bibliography began with a request from editor Penelope Walton Rogers who during her work recognized the need for such a paper. This is a useful tool with sources drawn from archaeology, biology, chemistry, economics, history and craft. Cooksey's work here illuminates the subject of lichen dyes, but there are omissions, in my opinion. Most of these involve not the combined work of Textile Research Associates (Taylor & Walton 1983) but individual contributions. Walton 1988 and Walton Rogers 1993 are included, for example, but not Walton 1991a, 1991b, nor Taylor & Walton 1991. This bibliography is an example where

key words and the volume of text related to the topic are conditions for inclusion, requirements which I did not use in this thesis.

Dallon, Michèle. (1997). "Orchil of Auvergne". *Dyes in History and Archaeology* DHA Number 15, p. 103-110. Papers presented at the 15th meeting, Manchester, 1996. This article provides a much needed account of the French industry in an orchil-type dye. Dallon identifies by several names, including 'parelle orchil' (p. 98), 'Lyons orchil' (*Ibid.*) and the one given in the title. The lichen in this case is *Ochrolechia tartarea*. This means the dye is botanically identical to cudbear and korkje. But 'parelle' is also the common name for *Ochrolechia parella* which one experienced practitioner considers to yield an inferior dye (Grierson 1986). Dallon's narrative is based on archival documents that reveal a lichen harvest for dyeing in the Auvergne as early as the 14 century. This paper provides an important comparison to other sources in this thesis. It supports vernacular northern dyes that paralleled Florentine orchil, provides a contrast to the medieval Norwegian trade, and it adds to our understanding of lichen dyes as aspects of agriculture and rural economy. Only a lexicon of dye names is required to sort out whether 'orchil of Auvergne' is one specific lichen, or as this article hints, possibly more.

Dean, Glenna. (1994). "Dye notes." Unpublished workshop notes. [See Chambers 1980]. [See Sharnoff & Sharnoff 1997]. Dean exhibits considerable empirical knowledge consistent with a PhD in botany and her current work as an archaeologist. The notes provide comprehensive instructions on AM and BWM methodologies but she avoids POD techniques (Chambers 1980, Upton 1990). Her particular skill with BWM dyes. The author also warns against over-harvesting, advises dyers not to buy or sell lichens, and encourages the use of 'found' specimens. (In this case her wording is rather too familiar; nor is it cited in this regard.) I do take issue here with the repetition of the misinformation that "...genuine Harris tweed is still woven with yarns dyed with lichens..." because this material is what Dean provides as a handout to adult learners. This is a highly selective scholar, an intuitive dyer who as a teacher of dyeing, passes along a second rate bibliography. She appears to be unaware of Brough's entirely relevant 1988 study in Navaho lichen dyes, and other dye articles written during this period. Her mention of Eileen Bolton in the present tense, and the 1960 edition of her book in the bibliography, suggests Dean is unaware of the 1991 American edition where it is made

clear the author is in fact deceased [See Casselman 1982, 1992 d, e]. Also included in Dean's bibliography is one manual (Van Stralen 1993) where the lichen dye section is so problematic (essay, p. 7) one questions its effect on Dean, and/or her students. In spite of considerable academic training, what Dean passes along would be enhanced by a statement of personal philosophy and a more current and useful bibliography, one that demonstrates more familiarity with the literature of the subject she teaches albeit as 'recreation' (see Robertson 1973).

Esslinger, Theodore L. and Robert S. Egan. (1995). "A Sixth checklist of the lichen-forming, lichenicolous, and allied fungi of the continental United States and Canada." *The Bryologist*, Vol. 98 (4), p. 467-549. Included here are the current Latin names for 3,799 species of lichens found in North America. Although scholars who lack botanical training are wary of such scientific treatises, there is no need to be. The style is entirely accessible; and thus they provide an inexpensive tool for use in conjunction with a field guide (Brodo et al 2001, Hale 1979, Hale & Cole 1988). This reference is also valuable to establish the likelihood of specific species in North America upon whose presence or absence subsequent textile studies are based (Casselman 1996e, Gilbertson & Colburn, below). [See also Purvis et al 1992].

Gilbertson, Laurann. (1999). "Onion skins and beyond." *Rug Hooking*, Vol. 9 (1), p. 25-29.[See Shippenberg 1994]. Lichen dyes are briefly mentioned in this article that describes how a textile curator who is also a dyer and a rug hooker uses natural dyes as a means to access studies in cultural traditions, textiles and natural history. An alumnus of the Humboldt Institute dye seminar, Gilbertson describes the need to use lichens sparingly and avoid waste.

Gilbertson, Laurann and Carol Colburn. (1997). *Handweaving in the Norwegian Tradition*. "Preserving the Tradition" Exhibition Catalogue. Decorah, IA: Vesterheim Norwegian-American Museum. Catalogues provide verification of distinctive cultural practices such as lichen dyeing and this one offers an interesting comparison to MacLean & Carroll 1985, although that study details rural life/work while this one is focused on rural textiles. To identify korkje-dyed textiles in comprehensive collections of immigrant textiles is one way to better understand the process of cultural adaption. Pictured on the front cover is a mid-to late 19th century Norwegian *Åklæ* (coverlet) that contains purple wool. I visited

Vesterheim collections at the request of Gilbertson who is the Textile Curator, in 1995. The AM lichen-dyed samples I brought with me (Casselman 1996e) exactly matched dyes in this same coverlet. Of special interest was an AM colour which compared so closely to my sample of *Lasallia papulosa* that Gilbertson and I concluded this species was likely the source of the dye. *Lasallia pustulata* (a related species) is also a common in the Telemark region where the 'Nelson coverlet' originated.

González-Tejero, M., M. Martínez-Lirola, M. Casares-Porcel and J. Molero-Mesa. (1995). "Three lichens used in popular medicine in eastern Andalusia (Spain)." *Economic Botany*, Vol. 49 (1), p. 96-98. A menstrual tea made from *Xanthoria parietina* was prepared and tested by participants at the 1999 Humboldt Institute dye seminar as part of an investigation of non-tinctorial applications of lichens. (See Casselman 2000a).

Harriss, Joseph. (1998). "Timeless tweed: Hebrides history of tweed weaving." *Smithsonian*, September 1, n/v; p. 16-22. This article by a Paris-based writer offers a useful comparison to Carter & Rae 1988, and to Yeadon 1990. Harriss confesses that although he is "a sucker for both the place and the cloth it produces" (p. 16), his affection for the landscape and its textiles (see Casselman 1982) have not compromised his logic. Citing a Harris Tweed Association document, as does Llano 1951, Harris writes that "Another chore island women no longer do is collecting lichen and other plants to make dyes." (p. 19) He continues: "The crotal lichen, the colour of winter heather, *used to be* especially prized." (*Ibid.*). Notable here is Harriss' reference to women as lichen collectors, a contrast to the the *As an Fhearann* photograph which I interpret as gender misappropriation. Also significant in this article is mention of the death of Marion Campbell (p. 19). Will the tendency to imply praxis by placing a basket of crotle near the loom, now end? The answer is unclear. It is ironic that Harriss interviews the wife of Campbell's nephew, one Katie Campbell, only to be shown precisely what *she* keeps near her loom - "a small, bright bag of vegetable-dyed wool" (p. 19). These dyes are identified as not the work of Katie Campbell herself, but come from the hand of the dyer and weaver whose skill is so widely acknowledged, Marion Campbell herself. (Campbell died January 11, 1996. Pers. com. C. Lawson, September 16, 1999).

Herald, Jacqueline. (1993). *World Crafts: A Celebration of Designs and Skills*. London & Asheville, NC: Oxfam and Lark Books. Lichen dyes are not mentioned in this book on Third World crafts which Herald did not 'write' so much as 'edit' as a considerable number of correspondents are acknowledged as providing information and photographs. But next to Gerhard 1964 this is one of very few references to murex that while brief, is nevertheless accurate. We do not know if Herald herself has witnessed the murex process but veracity is conveyed by the description. The troublesome 'milking' reference in the literature is here contained within a cultural and biological context of Mexico's Pacific coast (p. 130). Only large species of molluscs are used because the orifice is of a size that enables the dyer to *blow* across the shell opening in such a way as to cause the snail to ejaculate the hypobranchial fluid. Grierson 1986 uses the term "milking", but does not explain how the process works; nor does Barber in her several books which include this dye. The advantage is that this method leaves the molluscs alive to be used again which as I note in *The Gorsebrook Papers* as a significant detail. Herald's explanation of the hypobranchial fluid as dull yellow, then turning to green, and finally purple, is correct; I know this because I have done it. (Humboldt Institute, Steuben, Me., September 1, 1999; tests on wool were performed by my student Maureen Wilson.)

Hill, David J. (1998). "Lichen Dyes: A Source Book." Review. *The Lichenologist*, Vol. 30, p. 304. [See also Casselman 2000b]. Although there have been numerous articles on historical dyes in the house organ of the British Lichen Society (Benfield 1986, Henderson 1985), this review is included as an example of fair judgement in regard to lichen dyeing. It is significant for having been published in a journal which as I discuss in my essay (p. 8) has included little over the years. Hill discusses the ethical debate and conservative lichen to fibre ratios. Admittedly he is a moderate in regard to this issue. As a lichenologist, a dyer, and dye historian (Rutty 1772), as was his father who worked with Ethel Mairet, Hill does not identify with those who censure dyers but relates as does this monograph to the idea of lichen dyeing as a means of cultural expression and botanical history.

Hofmann, Regina. (1997). "The Bühler collection of Indonesian dye plants." *Dyes in History and Archaeology*, 15th meeting, Manchester 1996. [See also Cooksey 1996]. The inclusion of *Ramalina* as a *post-dye* fabric treatment "...used to give a final dressing to fabric..." (p. 10) is

a highly unusual reference that extends our knowledge. Unlike some ethnobotanical reports there is no attempt here to suggest the writer is speaking of this practice from first-hand experience. Instead the author, a noted dye chemist, interprets archival materials to arrive at what she perceives to be a unique Timorese application. This is a far more valuable reference than is the doubtful 'blue' lichen dye from Peru (Antúnez de Mayolo 1989) for which we lack a context. Hofmann provides it. She suggests that the lichens may have provided a mucilage (p. 19) which was somehow useful as a topical application to plant-dyed cotton batiks. Moreover, her interpretation is entirely valid in light of Llano's information that certain lichens are used to make "light-coloured gelatin, isinglass...or similar products" (1951, p. 417). [Lichens as a pre-dye mordant are described in Casselman 2000d.]

Hunt, Tony. (1995). "Early Anglo-Norman receipts for colours. *Journal of the Warburg and Courtauld Institutes*. Vol. 58, p. 203-209. [Included in section AD 1000- 1499].

Kåfjord Kommune. (1997) *Rátnogoddin/Greneveving*. (Grene Weaving) Manndalen, Norway & Osaka, Japan: Kåfjord Community and the National Museum of Ethnology, Osaka. This study published in both Sami dialect and Norse, and the accompanying video, document how the women of Manndalen, assisted by the Husflidslag (Handcraft Association), initiated a textile cooperative. One of the founding members of the group and still an active participant is Olaug Isaksen, a Sami dyer I interviewed in arctic Norway. Isaksen and Oliva Nilsen dye much of the yarn used to weave the Manndalen rugs whose production is documented here. A photograph of Olaug, weaving, is on the cover; inside, on page 6, she is pictured dyeing.

Kadolph, Sara J. (1999). "Fermentation and Natural Dyeing." Abstracts of the Seventeenth Annual Conference of *Ars Textrina*, St. Paul, MN, p. 13-14. [See Farrar 1974]. This paper is one of few recent scholarly reports that includes an analysis of lichen dyes. The author addresses various approaches in the literature and finds that AM dye vats do qualify as an example of fermentation described here as a "degradation of complex organic compounds by enzymes from microorganisms such as bacteria, yeasts and molds." As discussed in my annotation of Brough 1984 and Casselman 1996c, I revised the term 'AFM' (ammonia fermentation method) to 'AM' because of disparate opinions to the nature of fermentation.

Kadolph is of the opinion that the technical description of the process is entirely appropriate to AM lichen vat dyes. Another opinion is that microbial activity in lichen vats needs to be examined by an organic chemist before we can draw further conclusions as to the nature of organisms in AM vat dyes. (pers. com. D.H.S. Richardson, September 10, 1999).

* **Karmous, Tijani & Naceur Ayed.** (1999). "Lichens of Tunisia: Chromatography & Identification." *Dyes in History and Archaeology*. DHA Numbers 16/17. Papers presented at the Greenwich meeting. The paucity of information on lichen dyes outside of Europe means that this paper must be included as one that extends the geographical basis for AM dyes. It presents an argument in support of the identification of unknown archaeological purples in Tunisia as AM lichen dyes. The authors note that *Waynea stoechadiana* contains lecanoric acid; and this is the lichen they put forward. Conspicuous by its absence in these authors' list of more than fifteen AM dye species, however, is *Rocella*, or any awareness of Gaetulian purple, another African AM dye discussed at length in Perkins 1986.

Keay, John & Julia Keay, eds. (1994). *Collins Encyclopedia of Scotland*. London: Harper Collins, 1994. It is a welcome sight to find in a general reference book brief but accurate descriptions of crottle (p. 201) and cudbear (p. 202). There is no mistaking the fact that here the editors refer to a practice that has passed. Their accounts are embellished with folklore that illustrates the mythology. What is protection afforded by crottle in Shaw 1986 is transformed here into a tale whereby the wearing of something blue mitigates the natural inclination of lichen-dyed garments to return to the rocks. And yet another myth - a lunar one - creeps into the narrative when "...crottle would be collected in a long summer's day (preferably when the moon was waning), then left to soak for about three weeks in a tub of urine." (p. 201)

Kjellmo, Ellen. (1996). *Båtrya: i gammel og ny tid. (Boat Rya: Past and Present.)* Stamsund: Orkana. Included in this book on the woven pile rugs of Norway are colour plates of 'korkelav', correctly identified as *Ochrolechia tartarea* (p. 27) and 'fargelav', a vernacular Norwegian name for BWM lichens such as *Parmelia saxatilis* (28). Kjellmo is an experienced dyer; at her Bødo studio she described to me how one particular rug woven from fargelav had faded. (Interview June 26, 1999). After a rigorous discussion involving four dye practitioners

(one of whom was Almedal: see Casselman 1999), we arrived at a conclusion derived from Kjellmo's precise explanation of which lichens she used, where they were harvested, and even the exact time of year. A cover of deep snow deprived the lichens of oxygen and sunlight; this, we suspect, may have affected the concentration of lichen substances and thus compromised the fastness of her dye. Empirical knowledge in regard to BWM dyes among contemporary practitioners is relevant to this thesis and to Kjellmo's book which is currently being translated into English for publication in the *Norwegian Textile Letter* (see Casselman 1994a, 1999).

Krog, Hildur, Haavard Osthagen and Tor Tønsberg. (1994). *Lavflora: norsk busk - og bladlav*. (Norse Macrolichens). Oslo: Universitetsforlaget. A photograph of *Cladonia rangiferina* formed into solid sheets which are cut into slabs for home insulation (p. 324) is one of several northern applications described in this excellent field guide which includes black and white plates showing hundreds of lichens. Dyes are mentioned briefly in the Appendix on page 324-5 with reference to Lye and Lye 1981.

Labelle, Ronald. (1995). *The Acadians of Chezzetcook*. Lawrencetown Beach, NS: Pottersfield Press. [See Chiasson 1972]. There are times when the oral tradition must be treated with great care. In this book there are two references to lichen dyes that are worthy of note, but neither is in association with textiles, as in Chiasson 1972. Labelle refers instead to lichen dyes used to colour Easter eggs. The author does not comment on this as an example of Acadian traditional ecological knowledge, or suggest it is a tradition particular to the Chezzetcook area. This diminishes the value of what is an unusual mention in the literature. The botanical details involve a pink dye made with *Xanthoria* (p. 51) which can be verified in the literature (Upton 1980, 1990); but the green Easter egg dye made with *Usnea* (*Ibid.*) in my experience, cannot (Casselman 1996c, 2000d).

Lal, Brij and D.K. Upreti. (1995). "Ethnobotanical notes on three Indian lichens." *Lichenologist* 27 (1), p. 77-79. [See also Abdulla & Davidson 1996]. Lal and Upreti provide what may be the most unusual lichen dye reference in this entire thesis. The dye they document is noteworthy on several counts. It involves a species little known as a dye; it is a product specific to skin rather than hair; and *it is used by men*. I asked one specialist for his opinion

on this application and he agreed that it sounds a trifle far-fetched (pers. com. D.H.S. Richardson August 24, 1999). But it is important to include such dye references in light of the increased interest in gender specific applications of organisms where ethnic applications are as particular as this one. The lichen in question is *Buellia subsorioides*, a crustose species that adheres closely to rock. According to the authors "This lichen yields an orange-coloured dye, locally called *maidi*. The herdsmen of the Garhwal region...use the lichen as a substitute for henna to colour their finger tips and palms. They spit saliva on the rock...and start rubbing it with...a small piece of rough stone...". The lichen/saliva paste that accumulates is then "applied in the form of drops on the finger tips and palms to make designs." (p. 78). [Compare the adulterated lichen-based hennas described in Abdulla & Davidson 1996.]

Lalonger, Louise. (1994). "La transition des colorants naturels aux colorants synthétiques et ses répercussions. (The effects of the transition from natural dyes to synthetic colours.) *Material History Review*, No. 40 (Autumn) p. 19-28. Although this article does not mention lichen dyes *per se*, Lalonger includes a reference (p. 25) to a synthetic dye known as 'archil red'. The link between an AM lichen dye name, archil, and chemical dyes, is significant. It supports the potential for the cultural recognition inherent in AM lichen dyes which according to my interpretation is under-valued. It also confirms the eagerness of manufacturers to capitalize on a popular identity in the same way the Harris Tweed Association exploited the bucolic implications of crottle. (See Llano 1951).

Lawson, Bill, ed. *Croft History Series*. (1991- 1994) Northton, Harris: Lawson Publications for Comann Eachdraidh Uibhista Tuath. A complex system of numbering makes it necessary for the reader who seeks crottle references to scan each and every volume of this oral history series. Particularly useful in this regard are Vol. 1, 1991 (North Uist) and Vol. 2, 1994 (general). These brief but firsthand recollections of crottle harvesting and dyeing support neither Bennett's 1998 interpretation of lichen harvesting as a female activity, nor MacLean and Carroll's 1985 portrayal of this work as done by men. Moreover, this Hebridean portrayal of the harvest as a 'picnic' is a problematic one that contrasts sharply with firsthand accounts in Norwegian sources as recorded by Vågen & Engelsjøen (forthcoming) where labour, physical risk and rural poverty are the issues.

Liles, Jim. (1990). *The Art and Craft of Natural Dyeing: Traditional Recipes for Modern Use*. Knoxville, TN: University of Tennessee Press. References to lichen dyes in this book are brief. Liles is accurate on page 156 when he states that murex was 'stretched' by the inclusion of lichens in the purple process. While his interpretation is correct, I am disappointed that the author claims 'archil' is less fast than murex (see Liles & Gerber 1987); and that Liles, a zoologist, at no times uses the botanical name, *Rocella*. These are small points. They become important details, however, when the book in question is generally as outstanding as this one.

MacLeod, Eveline. (1994). *Colours from Field and Forest*. South Haven, NS: Privately printed. Eveline MacLeod is to Cape weaving, spinning and dyeing what Marion Campbell was to the Harris (Carlson 1997). An instructor at the Gaelic College of St. Anne's, MacLeod told me she wrote this manual for children. (Interview, South Haven, December 9, 1997). MacLeod notes the distinction between AM and BWM dyes but her misspelling of the few Latin names included, and an incomplete method for AM dyes, limits the value of this publication in regard to discerning readers of any age.

Milner, Ann. (1992). *The Ashford Book of Dyeing*. Wellington, NZ: Bridget Williams Books. The lichen dye recipes here are differentiated as to method, and the recipes are complete. Curiously, Milner does not include a conservation warning; but on page 39 she advises dyers to purchase lichens only from suppliers who collect outside protected areas such as national parks. In the 'Dyer's Code of Ethics' (p. 34, Casselman 1996c) and in articles written specifically for a New Zealand audience (Casselman 1993b) I advise against the purchase and /or sale of dye lichens.

Moberg, Roland and Ove Holmåsén. (1990). *Lavar. En fälthandbok. (Lichens: A Hand Book)* Stockholm. [See Grierson 1989].

Mørkved, Brynhild and Arne C. Nilssen, eds. (1993). *Plant Life*. Tromsø: University of Tromsø and Tromsø Museum. This book includes an unusual and valuable colour photograph of a woman wearing a contemporary garment knitted from BWM-dyed wool. (p. 65). Another example of a lichen-dyed sweater is the striped one dyed, spun and knitted by Lief Tibell (illustrated in Casselman 1993d). Contemporaneous garments so dyed are extremely uncommon; they are noteworthy, as here, because most lichen dyed yarns are used primarily in weaving (Kåfjord Kommune 1997; Kjellmo 1996).

Muthesius, Anna. (1993). "The Byzantine silk industry: Lopez and beyond." *Journal of Medieval History*, Vol. 19, 1/2, March/June, p. 1-67. The author reconstructs a 1945 article by R. S. Lopez (*Speculum, Journal of Medieval Studies*, Vol. 20 (1)) within a feminist perspective and applies to her own revisitation of the Theodosian and Justinian codes an analysis that includes gender references to silk weavers, dyers and traders. Muthesius identifies non-murex "purples of some type" (p. 47) and speculates that these may be the dye she calls 'archil'. As a classics scholar Muthesius brings into sharp focus over-looked issues of gender relevant to the murex industry, namely, that ancient murex dyers - the famed purpurarii - were not, as some would claim, exclusively male. The question Anna Muthesius put to me when we met by chance at the Textile Conservation Centre at Hampton Court Palace, was this: "Could those unknown purples lichen dyes?" (pers. com., London, June 21, 1998). My answer was yes (see my annotation of Barber 1999).

Narui, Takao, Chicita Culberson, William Culberson, Anita Johnson and Shoji Shibata. (1996). "A Contribution to the chemistry of the lichen family Umbilicariaceae." *The Bryologist*, Vol. 99 (2), p. 199-211. Advances in biochemical analysis including thin layer chromatography have resulted in the identification of substances peculiar to umbilicate lichens. These products are recognized as meta and para depsides (see Culberson reference in Asahina & Shibata 1971), new types of orcinol depsidones (p. 199). Also noted in this study are "...some polysaccharides of the Umbilicariaceae [that] offer potential anti-cancer and anti-HIV applications." (p. 199). The authors describe most umbilicate species as having "high concentrations of the trepside gyrophoric acid, always accompanied by smaller amounts of its probable depside precursor, lecanoric acid" (p. 199). Also identified in umbilicate lichens are additional satellite compounds which may account for, in the case of dyeing, variations that improve fastness or perhaps extend the colour range. Also noted here is the fact that the chemical constituents of certain umbilicates vary geographically; moreover, morphological similarities are often overridden by this chemical difference. Thus lichens that look alike (i.e. *U. americana*, *U. mammulata* and *U. vellea*: see Poelt & Nash 1993) may in fact contain traces of these additional twenty-three compounds discovered by the research team. These compounds may affect dye results, and thus this paper is significant because it helps to explain colour disparities that I have observed. For example, my experience with certain umbilicate species is conspicuously different from the work of Brough (pers. comm. 1993). Moreover, Richardson's results from *Actinogrya muëhlenbergii* (which in Narui et al = *Umbilicaria muëhlenbergii*) vary from mine: he does

not find this species to be productive for dyeing, whereas I include this lichen in the three-species mixture I call 'orsallia'.

Nelson, Lila. (1998). "Color in traditional Norwegian folk coverlets." *Norwegian Textile Letter*, Vol. 4(4), p. 1-7. [Nelson's analysis here is based on an examination of Einar Lexow's 1914 "Rutevev" study translated by John Gundersen.] A former Curator of Textiles at Vesterheim Norwegian-American Museum, Nelson is unlike Lunde 1976 not herself a dyer although she is an accomplished weaver. Her article is included because it confirms korkje practice in Norway at the turn of the century. This is important evidence in regard to Lunde's claim as to its absence fifty years later.

Poelt, J. & T.H. Nash III. (1993). "Studies in the *Umbilicaria* group in North America." (*The Bryologist*, Vol. 96, p. 422-430. [See also Llano 1950]. This paper describes morphological variation in the Umbilicariaceae to identify physical and biochemical differences that recognize *U. americana* as distinct from *U. mammulata* and *U. vellea*. This description of variation in rhizinae and other particulars as to thalline colour and thickness will aid those to whom correct species identification is the basis for dye experimentation. [See also Narui et al 1996].

Purvis, O. W., B. J. Coppins, D. L. Hawksworth, P.W. James & D.M. Moore, eds. (1992). *The Lichen Flora of Great Britain and Ireland*. London: Natural History Museum & British Lichen Society. This is the essential UK reference for nomenclature and taxonomy. [For North American nomenclature, see Esslinger & Egan 1995; see also Brodo et al 2001].

Richards, Lynne. (1994). "Folk dyeing with natural materials in the Oklahoma Indian Territory." *Material Culture*, Vol. 26 (2), p. 29-46. Richards identifies more than 30 different Native American tribes and documents wide-spread natural dye use in the past and present centuries. "Two informants obtained brown and grey dyes," she writes, "from the mosses ... on oak trees and rocks" (p. 37). "It is assumed these are references to lichen dyes" (*Ibid.*). No attempt is made to identify genus or species, although Richards' includes sources such as Bolton 1960 and Hale 1979, and, curiously, my 1991 "Cemetery" article. There is no mention of my earlier articles; of the 1991 edition of Bolton; or of Casselman 1980, Grierson 1986, or other books which demonstrate that it is possible to attempt to provide a fuller context for even brief citations.

Richardson, D.H.S. (1991). "Lichens and Man." Chapter 9. In: D. Hawksworth, ed., *Frontiers in Mycology*. Lecturers from the Fourth International Mycological Congress, Regensburg 1990. C.A.B International. Unlike Richardson 1988, this paper does not include a section on dyeing. The abstract, however, does make reference to the ethical debate within the context of both tinctorial and non-tinctorial human applications. After he surveys current human uses of lichens in perfumes and for wreaths, the author states that "At the moment these activities do not pose as serious a threat...as did the collection of lichens for dyeing in the past" (p. 187). The brevity of an abstract does not allow for amplification. In my opinion, to insert the word "commercial" or "industrial" before dyeing would have made the important distinction between dye manufacture as distinct from craft praxis.

Roubal, Ted. (1996) "Dyes from nature: Oregon coast lichens provide rich colors for fibre and fabric." *Oregon Coast*, Vol. 15, November/December, p. 48-50. The value here is in the correct identification and spelling of AM and BWM dye species; and the colour photographs of *Placopsis gelida*. Conspicuous by its absence is any warning against over-harvesting. For a cultural link between the author's avocation of fly-tying and Ireland, see Hart 1898.

Rutt, Richard. (1990). *The History of Knitting*. London: Batsford. The lichen dye section of this controversial book by the Bishop of Leicester is troublesome for its inaccuracies. This book perpetuates the idea that lichen dyes were synonymous with Fair Isle knitting, an idea I discount in Casselman 1993d, and in my annotation of Fenton 1978. Rutt claims that the orange lichen *Xanthoria parietina* gives an orange dye. In a book by anyone else, this myth would go unnoticed. Two additional errors create problems. One is the incorrect citation for Edmondston's 1844 paper which Rutt gives as published in 1841 when he was sixteen (instead of in 1844 when he was twenty); and Hibbert, to whom much of this problematic Shetland dye lore is attributed, is omitted from Rutt's bibliography. These are minor errors; but Rutt is a scholar of note, a textile enthusiast whose grasp of historiography is as prodigious as his legendary knitting skills. His rigorous analysis of every minutiae of his subject is proof that such details matter to him.

Sandberg, Gösta. (1994). *Purpur/ Koschenill/ Krapp: En bok om röda textilier. (Murex, Cochineal, Madder: A Book about Red Textile Dyes.)* Stockholm: Tidens. [See below].

Sandberg, Gösta. (1997). *The Red Dyes: Cochineal, Madder and Murex Purple: A World Tour of Textile Techniques*. Asheville, NC: Lark Books. Questions as to the integrity of the translation begin with an examination of the front cover. The title of the original Swedish edition (above) has been rewritten here to better reflect the cultural value of not only red and purple dyes; but this subtle shift in emphasis does not prepare one for the change in subtitle where '*A World Tour of Textile Techniques*' was not in the original Swedish edition. Other translation problems include the section on page 190 where I cannot understand the English version of what is said about my own research. But what I note in a posthumous tribute (Casselmann 1996b), bears repeating: this book is visually stunning in the original edition. While the same colour images appear in this edition, there is a conspicuous decline in quality that affects in particular the orchil colour plate on p. 40. This is disappointing because the colour plate illustrating contemporaneous dye colours available from Canary Island *Rocella* is - to my knowledge - the only one currently in print. A similar flaw is the misspelling of *Rocella canariensis* in both this and the original edition, and orchil as 'ochril'. Sandberg describes orchil used in woad dyeing which is less well known than other orchil combinations such as orchil and indigo, and orchil and madder. Sandberg's story about how murex was discovered (p. 24) differs from my own version (Casselmann 2000b). Also different from my concept of mollusc anatomy is a hypobranchial gland which is described here as located "in the 'cloak' inside the mollusk's rectum." (p. 28) a phrasing that highlights the translation problem. Of more value is Sandberg's inclusion of the verbatim recipe for murex dyeing as given by Pliny the Elder. Having established the significance of murex manufacture, and acknowledged the role of orchil in that regard, Sandberg's interpretation of the illustrious Papyrus Holmiensis (see Caley 1927) is translated in such a way as to present such dyes as "forgeries" rather than 'faux' purples; and there is a difference. An exception to the unevenness of this English text is chemist Jan Sisefsky's contribution on dye chemistry (see Sandberg & Sisefsky 1980). Given Sisefsky's multilingual capacities, this chapter exhibits a consistency lacking in the rest of the text. The strengths are that this book allows the author to demonstrate his love of ancient textiles. Among outstanding examples included here are colour plates of a 2nd century mollusc-dyed linen fragment from Palmyra (p. 24); a purple Coptic fragment (p 83); and my favourite, the famous woodcut of the medieval dyer from Amman (circa 1560). Amman was but one of the treasures in Sandberg's personal library which made a visit there a once-in-a-lifetime experience (see Westring 1805). A detail most will miss here is Sandberg's correct

date for the *Plictho* (see Rosetti 1548; Brunello 1973). This is not an obsession with accuracy but due to the fact that Sandberg had the 1548 original at hand, a claim few can make. The value of this unprecedented personal collection is also indicated here by a colour plate on page 195, which shows twenty or so of his historic manuals and floras. Gösta's daughter, Sofia, is shown on page 166 wearing a Dalarna bonnet, or *kråka*. But what remains as a poignant tribute to Gösta Sandberg is that this splendid visual record that includes Macedonian/Albanian embroidery and spinning, and ethnic costumes of Turkey is proof that dyes are an outstanding tool by which to interpret ethnic diversity as exemplified in the richness of a country's textiles.

Sharnoff, Sylvia Duran & Stephen Sharnoff. (1997). "Lichens: more than meets the eye." *National Geographic*. Vol. 191 (2), February, p. 59-71. [See also Brodo, Sharnoff & Sharnoff 2001]. Conversations with the senior author indicate attempts to wrestle her text into the 500-odd words required by NG left her less than satisfied with the results. I have similar feelings about this badly-needed popular article on the ecology and biology of lichens which includes dyes by Glenna Dean: see Dean 1994. I am pleased that those portions of the text faxed to me in Scotland in 1996 where I was doing research at the time, survived copy-editing. The prime example is the description of Harris Tweed on page 63 where my insistence on the word "earthy" instead of "musky" (and/or even worse, their preference, "musty"), prevailed. (See Richardson 1975). Also maintained was my wording that states in unequivocal terms that lichen dyes were "once used" in the Scottish tweed industry. My favourite image here is not the fibres but the grey house on Martha's Vineyard, covered in orange *Xanthoria*. As this article indicates, lichens are not always substrate specific. In Australia in 1998 I encountered a Volkswagen van whose reputation was based on the fact that its windows were lichen-covered. This dichotomous nature of lichens is in my opinion better captured in Sharnoff & Sharnoff 1992 which is not forced into such a tight style.

Sharnoff, Sylvia Duran & Stephen Sharnoff. (1992). "Life on the margin." *Equinox*. No. 65 (September/October), p. 54-62. [See also Brodo et al 2001; MacMillan 1979]. The photographs of *Ramalina*, *Teloschistes* and *Xanthoria* in this article are among the finest lichen images published. This passion for what lichens *look like* fuelled the energy that drove this team across North America. According to colleagues, there was nothing more important than

lichens in their lives (Brodo, Sharnoff & Sharnoff 2001). This text is sufficiently omprehensive to interest dyers who desire a biological and ecological context as a means to better understand the stunning visual appeal of lichens as depicted in this article.

Shippenberg, Trudi. (1994). "The Colours of Winter". *Rug Hooking*, September/October, p. 40-43. (See Gilbertson 1999). Writers borrow information, but there are acceptable ways of doing this as illustrated by Gilbertson 1999. What sources were used by this well-known Connecticut rug hooker? There are several clues as I note in my annotation of Dean 1994. I feel that this author borrowed from Grierson 1986 the very unusual colour description "greyish-purplish red" which Shippenberg includes as her own on page 43. There is no bibliography, so are we to blame other authors for Shippenberg's mistakes? The AM methodology, according to the chart on page 42, appears to involve *Umbilicaria*, and what is described as "Parmelia perlata" (e.g. =*Parmotrema chinense*); but the vat timing suggested is too brief (as I indicate in regard to disappointing AM results Van Stralen 1993). Also troublesome is the author's technique of adding wool to the actual AM dye vat. Published recipes for the correct method are widely available (Grierson 1986; also available were many of my own articles and Casselman 1993a). Grierson feels that you cannot pick and choose what people will take from your work (pers. com. Tibbermore, June 1985). I agree. The trouble occurs when dyers short-cut what are sound formulas in their haste to obtain colour rather than learn the basics first, and then develop patience.

Taylor, G.W. (1990). "Ancient textile dyes." *Chemistry in Britain*. Vol. 26 (12), p. 1155-1158. [See also Taylor & Walton 1983, Walton & Taylor 1991]. This article by the prodigious textile chemist features an illustration of considerable value to the interpretation of the historiography of northern European lichen pigments. Figure No. 4 (p. 1157) shows a comparison of the visible spectra of three lichen dyes: sample 1 is authentic orchil, made from 'Rocella' (*Rocella*, which Taylor persists in misspelling: see Taylor 1986). The second sample is an AM dye from the Roman site at Vindolanda; and the third, a Grierson sample made using *Ochrolechia tartarea*. As Taylor notes, the Roman dye spectra " does not exactly match those of the more modern lichen purples" but he concludes that there is sufficient evidence to state that the Vindolanda sample is not a berry stain. I find this too trifling a conclusion, one

incongruent with the of data already presented in Taylor & Walton 1983.

Teramura, Yuko. (1992). Natural Dyes. Book 2. Tokyo: Atsushi Onuma. (In Japanese). Again Teramura uses both AM and BWM methods, but different species of the same lichens examined in her first book (*Usnea diffracta* in 1984, and in this book, *U. rubescens*, p. 171). Teramura bases her understanding of lichen dyes, according to her bibliography, on Mairet. How much help was Mairet? The answer may be apparent for the AM dye Teramura includes is not *Ochrolechia tartarea* (i.e. cudbear) but the disputed dye species *O. parella* whose Latin name is misspelled in this book. Ironically the photograph of *Ochrolechia* actually shows two species, one of which looks suspiciously like *O. tartarea*. Teramura's most striking colours - a saturated orange, and a robust copper - are obtained using a very conservative 30% solution; but these derive from an "unknown" lichen (p. 176). Teramura's BWM samples from a *Sphaerophorus* (see Kok 1962, Smith 1934) produce pale colours that suggest 'beige' as one reason not to waste lichens (see Brightman & Laundon 1985). Her results from *Cetraria* produce a slightly stronger yellow using a "100% solution" a 1:1 ratio of lichen to fibre; but his colour can be extracted from plants more common than lichens. These typographical and interpretive problems were absent in Teramura's 1984 book.

Turner, Nancy, and Laurence C. Thompson, M. Terry Thompson and Annie Z. York. (1990). Thompson Ethnobotany: Knowledge and Usage of Plants by the Thompson Indians of British Columbia. Memoir No. 3. Victoria: British Columbia Provincial Museum. [See Brough 1988; Samuel 1987]. While this document relates to Turner's earlier work (*Plants in British Columbia Indian Technology*, 1979), it is a more particular study, one rich in botanical and ethnographic detail. The analysis of lichens dyes (including *Letharia vulpina*) is provided within the context of the oral tradition. The recipes given here are not only more fully developed than in Samuel 1987, they are a different methodology. For example, Samuel's yellow dye made from *Letharia* involves boiling the wool and the lichen in urine, whereas Turner et al (p. 75-76) do not mention urine at all. (Neither does Bearfoot 1975, nor Brough 1984). The richness of detail in this book lends to the lichen dye information a measure of cultural veracity. For example, there are few lichens other than *Letharia* that contain sufficient pigment to be applied *directly to the skin*, an attribute that makes 'wolf moss' valuable as a

facial paint (p. 75; compare Lal & Upreti 1995). Such a lichen is also a better candidate for dyeing quills (which are notoriously difficult to dye) than are most others. [See Isham 1743]. Photographs of clothing and shoes fashioned from various species of *Alectoria* that also provide tangible evidence of the importance of lichens as clues to human technology, past and present. (See Gonzáles et al 1995).

Tyler, Chris. (1998). *Poetry of the Vessel*. Exhibition catalogue. Halifax, NS: Art Gallery of Nova Scotia. The curator of this invitational show provides in his essay a context for 'vessel' that includes all manner of artistic expression including mixed media works using animal skulls, painted and/or dyed with lichens. One of the works in question ("Requiem for Vindolanda") relates to Taylor and Walton 1983. On a 1992 visit to Vindolanda I was struck by the beauty of a cattle skull excavated at the site. When I found a skull on the beach, some years later, I dyed it with orsallia. There is almost no evidence of lichen dye practice in public gallery exhibitions regardless of an 'art' or 'craft' theme. (This paradox is addressed by me in *The Gorsebrook Papers*).

Upton, June. (1990). "Blue Dyes from Xanthoria Lichens". In: Buchanan, ed., *Dyes From Nature*. Brooklyn Botanic Gardens, *Plants & Gardens* Vol. 42 (2), p. 49-50. Crammed into fewer than 300 words is this article by one of handful of dyers who has experimented successfully with the orange lichen *Xanthoria* to produce POD or photo-oxidized blue dyes (See Rutt 1990). While the photograph showing her remarkable abilities in this regard was not used, there is a picture of the British species *Xanthoria ectanoides*. The evolution of Upton's involvement in the BBG project was as odd as the outcome. Buchanan asked me for the name of "someone overseas" who did dyeing, and I recommend Upton. In my reply to a 1989 letter from Upton, whom I had met in Cornwall in 1981, I suggested it would be unwise to credit Eileen Bolton with 'discovering' the *Xanthoria*-based blue dyes because by then I had proof that the dye was known to Westring (1805). But the text reads: "Dyers who have done historical research into old dyes... can find no mention of the this technique earlier than Eileen Bolton's *Lichens for Vegetable Dyeing*" (p. 50). If I am the dyer to whom she refers, then this error is perhaps a shared responsibility. When I informed Upton that the dye was known to Westring, she did not reply. Perhaps the information did not reach her in time. Or did the editor decide that this was a detail of no consequence? (See Rutt 1990, Van Stralen 1993).

Van Stralen, Trudy. (1993). *Indigo, Madder and Marigold: A Portfolio of Colours From Natural Dyes*. Loveland, CO: Interweave Press. The story of how a book filled with glorious colour and offered at a hefty retail price can contain so many errors and omissions, not to mention a bibliography containing only fifteen entries (some of which are of doubtful merit) is relevant to questions raised in Bliss 1981 and Buchanan 1990. How can natural dyeing advance in an atmosphere that perpetuates mediocrity? This book has done more to misinform on the subject of lichen dyes than anything else published in North America in the past twenty years. On balance, this is the most sumptuous dye manual ever produced on this continent. The brief text is written in a neo-pioneer style (Samuel & Higgins 1974) where jokes and apparently little editorial work set a tone that is anomalous to the sophistication of the aesthetics. When the author describes how she came to natural dyeing there is the opportunity for the editor to identify the relevance and value of Van Stralen's considerable achievements. "I discovered that many recipes were the same in different books, and many did not work even though I followed the directions carefully." (p. 18) Why did these recipes not work? One answer she gives is because the recipe in question "called for half a cup of tin." The author's point is that her yarn was ruined; not a word is mentioned about personal safety - here, or elsewhere in the text - although Van Stralen uses mordants such as sulphuric acid (p. 19). Amid stunning photographs of naturally-dyed silk, mohair and wool boucles is a "lichen section" (in reality barely 200 words) of such dubious merit it would have been wiser to exclude it. Where was the editor in this process? "Orchil or archil" which is correctly identified as *Roccella tinctoria*, is according to Van Stralen "found throughout Canada." (p. 110) How a semi-tropical lichen finds its way into "the mountains of Canada" (*Ibid.*) remains a mystery. Van Stralen's most saturated lichen dye colour is a pale pink, not purple; and it is achieved from a 1000% dye bath which represents a lichen to fibre ratio that is unacceptable (see my essay, p. 7, footnote 42). None of the reliable North American sources available at the time is included in her bibliography; see Grierson's comments in my annotation of Shippenberg 1994. The author has misidentified *Umbilicaria* which is virtually impossible to confuse with *Roccella* (the former is flat and leathery, dark brown to olive in colour; the latter is tufted, with pale green-grey branches). But the lichen pictured as *Roccella* (p. 110) is *Umbilicaria mammulata*. No other dye book in print contains a more wasteful AM dye methodology (essay, p. 7). The one BWM dye included is likewise confused for what is shown as *Parmelia* is actually the AM lichen *Lasallia papulosa* (p. 72). Do editor and publisher share responsibility here?

Both the publisher and the editor *are dyers* (Buchanan 1990, Ligon 1988). What an assessment of this book comes down to is the trivialization of craft. In this case the lack of care (essay, p. 7) suggests an audience incapable of intelligence and discernment. What I contend in my essay (p. 15) is that future readers will seek a higher standard.

Walton, Penelope. (1991a). "Dyes and wools in textiles from Mammen (Bjerringjy), Denmark." In: M. Inversen, ed. *Mammen: Grav, Kunst og Samfund i Vikingetid*. Jysk Arkæologisk Selskabs Skrifter, Vol. 28, p. 139-143. AM dyes on three silk textiles are described. Walton concludes that because the silks "probably originate" in the Middle East or Mediterranean, the dyes are most likely *Rocella*. Also noted here is the preponderance of purple at Viking Dublin compared to Viking Norway, as discussed in Walton 1988.

Walton, Penelope. (1991b). "Textiles". Chapter 13 (p. 319-354), in: J. Blair and N. Ramsay, eds. *Medieval Industries*. London: The Hambledon Press. The illustration of the famous 'Beverley dye pot' (actually a 12th century wooden vat, fed by a boxed pipe: p. 335) and the late medieval dye house at Norwich are notable in this chapter which provides a succinct overview of medieval English textile trade and manufacture. Although published some years after Walton's 1989 study (Coppergate), it adds something new by bringing Furley to wider attention. And this is no small thing; for the Winchester cork trade featuring an indigenous AM dye is part of the demystification in Kok 1966. By 1989 Walton had already published her opinion that purples found in Britain prove the existence of a trade in orchil and/or vernacular AM dyes. Additional research will complete the story and perhaps link this documentation to the Nordic AM lichen dye narrative and the purples at Viking Dublin.

Walton, Penelope & George Taylor. (1991). "The characterization of dyes in textiles from archaeological excavations." *Chromatography and Analysis* (June); no vol. #; p. 5-8. This article about laboratory procedures used to detect dyestuffs on archaeological textile fragments is, like all of Textile Research Associates work, far-reaching in its implication. Walton and Taylor claim that absorption spectrometry followed by thin layer chromatography can in most cases detect not only the presence of a dyestuff, but "identify the colorant". TLC also allows his research team to distinguish "among certain closely-related dyes" (for their methods see

Taylor & Walton 1983). These procedures lead them to an important critical distinction in dyestuffs associated with Iron Age Viking burials in Norway where there is a predominance of blue, made from *Isatis tinctoria* (woad) and Ireland, where the predominant colour is purple. The Irish purples are significant on two counts. The authors identify the probability that northern murex and/or orchil equivalents were an indigenous product, used separately, or in combination (an interpretation I support in Casselman 1996c; see also Taylor 1986). There is now concrete evidence to suggest a link between the archaeological evidence of pre-medieval, indigenous Irish purples and O'Curry's 1973 claim that *Umbilicaria* and other northern species were used in Ireland to make AM dyes. Textile Research Associates continue to push back the dates in regard to the provenance of indigenous AM lichen dyes in northern Europe. This is the basis for interdisciplinary textual analysis that illuminates archaeological analysis.

Walton Rogers, Penelope. (1993). "Dyes and wools in Norse textiles from Narsaq, Greenland." *Meddelelser om Grønland: Man and Society*, Vol. 18, p. 56-58. Cited as "the most significant" among the finds from this Greenland site circa 1300 are the lichen purples which Walton describes here as "especially...deep, rich dyeings." She continues: "The Narsaq findings are therefore vital in establishing that the Norse in Greenland did know how to recognize, prepare and dye with purple-bearing lichens. Moreover, the depth of the dye on textiles such as Narsaq No. 4 indicates that the Greenlanders possessed considerable skill in the technique." What I suggest here is that for such a tradition to have existed on Greenland, it must have come with settlers from Scandinavia. That this transfer of Iron Age technology predates existing literatures references to 14th century Norwegian korkje (as Barentsen 1994 claims) is a significant benchmark for examining the origins of vernacular orchil equivalents. [See Taylor & Walton 1983; Walton 1988]. And while Walton does not speculate as to the species of lichen used, she asked me if I agreed with her choice of possibilities which included *Ochrolechia tartarea* and *Umbilicaria*. And I did. But I do not agree with certain of Walton's other possibilities, AM dyes made from *Evernia* and *Parmelia*, derived from Bolton and/or Grierson. These are not appropriate species because in this instance there is no historical basis for linking such dyes to Norse textile history, which is clearly not the case with *Ochrolechia* and/or *Umbilicaria*. A lexicon of dye names linked to botanical identification will help overcome some of these difficulties.

Yeadon, David. (1990). "Amid the crofters and the weavers of tweed: Scotland's Outer Hebrides." *The Washington Post*. Travel Section. August 26, 1990, p. E1. This article of almost 3,000 words contains a good measure of hyperbole to describe the writer's infatuation with "the brown-grey wilderness of dead heather and bare boulders" around which the wind "screams like banshees." He seeks evidence of the several hundred tweed weavers whose Hattersley looms are described as in their homes, which is not the case (these large semi-industrial machines are housed, in fact, in tin sheds behind the croft). But Yeadon finds his way to where the "moors end dramatically in torn cliffs." This is where he finds Marion Campbell. "And mind that bucket" is the clue that Miss Campbell is about to draw yet another interviewer into her crotle web. "Said bucket," writes Yeadon, "was brimming with bits of vegetation the colour of dead skin, and about as attractive." Campbell tells Yeadon "That's crotal. Lichen - from the rocks. For my dyes." Campbell explains that she is "the last person doing it the...old way." Yeadon is overtaken by the magic of the place. Who can blame him? But Miss Campbell's "dancing feet" are silent on the loom treadles now. (She died January 11/96; pers. com. C. Lawson, September 16, 1999). Like others before him, Yeadon is less interested in the labour involved than he is in the aura of the mystique and the persistent mythology.

Forthcoming: 2000-2001

* **Brodo, Irwin M. & Sylvia Duran Sharnoff & Steve Sharnoff.** (2001). *Lichens of North America*. New Haven: Yale University Press. Distribution maps in this long-awaited study will shed light on the occurrence of specific species in areas where European immigrants settled; that knowledge will be useful in interpreting lichen dye traditions in specific ethnic communities such as the Hebrideans in Quebec (Bennett 1998), and the Norwegians in Minnesota (Gilberston & Colburn 1997). It will provide a possible answer as to the present day availability of *Rocella* in Baja California as a means to understanding the short-lived industry described in Hale and Cole 1988, and Perkins 1986. New insights into the Hudson Bay dye described by Isham 1743 will also be possible once we have this comprehensive guide to the range of hundreds of lichen species from Mexico to the arctic. Such a work is long overdue.

* **Casselman, Karen Diadick.** (2000a). *The Gorsebrook Papers*. This monograph will comprise six papers (one of which is Casselman 2000c) written for Atlantic Canada Studies seminars during the 1998-1999 academic year. Issues identified in these papers include lichens as material culture and artifacts; traditional ecological knowledge relative to lichens; gender specific and non-tinctorial uses; the paradox of contemporary praxis as a form of cultural expression; lichen dyeing and cultural tourism; and ethics and ecology as factors in historical and present use of lichens. Appendixes will include *Thais lapillus* experiments done at the Humboldt Institute (1998-1999) as a means to verify the role of murex in orchil technology as well as orchil/murex combinations on wool and silk. Additional Humboldt experiments are documented, including korkje tests (Lunde 1976, Casselman 1999) and experiments in regard to the gender specific attributes of *Xanthoria* tea (González et al 1995).

* **Casselman, Karen Diadick.** (2000b). "A lexicon of northern European lichen pigments named according to botanical ingredients." 18th Meeting of Dyes in History and Archaeology. Brussels, Belgium. This paper will define vernacular dye names of northern Europe by identifying particular etymology relevant to specific lichens. It will also provide a brief cultural survey of the dyes such as cudbear, cork, crottle, korkje, archil and orseille.

* **Casselman, Karen Diadick.** (2000c). "Lichen Dyes: An Atlantic perspective on a traditional rural industry and craft." In: K. B. Beesley & D. Ramsey, eds. Rural Research in the Humanities and Social Sciences. Proceedings of the Sixth Annual Colloquium. Nova Scotia Agricultural College, Truro, NS, January 1999. This paper examines lichen dyes as domestic textile practice in rural Nova Scotia circa 1940-1960, with references to the parallel Appalachian tradition and that in Quebec. A lack of aboriginal lichen dye praxis in the northeast is noted, and contrasted with the proliferation of the Scottish model.

* **Casselman, Karen Diadick.** (2000d). *Lichen Dyes: The New Source Book*. New York: Dover Publications Inc. Revised and expanded second edition of Casselman 1996c. This edition will include colour illustrations; earlier dates for BWM dyes in Europe (Rosenberg 1752); instructions on how to use lichens as mordants (Hofmann 1997); AM and BWM dyes in Japan; an expanded bibliography; and an epilogue that reflects my thoughts in regard to the

cultural veracity of praxis.

* **Vågen, Inger and Torstein Engelskjøn.** (Forthcoming). "Plants and traditions". In: *Bygdebok for gamle Hydra herred* (Community history of the Municipality of Hydra). Interviews with older inhabitants of Hydra and archival documentation form the basis of this chapter that describes the 18th and 19th century korkje trade of an island community in the Flekkefjord region of southwest Norway, near Lista (see Casselman 1993e). A report by a county officer circa 1790 and tax records from 1800 indicate a flourishing trade that according to the authors depleted *Ochrolechia tartarea* which is, they report, uncommon even today. Also noted are the early 20th century use of *Parmelia omphalodes* and *P. saxatilis* as domestic dyes, a practise distinguished from the commercial dye industry described in the official documents they survey.

GLOSSARY

The dye names published in this glossary are included in the lexicon included here as Casselman 2000b. This is a provisional list only to aid thesis readers.

AFM	ammonia fermentation method; devised by Brough 1984
AM	ammonia method (see Appendix; Brough 1984, Kadolph 1999)
arcel	one version of archil
archil	a vernacular British name for AM dyes
assist	an additive, mordant (see Westring 1805, Taylor 1985)
BWM	boiling water method; devised by Brough 1984
corcur	vernacular Scottish name for AM dyes
cork	a northern AM dye based primarily on <i>O. tartarea</i> (see cudbear, korkje)
corticolous	lichens that occur on trees (see saxicolous)
crotal	an alternate spelling of the Gaelic crottle
crottle	preferred spelling of vernacular name for BWM dyes; specifically those made from <i>P. omphalodes</i> & <i>P. saxatilis</i>
cudbear	AM dye patented in 1758 by Cuthbert Gordon, based first on <i>O. tartarea</i> and later umbilicate lichens (Gordon 1786)
depsides, depsidones	naturally-occurring substances in lichens (see Asahina & Shibata 1972, Culberson 1969, Grierson et al 1985b, Richardson 1975)
fermentation	the AM vat process whereby lichen substances are converted in the presence of water, oxygen and ammonia into orcinol, then orcein (see Kadolph 1999)
fleece	natural sheep's wool, before spun into yarn (fleece dyed before spinning is 'dyed in the wool')
fugitive	not fast to light (has poor lightfastness)
hypobranchial gland	organ of some molluscs spp. that contains viscous fluid used as a dye precursor to make murex

jardarsipan	a Færoese and/or Danish BWM dye based on <i>Peltigera</i> spp. (see Jensen 1977, Trøllanesi 1972)
korkalet	a vernacular Scottish name for cork and/or corcur
korkje	Norwegian AM dye based primarily on <i>O. tartarea</i> , but later on umbilicate lichens (see cork, cudbear)
lichen purples	AM and/or orchil-type dyes; devised by Taylor & Walton 1983
maceration	see fermentation
maidi	one of many vernacular names for henna
mordant	a dye additive or assist; occasionally a post-dye treatment (see Hofmann 1997)
morphology	the physical structure of an organism (i.e. lichen, or mollusc)
mosegrev	Norwegian term for a lichen scraper (Høiland 1983, Casselman 1993e)
murex	an ancient purple dye made from molluscs
orcein, orcinol	the chemical product that is the result of AM dye vat fermentation
orchil	dye name applied <u>only</u> to AM dyes based exclusively on <i>Roccella</i> spp.
orchil-type	preferred name for AM dyes based on lichens <u>other than</u> <i>Roccella</i>
orsallia	a North American dye made from several species of umbilicate lichens including <i>L. papulosa</i> (Casselman 1993a, 1996c, 2000d)
orseille	a French AM dye name not distinguishable as to ingredients (see parelle)
parelle	a French AM dye name (Dallon 1997) identified as based primarily on <i>O. parella</i> (and/or <i>O. tartarea</i>)
POD	photo-oxidized dyes based on <i>Xanthoria</i> spp. (Upton 1990)
reagent	a chemical used in lichen identification
saxicolous	lichens that occur on rocks
stenlav	a vernacular Scandinavian name for BWM dyes = to crottle
umbilicate	a category of lichens including <i>Lasallia</i> & <i>Umbilicaria</i> spp. that contain gyrophoric acid; used for AM dyes such as orsallia

APPENDIX 1: AM/BWM/POD LICHEN DYE METHODS

The sources cited in this bibliography reflect various methodologies in regard to AM, BWM dyes and POD lichen dyes which are so-defined in the Glossary. The procedures outlined here reflect my personal experience and procedural preferences; a full description of methodological variations relevant to international sources is contained in Casselman 2000b. Please see also pages 27-29 in the introductory essay of this thesis.

A1 AM Dyes: Hot Method

Crumble dry lichens to the size of a dime (for species: see Bolton 1991; Casselman 1993a, 1994b, c, 2000b; Grierson 1986). Place lichens in a large, clean glass jar that has a tight-fitting lid: this is the fermentation 'vat'. (The jar should be approximately half-full of lichens.) Pour over the dry lichens in the jar a solution of equal amounts of water and non-sudsing, unscented, household ammonia (1:1). [Variation: use 2 parts ammonia to 1 part water. *Do not use industrial strength ammonia* which is thirty times stronger than the household product.] Prepare and use just enough ammonia/water solution to barely cover the lichens (hydration will cause the lichen pieces to swell and increase in size twofold; the jar selected must be large enough to accommodate this, and the subsequent addition of more liquid). Replace the lid, and set the vat aside for 2-3 days. Remove the lid and add sufficient room temperature water to increase the liquid in the vat to the two-thirds level. Replace the lid. Shake the vat contents vigorously, several times a day, for approximately one week. [This generates oxygen {the contents will appear 'bubbly'} which is essential in order to convert orcinol to orcein (Glossary). The lichen/ammonia/water/oxygen mixture will shift from a 'muddy brown' colour to a strong magenta, generally within 7-10 days. This is an indication that the chemical conversion of the lichen substances, into orcein, is underway. Continue the vat aeration (agitation) daily throughout the fermentation period. To make a dye bath, strain some (or all) of the vat contents into a dye pot, add as much water as required (see same sources as for species used), and proceed with the dyeing. {Too little aeration can spoil an AM dye vat, as can too low/high a fermentation temperature. Maintain the vat indoors or out,

at a temperature between 15-30 degrees Celsius (58-86 Fah). If the dye is used before orcein development is complete (see below), colours will be pale: see McGuffin 1986.

Note: these instructions apply to orsallia (Glossary). Cudbear, cork, korkje and/or orchil differ in two primary ways: ① the lichen species used; ② the period of time required for orcein to develop (orchil requires the *least* time of any AM dyes (i.e. 3 weeks; see fermentation timing charts in Casselman 2000b). A fundamental misunderstanding as to species used (Van Stralen 1993) and confusion in regard to the process (*Ibid.*) perpetuates the misperception that AM dyes are difficult to make. This is not the case.

My methodological adaptations involve a much longer fermentation period for North American AM dyes (due to the variation in lichen substances in many umbilicate species); and the apparently novel idea that a mixture of several lichens places less ecological stress on specific 'preferred' dye lichens. I advise dyers to use a *mixture* of found lichens (unattached from substrate) in both AM and BWM dyeing. And moreover, umbilicate lichens can be harvested in such a way as to leave the thallus *attached to substrate*, and only remove portions from the outer edge.

A2 AM Dyes: Cold Method.

Proceed as above. When the fermentation is complete, strain vat contents and add as much water as required (i.e. the amount of water used does *not* dilute the dye potential; dye strength is affected, instead, by the *weight* of the fibre dyed). Place pre-soaked fibre (wet) in the dye solution, in a dye pot. Place the lid on the pot, and set it aside in a warm location inside the house (i.e. a sunny window, or a greenhouse), or outdoors (on a deck or patio.) Leave the fibre in this 'cold' or 'solar' dye solution for several days, or more.

Some dyers place the wet fibre *directly in* the fermentation vat. I devised the method above as a means of avoiding the negative effect this "in the vat" method has on fibre. Vat pH can be as high as pH 12; by diluting the dye solution with water, the pH is lowered to approximately pH 9 or 10.

B1 BWM Dyes: Contact Method

The so-called 'traditional crottle method' of highland and island Scotland involves layering shredded lichens and fibre (e.g. yarn or in some cases, unspun fleece) in an iron 'cauldron', covering the mass with water, and heating it over an open fire. The dye pot is 'boiled', then removed from the fire and cooled; this process is then repeated one or more times, over several days (the dye is 'done' when the dyer peeks in and approves the colour on the fibre.) The mass is turned out of the pot (it resembles a gluey organic 'sandwich'), and the yarn (or fleece) extricated from the lichens. To replicate this process, simply layer lichens and fibre in a dye pot, pour over cold water to cover, and allow the mass to sit for 1 day at room temperature. Heat the pot and contents to a bare simmer (90C, 190F). Maintain temperature for one hour, remove the pot from the heat, and allow it to cool. Repeat the process one or more times, until the desired colour is obtained.

The difficulty of separating fleece and/or yarn from the gelatinous lichens is the major drawback with this widely-touted BWM method. (Experienced dyers who have tried it are frank in their opinion as to the veracity of claims that 'the lichens shake out'). I have long suspected that 'picking out' the lichen bits from the fibre was a winter sorting process done by family members too feeble or youthful for *other* domestic chores. For the weaver or knitter to also perform this chore would be a considerable waste of production time.

B2 BWM Dyes: Triple Extraction

An alternative to the contact method involves pre-cooking the lichens (to extract the dye substances). The fibre to be dyed is then processed in the resulting dye liquor. Begin by shredding the lichens (for species see AM sources). Place the lichens and 1 or more tbsp. household salt in a dye pot, barely cover the mass with water, and let sit for 1-2 days. Heat the contents of the dye pot to a full boil (100C, 212 F). Maintain temperature for one hour. Remove from heat, and cool the pot overnight. The next day, strain off and save the dye liquor. Pour more cold water over the cooked lichens, and repeat the heating/cooling/straining

process a second time; and finally, a third time. The *combined fluid* is now the triple-extraction BWM dye bath. [Obviously you must limit the amount of water used for each extraction in order to avoid having more fluid than the dye pot can accommodate.]

I devised this method as a response to the contact method, for there is considerably less mess involved, and it thus less time wasted. Triple extraction BWM dyeing was developed as a means of encouraging dyers to make the best possible use of 'found' lichens, for dozens of species can be combined and used accordingly. 'Traditional' BWM methodologies focus exclusively on the use of a specific species in dye making (i.e. *Parmelia omphalodes* in Simmons 1985).

C1 POD Dyes

Photo oxidized dyes made from lichens of the genus *Xanthoria* create blue colours that are the least known of any lichen dyes. [Expert practitioners include Bærentsen 1987 and Upton 1990]. Select a small jar (less than 1 l in size) with a tight-fitting lid, and fill $\frac{1}{2}$ full with pieces of *Xanthoria*. [Use any species; see Botanical index]. Barely cover the lichens with household ammonia. Set aside 2-3 days at room temperature. Then add sufficient water to make a mixture with the consistency of thick soup. Replace the lid, and shake vigorously. The mass will turn pink generally within 3 weeks. Strain off the dye solution and dilute with as much water as required. Place pre-soaked fibre in the dye bath. (For amounts, see AM sources cited for species). When the fibre is dyed 'pink', expose it to direct sunlight until the colours shift to greyish-blue. [Save the dye bath that drips off the fibre, and return it to the dye pot.] The most intense blues (colour of unfaded denim) occur when the fibre is repeatedly dyed pink (on successive days), and exposed to sunlight after each dyeing. [In between the 'pink' and 'blue' is a grey or pewter shade that may discourage inexperienced dyers; it may take a number of dips in the dye bath, followed by oxidization after each one, to fully develop the blue colour.

The methodology for POD dyes is highly variable, as is the story of its origins (compare Bolton 1991, Upton 1990 and Westring 1805).

AUTHOR INDEX

See reader's notes (p. 16-17) in regard to surname variation. First names [and/or initials] are in some cases abbreviated (e.g. Soeurs de l'Ecole Ménagère Régionale de Sainte-Martine is listed as Soeurs 1941); or omitted for co-authors (Clow & Clow). See the **Name Index** for individuals referred to, but not included as sources (Mary Black; John G. Reid, John Thomson).

Historical works are included by the name of the original author (Partridge 1823, Turner 1551).

Cross-referenced to many authors are relevant sources indicated in brackets, except in cases such as Kok 1966 where there are too many such references to include them.

Works of particular value or relevance to the preface, essay, and bibliography, are in boldface.

Abdulla & Davidson 1996 (see Barber 1999) **168**

Adam, Frank 1934 **77**

Adrosko, Rita 1971 (see Bemiss 1806, Bronson & Bronson 1816) **107**

Aiken, Marie 1970 **107**

Aisen, Maurice 1916 **65**

Almedal, Reidun 1986 **135** (see Casselman 1999)

Amsden, Charles 1934 **78**

Antúnez de Mayolo, Kay 1976, **108** 1989 **136** (see Hofmann 1997)

Armstrong, W. & J. Platt 1993 (see MacMillan 1979) **169**

Asahina, Y. & S. Shibata 1971 **109**

Bærentsen, Gunnvør 1987 **136**, 1994 **169** (see Clark 1982, Jensen 1977, Trøllanesi 1972)

Bancroft, Edward 1813 **40** (see Rosetti 1548)

Barber, E. J.W. 1991 **18** (see Campbell Thompson 1934, Plinius Secundus 77)

Barber, E. J. W. 1994 **18** (see Sandberg 1997)

Barber, E. J. W. 1999 **19** (see Abdulla & Davidson, Lal & Upreti, Taylor & Walton 1983, Walton & Taylor 1991)

Bearfoot, Will **109** 1975

Benfield, Barbara 1986 **137** (see Henderson 1984/5)

Bennett, Margaret 1998 **170**

Beriau, Oscar 1933 **78** (see Furry & Viemont 1935, Hellot 1789, Soeurs 1941)

Berthollet, C.L. & A.B. 1824 **41** (see Haigh 1813)

Bliss, Anne 1981 **137** (see Gerber & Gerber 1969)

- Boland, J.P.** 1904 66
Bolton, Eileen 1960 99, 1991 171 (see Casselman 1982, Lye & Lye 1981, Merrill & Haight 1975, Ponting 1980)
Born, Wolfgang 1937 79
Boswell, James (see Johnson & Boswell 1775/1786) 36
Bremnes, Gunn 1979 109
Briggs, Rose 1941 85
Brightman, F. & J.R. Laundon 1985 138 (see Casselman 1982)
Brodo, Sharnoff & Sharnoff 2001 202
Bronson & Bronson 1816 42
Brough, Sherman 1984 139, 1988 139 (see Dean 1994, Narui et al 1996, Samuel 1987, Turner et al 1990)
Brunello, Franco 1973 110 (see Bancroft 1813, Rosetti 1548)
Bryan, Nonabah (Young) 1940 85
Buchanan, Meg 1995 171
Buchanan, Rita 1990 171 (see Van Stralen 1993)
Burnham & Burnham 1972 111
- Caley, Earle Radcliffe** 1926 20, 1927 27
Campbell Thompson 1934 22 (see Barber 1991)
Canadian Handicrafts Guild 1916 66 (see Purkiss 1927, Smith 1934, Soeurs 1941)
Cardon, Dominique 1990 172
Carlson, Michelle 1997 172
Carter, Jenny & Janet Rae 1988 140 (see Harriss 1998)
Carus-Wilson, Eleanora 1954 93
Casselman, Karen Diadick 1996a, 1996b, 1996c, 1996d, 1996e, 1997a, 1997b, 1998a, 1998b, 1999 177-181, 2000a, 2000b, 2000c 203-204
Casselman, Karen Leigh 1978- 1979 111-112, 1980-1982, 141-142, 1986 140
Chambers Encyclopedia 1778 30
Chambers, Wendy 1980 142 (see Buchanan 1990, Isham 1743, Upton 1990)
Chiasson, Fr. Anselme 1972 112 (see Earle 1898)
Chiasson, Fr. Anselme & A. Deveau 1985 143
Christensen, Hilda 1908 67
Clark, Helen 1982 143 (see Nelson 1998)
Clow & Clow 1954 94
Collister, Joan 1944 86
Cooper, Thomas 1815 43 (see Brunello 1973)
Crookes, William 1874 50 (see Rawson et al 1901)
Culberson, Chicita 1969 99 (see Asahina & Shibata 1971)
Culberson, Culberson & Johnson 1977 112

- Dallon, Michèle** 1997 182 (see Rutty 1772)
Dalrymple, Helen 1985 25
Davidson, Mary Frances 1950 95
Dean, Glenna 1994 182
Doucette, Laurel 1980 144
Dunbar, John 1962 100
Duncan, Molly 1972 112
Duncan, Molly 1973 113 (see Bliss 1981, Lloyd 1973, Filson & Rogers 1979, Martin & Child 1972, Miranda 1973)
Duncan, Ursula K. 1961 100, 1963 100
- Earle, Alice Morse** 1898 51 (see Hills 1857)
Eaton, Allen 1937 80, 1949 86
Edelstein & Borghetty 1969 28 (see Berthollet 1824, Brunello 1973, Schetky 1964)
Edge 1914 67, 1915 67 (see Chaisson 1972)
Edmondston 1844 43 (see Duncan 1963; Ponting 1980)
Ellis, John 1769 31 (see Watson 1757)
Encyclopedia Britannica 1878 52 (see Adam 1934)
- Farrar, W.** 1974 113
Fenton, Alexander 1976 113, 1978 113
Filson, Rex & Roderick Rogers 1979 114 (see Casselman 1992b, Martin & Child 1972, Starkey 1977)
Fischer, Birthe 1720 31
Forbes, Robert 1964 23
Forrester, Stanley 1975 114
Fraser, Jean 1983 144 (see Hoad 1987)
Furley, John 1927 24 (see Carus-Wilson 1954, Hunt 1995)
Furry & Viemont 1935 81
- Ganong, William** 1889 52
Gardner, Walter 1896 53 (see Rawson, Gardner & Laycock 1918)
Geijer, Agnes 1979 115 (see Caley 1927, Casselman 1999)
Gerber & Gerber 1969 115, 1973 115, 1977 116 (see Bliss 1981, Ligon 1988, Liles & Gerber 1987)
Gilbertson, Laurann 1999 183
Gilbertson, Laurann & Carol Colburn 1997 184
Gonzáles et al 1995 184
Goodrich-Freer, Ada 1902 67
Goodwin 1980 144 (see Hurry 1930)

- Gordon, Cuthbert** 1786 32 (see Clow & Clow 1952, Grant 1961, Kok 1966, Lindsay 1868a, Smith 1921)
- Gordon, Flo** 1980 145
- Grae, Ida** 1974 116
- Grant, I.F.** 1961 101 (see Fenton 1978, Goodrich-Freer 1902)
- Great Exhibition Catalogue* 1851 54
- Green, Judy** 1975 116
- Grierson, Duff & Sinclair** 1985a 148, 1985b 148
- Grierson, Su** 1983 146, 1986 147, 1989 148
- Grieve, 'Mrs'.** 1931 81
- Gucciardo, Linda** 1981 149
- Haigh, James** 1813 44
- Hakluyt, Richard** 1600 26 (see Turner 1551)
- Hale, Mason E. Jr.** 1979 116, 1983 149 (see Earle 1898; Perkins 1986)
- Hale, Mason E. Jr. & Mariette Cole** 1988 150 (see Earle 1898)
- Harriss, Joseph** 1998 184 (see Yeadon 1990)
- Hart, Henry** 1898 54
- Hartley, Dorothy** 1939 82, 1979 117 (see Goodrich-Freer 1902)
- Hartley, Dorothy & Margaret Elliot** 1926-1931 25
- Hellén** 1918 68 (see Stenhouse 1843)
- Hellot et al** 1789 33 (see Berthollet 1804)
- Henderson, Albert** 1984 150 (see Benfield 1986, Gordon 1786)
- Herald, Jacqueline** 1993 185
- Hewitt, Miriam** 1973 118 (see Weigle 1973)
- Hill, David** 1998 185 (see Rutty 1772)
- Hills, Sister Mary Ann** 1857 55 (see Ellis 1769, Krochmal & Krochmal, Rambo Walker 1840)
- Hoad, Judith** 1987 151 (see Ganong 1889, O'Curry 1873, Ross 1896)
- Hodge, Frederick** 1907 69
- Hofenk de Graaff, Judith** 1969 102 (see Høiland 1983, Perkins 1986)
- Hoffman, G. F.** 1787 34 (see Lawrie 1949, Willemet et al 1787)
- Hofmann, Regina** 1997 186
- Høag, Ove** 1976 118
- Høiland, Klaus** 1983 152 (see Casselman 1999, Lunde 1976)
- Horwood, Arthur** 1928 69
- Huebner, J.** 1934 82
- Hunt, Tony** 1995 24 (see Carus-Wilson 1954, Furley 1927)
- Huntingdon, Eleanor** 1961 102
- Hurry, Jamieson** 1930 83 (see Carus-Wilson 1954, Origo 1957)

Isham, James 1749 34 (see Leechman 1945, Rosenberg 1752)

Jaggard, William 1705 35

Jenkins, J. Geraint 1969 103

Jensen, Nicola 1977 118

Johnson, Samuel & James Boswell 1775/1786 36

Jorlin, Engelbertus 1759 36

Kadolph, Sara 1999 186 (see Brough 1984, Casselman 1999, Farrar 1974)

Kåfjord Kommune 1997 186 (see Mørkved & Nilssen 1993)

Karmous, Tijani & Naceur Ayed 1999 187

Karr, A. 1942 87, 1943 87

Keay & Keay 1994 187

Kierstead, Sallie 1950 95 (see Barber 1991, Jaggard 1705)

Kilbride, Thomas 1979 119 (see Mairet 1916)

Kjellmo, Ellen 1996 187

Klemola, Marketta 1978 119

Kok, Annette 1962 100 (in Dunbar 1962), 1966 103

Kontturi, Hulda 1947 87 (see Stenhouse 1843)

Krochmal & Krochmal 1974 119

Labelle, Ronald 1995 188 (see Chiasson 1972, Earle 1898)

Lal, B. & D. Upreti 1995 188 (see Barber 1999, Saklani & Upreti)

Lalonger, Louise 1994 189

Lathrop-Smit, Hermine 1978 120 (see Sauvé)

Laundon, J. 1986 152 (see Brightman & Laundon 1985)

Lawrie, Leslie 1949 87 (see Jorlin 1759)

Lawson, Bill 1994 189 (see Harriss 1998)

Leechman, Douglas 1945 88

Leggett, William 1944 89, 1949 89

Lesch, Alma 1970 120

Ligon, Linda 1988 153 (see Oakland 1973, Van Stralen 1993)

Liles, Jim 1990 190

Liles, Jim & Fred Gerber 1987 153 (see Caley 1927)

Lindsay, W. 1851 55 (see *Great Exhibition* 1851)

Lindsay, W. 1856 58 (see Lawrie 1949, Westring 1805)

Lindsay, W. 1854/55 56, 1868a 59, 1868b 60

Linnaeus 1759/60 37 (see Jorlin 1759)

Llano, George 1944 89, 1950 96, 1951 96 (see Berthollet 1823, Hofmann 1997)

- Lloyd, Joyce** 1971 120 (see Duncan 1973, Filson & Rogers 1979)
Lock, Carolyn 1981 154 (see McGuffin 1986)
Logan, James 1833 45 (see Clow & Clow 1952, MacLagan 1898)
Lönning, Sonniva 1968 104
Lunde, Dagmar 1976 121 (see Almedal 1986, Casselman 1999, Lye & Lye 1981)
- MacKay, Mrs. Anstruther** 1900 70 (see Adam 1934)
MacKay, J. G. 1924 69
MacKay, John 1976 122
Mackley 1967 104 (see Huntingdon 1961, Carlson 1997)
MacLagan 1898 61 (see Adam 1934, Dunbar 1962, Fraser 1983)
MacLean, Malcolm & Christopher Carroll 1985 154 (see Harriss 1998, Sutton & Carr 1980)
MacLeod, Eveline 1990s 190 (see Carlson 1997)
MacMillan, Bill 1979 122
Mahon, Brid 1983 155 (see Goodrich-Freer 1902, O'Curry 1873)
Mairet, Ethel 1916 71 (see Purkiss 1927, Thurston 1930, Turner 1551, Hill 1998, Kilbride 1979)
Manners, John 1978 122
Martin, William & John Child 1972 123
Martin, Martin 1695 27 (see Buchanan 1995, Johnson & Boswell 1743; Rosenberg 1752)
Mason, Otis 1904 73
McClintock, Henry 1950 97
McGrath, Judy 1977 123 (see Sauvé 1977)
McGuffin, Nancy 1986 155 (see Lock 1981, Ruttly 1772)
Mell, C. 1935 83 (see Karr 1942/43)
Merrill, Ruth & Barbara Haight 1975 124 (see Samuel & Higgins 1973, Van Stralen 1993)
Miranda, Catherine 1973 125
Mitchell, Lillias 1978 125
Molony, Cornelius 1837 45
Mørkved, Brunhild & Arne Nilsson 1983 190
Moxham, Tim 1982 157, 1986 156
Mustard, Frances 1977 126
Muthesius, Anna 1993 191 (see Barber 1994, Caley 1927)
- Napier, James** 1875 62
Narui, Takao et al 1996 191 (see Asahina & Shibata 1971, Culberson 1969)
Nelson, Lila 1998 192 (see Lunde 1976)
Nielsen, Esther 1977 (see Wold & Nielsen 1984)

Oakland, Amy 1973 126 (see Ligon 1988)

O'Curry, Eugene 1873 63

Origo, Iris 1957 97

Parnell, Edward 1860 64

Partridge, William 1823 45 (see Ponting 1973)

Perkins, Patricia 1986 157 (see Hale & Cole 1988, Kok 1966, Leggett 1949.)

Plinius Secundus 77 23 (see Turner 1962)

Pocious, Gerald 1979 127

Poelt, J. & T. Nash III 1993 192

Pomet, Pierre 1694 27

Ponting, K.G. 1973 45 (see Partridge 1823)

Ponting, K.G. 1980 159

Pritchard, Frances 1984 159 (see Taylor & Walton 1983)

Purkiss, Eileen 1927 73

Rambo Walker, Sandra 1840 46 (see Hills 1857)

Rawson, Gardner & Laycock 1918 74 (see Gardner 1896)

Rees Encyclopedia 1819 46

Richards, Lynne 1994 192

Richardson, DHS 1975 127, 1988 160, 1991 193 (see Casselman 1993a, Kadolph 1999, Lal & Upreti 1995, Turner 1979)

Richardson, Evelyn 1983 160 (see Lowmiller 1840)

Roberston, Seonaid 1973 128 (see Casselman 1982)

Robinson, Stuart 1969 105 (see Ponting 1980, Seshadri 1966, Taylor 1986)

Robiquet, M. 1830 46

Rosenberg 1752 37 (see Isham 1743, Martin 1695)

Rosetti 1548 28 (see Brunello 1973, Hellot et al 1787, Richardson 1975)

Ross, Alexander 1896 64 (see Adam 1934; Hoad 1987)

Rutt, Richard 1990 193 (see Duncan 1961, 1963; Fenton 1976, 1978)

Rutty, John 1772 37 (see Bancroft 1813, Hill 1998, Hurry 1930)

Ryan, H. & W. O'Riordan 1917 74 (see Hart 1898)

Ryder, Michael 1983 161 (see Barber 1991)

Samuel, Cheryl 1987 161

Samuel, Cheryl (Brooks) & Carol Higgins 1974 128

Sandberg, Gøsta 1997 194 (see Barber 1994, Born 1937, Ganong 1889)

Sauvé, Paulette-Marie 1977 129 (see McGrath 1977)

Schetky, E. 1964 105 (see Buchanan 1990, Weigle 1973)
 Seshadri, T. 1966 106 (see Robinson 1969)
 Sharnoff & Sharnoff 1992 195, 1997 195 (see Brodo et al 2001)
 Shand, Winifred 1988 162
 Shaw, Margaret Fay 1986 162 (see Fenton 1978, Bennett 1998)
 Shaw Campbell, Margaret 1947 90
 Shippenberg, Trudi 1994 196 (see Gilberston 1999)
 Simmons, Jenni 1985 162 (see Duncan 1961, 1963; Hoad 1987)
 Smith, Annie Lorrain 1921 75 (see Crookes 1874, Jorlin 1759, Lawrie 1949)
 Smith, Joe 1934 84 (see Beriau 1934, Canadian Handicrafts Guild 1916, Soeurs 1941, Stronach 1940, Teramura 1992)
 Smith, Titus 1835 46
 Soeurs 1941 90 (see Beriau 1933, Canadian Handicrafts Guild 1916)
 Solberg, Y. 1956 98
 Spires, Gillian 1975 130 (see Casselman 1982)
 Starkey 1977 130 (see Brightman & Laundon 1985, Filson & Rogers 1979)
 Stenhouse 1848 47 (see Lindsay 1851, 1856)
 Stronach 1940 91, 1942 92 (see Collister 1944, Smith 1934; Sutton & Carr 1980)
 Sutton, A. & R. Carr 1980 163 (see Harriss 1998, MacLean & Carroll 1985)
 Svabo, J. 1782 38

Taylor, G.W. 1985 164, 1986 164, 1990 196 (see Robinson 1969)
 Taylor, G.W. & P. Walton 1983 165 (see Kok 1966, Pritchard 1984)
 Teramura, Yuko 1984 166, 1992 197
 Thurstan 1930 84 (see Davenport 1955, Fenton 1978, Fraser 1983, Jaggard 1705)
 Tievant, Pascale 1979 131 (see Cooksey 1997, Høiland 1983, Moxham 1982)
 Trøllanesi, Katrina 1972 131 (see Bærentsen 1987, Clark 1982, Jensen 1977)
 Turner, Nancy 1979 132 (see Lock 1981, Samuel 1987)
 Turner, Nancy et al 1990 197 (see Antúnez de Mayolo 1976, 1989)
 Turner, William 1551 30 (see Furley 1927, Grieve 1931, Hunt 1995, Hurry 1930)

Upton, June 1990 198 (see Bærentsen 1987, Buchanan 1990, Casselman 1993e, Chambers 1980)
 Ure, Andrew 1858 65 (see Berthollet 1823, Haigh 1813)

Vågen & Engelskjøn (forthcoming) 204
 Van Stralen, Trudy 1993 199
 Viner & Viner 1946 92 (see Fenton 1978)

- Wallis & Wallis 1955 98** (see Isham 1743)
Walton, Penelope 1988 167, 1989 167, 1991a 200, 1991b 200
Walton, P. & G.W. Taylor 1991 200 (see Taylor & Walton 1983)
Walton Rogers, Penelope 1993 201
Watson, William 1757 38
Weaver, Richard 1975 132
Weigle, Palmy 1973 133, 1974 133 (see McGuffin 1986, Schetky 1964)
Westring, J. 1791/1792 39, 1805 48
Whipple Pope, F. 1964 106
Wickens, Hetty 1987 168
Willemet, Amoreaux & Hoffmann 1787 39 (see Hoffmann 1787; Kok 1966; Smith 1921)
Windt, Hal 1970 133 (see Van Stralen 1993)
Wold & Nielsen 1984 37 (see Rosenberg 1752)
Woodward, Carol 1949 92 (see also Leggett 1949)
- Yacopino, Phyllis 1973 134**

BOTANICAL INDEX

This list includes those species of lichens, molluscs and plants mentioned in the annotation of sources in this thesis, as distinguishable from those species each source includes.

Nomenclature is based here on Esslinger and Egan 1995 (North America), Purvis et al 1992 (UK and northern Europe); Krog, Østhaugen and Tønsberg 1994 (Scandinavia). Note unusual spellings such as *Lasallia pensylvanica* (only one 'e') and *Roccella* (double 'c', double 'l').

Older names (i.e. *Lecanora tartarea*) in some sources are cross-referenced to current ones (= *Ochrolechia tartarea*).

Spp. = plural; more than one species of the genus in question; see the Glossary for common and/or vernacular names (e.g. crottle; orchil).

Actinogyra muehlenbergii

Casselman 1980

Narui et al 1996

Alectoria spp.

Beriau 1933

Merrill & Haight 1975

Turner 1979

Turner et al 1990

Windt 1970

Alectoria fremontii

Turner 1979

Alectoria sarmentosa

Hellén 1918

Klemola 1978

Baeomyces spp.

Smith 1835

Buccinum undatum (a mollusc; see also *Murex*)

Ganong 1889

- Buellia* spp.
Abdulla & Davidson 1996
- Buellia subsorioides*
Lal & Upreti 1995
- Candellaria* spp.
Westring 1805
- Cetraria* spp.
Beriau 1933
- Cetraria dilisei*
Chambers (in Buchanan 1990)
- Cetraria ericetorum*
Teramura 1992
- Cetraria islandica*
Christensen 1908
Fischer 1725
Hellén 1918
Kontturi 1947
Lindsay 1856
- Cetraria tilesii*
Isham 1743
- Cladonia* spp.
Gerber & Gerber 1973
MacKay 1924
Smith 1934
- Cladonia cristatella*
Lock 1981
McGuffin 1986
- Cladonia pyxidata*
Campbell Thompson 1934
Kok 1966
McGuffin 1986
Rutty 1772

Watson 1757

Weigle 1973

Cladonia rangiferina

Edmondston 1944

Fraser 1982

Hellén 1918

Klemola 1978

Krog et al 1994

Lye & Lye 1981

Dactylina spp.

Isham 1743

Dactylina arcticum

Chambers (in Buchanan 1990)

Diploschistes spp.

Casselman 2000b

Rutty 1772

Stenhouse 1848

Evernia spp.

Merrill & Haight 1975

Shippenberg 1994

Walton Rogers 1993

Yacopino 1973

Evernia furfuracea (= *Pseudevernia*)

Bolton 1960

Hellén 1918

Evernia prunastri

Bolton 1960

Lye & Lye 1981

Stenhouse 1848

Westring 1805

Wickens 1983

Windt 1970

Evernia vulpina (= see *Letharia*)

Everniastrum spp.

Antúnez de Mayolo 1989

Flavoparmelia caperata

Rutty 1772

Fucus marinus (i.e. algae/seaweed)

Gardner 1896

Gyrophora (= *Umbilicaria*)

Gerber & Gerber 1969

Haematomma spp.

Windt 1970

Haematomma lapponicum

Bliss 1981

Haematomma ventosum

Lye & Lye 1981

Hypogymnia physodes

Hoad 1987

Lye & Lye 1981

McGuffin 1986

Robertson 1974

Westring 1805-9

Isatis tinctoria (woad)

Walton & Taylor 1991

Lasallia spp.

Berthollet 1824

Lasallia papulosa

Almedal 1986

Casselman 1980, 1994b, 1996e

Culberson 1969

Gilbertson & Colburn 1997

Grierson 1984

McGuffin 1986

Nielsen 1977

Taylor & Walton 1983
Van Stralen 1993

Lasallia pensylvanica

Bancroft 1813
Berthollet 1824
Gerber 1977
Stenhouse 1848

Lasallia pustulata

Bærentsen 1987
Casselman 1994b, 1996e
Hewitt 1973
Gilberston & Colburn 1997
Gordon 1786
Høiland 1983
Nielsen 1977
Richardson 1975
Taylor & Walton 1983
Westring 1805

Lawsonia inermis (henna)

Abdulla & Davidson 1996

Lecanora (see *Ochrolechia*)

Letharia vulpina

Bearfoot 1975
Hale & Cole 1988
Lathrop-Smit 1978
Isham 1743
Lindsay 1856
Mason 1904
Merrill & Haight 1975
Samuel 1987
Samuel & Higgins 1974
Schetky 1964
Turner 1979
Turner et al 1990
Windt 1970
Yacopino 1973

Lobaria spp.

Smith 1934

Windt 1970

Lobaria pulmonaria

Adam 1934

Casselman 1994d

Hoffmann 1787

Hartley 1979

Lindsay 1856

Lye & Lye 1981

Merrill & Haight 1975

McGuffin 1986

Rutty 1772

Smith 1934

Starkey 1977

Turner 1551

Watson 1757

Westring 1805

Willemet et al 1787

Lobaria spathulata

Teramura 1984

Murex brandaris, *trunculus*, etc. (molluscs; see also *Buccinum*, *Thais*)

Born 1937

Kok 1966

Leggett 1949

Sandberg 1997

Ochrolechia spp.

Chambers 1778

Hoffmann 1787

Mahon 1982

Merrill & Haight 1975

Molony 1837

Rutty 1772

Walton Rogers 1993

Windt 1970

Ochrolechia parella

Culberson 1969
 Dallon 1997
 Duncan 1961, 1963
 Hellot 1789
 Jaggard 1705
 Lathrop-Smit 1978
 Leggett 1949
 Pomet 1694
 Rutty 1772
 Simmons 1985
 Teramura 1992

Ochrolechia tartarea

Almedal 1986
 Campbell Thompson 1934
 Casselman 1996e, 1998
 Culberson 1969
 Clark 1982
 Duncan 1961, 1963
 Edmondston 1844
 Fenton 1978
 Fischer 1720
 Furley 1927
 Gordon 1786
 Høiland 1983
 Hunt 1995
 Jorlin 1759
 Karr 1943
 Lindsay 1851
 Lindsay 1868b
 Lønning 1970
 Lunde 1976
 MacMillan 1979
 O'Curry 1873
 Plinius Secundus 77
 Pomet 1694
 Richardson 1975
 Schetky 1964
 Simmons 1985
 Smith 1921

Taylor 1990
 Taylor & Walton 1983
 Teramura 1992
 Thurston 1930
 Turner 1551

Palmaria spp. (= algae/ seaweed)
 Caley 1927

Parmelia spp.
 Antúñez de Mayolo 1989
 Carlson 1997
 Hartley 1979
 Hellén 1918
 Hoffmann 1787
 Lye & Lye 1981
 MacMillan 1979
 Merrill & Haight 1975
 Shippenberg 1994
 Van Stralen 1993
 Walton Rogers 1993
 Windt 1970

Parmelia caperata
 Ruttý 1772

Parmelia clavulifera
 Teramura 1984

Parmelia fuliginosa
 Hoad 1987
 Tievant 1979

Parmelia molliuscula
 Amsden 1934
 Bryan 1940
 Grae 1974
 Gucciardo 1981

Parmelia omphalodes
 Adam 1934
 Bolton
 Carlson 1997
 Casselman

Duncan
 Fenton 1978
 Hart 1898
 Kilbride 1979
 Laundon 1986
 Maclagan 1898
 Mahon 1982
 McGrath 1977
 O'Curry 1873
 Perkins 1986
 Richardson 1975, 1988
 Robertson 1973
 Ross 1896
 Rutty 1772
 Simmons 1985
 Smith 1921
 Sutton & Carr 1980
 Viner & Viner 1946
 Westring 1805-9

Parmelia saxatilis

Beriau 1933
 Carlson 1997
 Christensen 1908
 Duncan
 Edmondston 1844
 Fenton
 Hellot 1789
 Jorlin 1759
 Kontturi 1947
 Laundon 1986
 Lönning
 Maclagan 1898
 Mahon 1982
 O'Curry 1873
 Ross 1896
 Ryan & O.Riordan 1917
 Simmons 1985
 Sutton & Carr 1980

Parmotrema chinense

Shippenberg 1994

Parmotrema tinctorum

Earle 1898
 Purkiss 1927
 Teramura 1984

Peltigera spp.

Furry & Viemont 1935
 Krochmal & Krochmal 1974
 Merrill & Haight 1975
 Windt 1970

Peltigera canina

Edmondston 1844
 Jensen 1977
 Rosenberg 1752

Pertusaria spp.

Lindsay 1868b
 Stenhouse 1848

Pertusaria corallina

Tievant 1979
 Westring 1805-9

Placopsis gelida

Roubal 1996

Polygonum tinctorium (a type of indigo)

Schetky 1964

Pseudevernia furfuracea

Hellén 1918
 Lye & Lye 1981
 Moxham 1982, 1986

Pseudocyphellaria spp.

Gordon 1980
 Yacopino 1973

Pseudocyphellaria coronata

Gordon 1980
 Lloyd 1971

Pseudoparmelia caperata

McGuffin 1986

Quercus nigra (black oak)

Bancroft 1813

Ramalina spp.

Antúñez de Mayolo 1989

Edge 1914, 1915

Hofmann 1997

Kilbride 1979

Merrill & Haight 1975

Windt 1970

Ramalina menziesii

Sharnoff & Sharnoff 1992

Ramalina scopulorum (= *R. siliquosa*)

Adam 1934

Duncan 1961

Karr 1943

Ross 1896

Ryan & O'Riordan 1917

Shaw 1986

Simmons 1985

Viner & Viner 1946

Roccella spp.

Antúñez de Mayolo 1976/77

Caley 1926/7

Chambers 1778

Ellis 1769

Forbes 1964

Furley 1927

Gardner 1896

Hakluyt 1600

Hart 1898

Jaggard 1705

Jorlin 1759

Karmous & Ayed 1999

Karr 1942, 1943

Kok

Leggett 1949

Lindsay 1851, 1868a
Plinius Secundus 77
Pomet 1694
Pritchard 1984
Rees 1819
Rosetti 1548
Rutty 1772
Sandberg 1997
Seshadri 1966
Taylor 1986, 1990
Taylor & Walton 1983
Turner 1551
Van Stralen 1993
Walton 1988, 1989
Walton & Taylor 1991
Whipple Pope 1964
Woodward 1949

Roccella babingtonii

Hale & Cole 1988

Roccella canariensis

Sandberg 1997

Roccella fimbriata

Hale & Cole 1988

Roccella fuciformis

Edge 1914, 1915

Lindsay 1868a

Rawson, Gardner & Laycock 1918

Smith 1921

Stenhouse 1848

Roccella montagnei

Campbell Thompson 1934

Rawson, Gardner & Laycock 1918

Smith 1921

Stenhouse 1848

Roccella phycopsis

Grieve 1931

Roccella tinctoria

Earle 1898
 Edge 1914, 1915
 Gardner 1886
 Laundon 1986
 Lindsay 1868a
 Perkins 1986
 Rawson, Gardner & Laycock 1918
 Smith 1921
 Stenhouse 1848

Sphaerophorus

Kok (in Dunbar) 1962
 Smith 1934
 Teramura 1992

Stereocaulon paschale

McGuffin 1986

Taraxacum officinale (dandelion)

Adam 1934
 Grierson 1986
 MacLagan 1898
 Simmons 1985

Teloschistes spp.

Sharnoff & Sharnoff 1992

Teloschistes flavicans

Antúnez de Mayolo 1976/77, 1989

Thais chocolata (mollusc)

Antúnez de Mayolo 1989

Thamnia spp.

Isham 1743

Thamnia subliiformis

Bliss 1981
 Chambers (in Buchanan 1990)

Thamnia vermicularis

Antúnez de Mayolo
 Bliss 1981
 Chambers (in Buchanan 1990)

Thais nucella

Casselmann 2000a
 Ganong 1889

Umbilicaria spp.

Almedal 1986
 Berthollet 1824
 Boland 1904
 Burnham & Burnham 1972
 Canadian Handicrafts Guild 1916
 Chambers (in Buchanan 1990)
 Gerber & Gerber
 Grae 1974
 Hoffmann 1787
 Lindsay 1851, 1856, 1868b
 MayKay 1924
 Mell 1935
 Merrill & Haight 1975
 Molony 1837
 O'Curry 1873
 Plinius Secundus 77
 Ryan & O'Riordan 1917
 Shippenberg 1994
 Smith 1835
 Soeurs 1941
 Van Stralen 1993
 Walton 1993
 Walton & Taylor 1991
 Weigle 1974
 Westring 1805-9
 Willemet et al 1787
 Windt 1970

Umbilicaria americana

Narui et al 1996
 Poelt & Nash 1993

Umbilicaria deusta

Casselmann 1980

Umbilicaria esculenta

Teramura 1984

Umbilicaria mammulata

Bliss 1981
 Casselman 1980
 Gerber & Gerber 1969
 Hewitt 1973
 McGuffin 1985
 Narui et al 1996
 Poelt & Nash 1993
 Teramura 1984
 Van Stralen 1993

Westring 1805-9

Umbilicaria pustulata (= *Lasallia*)

Umbilicaria torrefacta

Grierson, Duff & Sinclair 1985a

Taylor & Walton 1983

Walton 1988

Umbilicaria vellea

McGuffin 1986

Narui et al 1996

Poelt & Nash 1993

Urceolaria (see *Pertusaria*)

Usnea spp.

Labelle 1995

Lye & Lye 1981

McGrath 1977

Smith 1934

Solberg 1956

Stronach 1940

Merrill & Haight 1975

Windt 1970

Usnea barbata

Antúnez de Mayolo 1976/77, 1989

Hellén 1918

Kontturi 1947

Stenhouse 1848

Usnea diffracta

Teramura 1992

Usnea florida

Furry & Viemont 1935

Usnea hirta

Edge 1915

Usnea rubescens

Teramura 1992

Waynea stoechadiana

Karmous & Ayed 1999

Xanthoparmelia spp.

Amsden 1934

Brough 1988

Bryan & Young 1940

Xanthoparmelia conspersa

McGuffin 1986

Xanthoparmelia taractica

McGuffin 1986

Xanthoria spp.

Bærentsen 1987

Casselman 2000e

Chambers 1980s

Labelle 1995

Lye & Lye 1981

Merrill & Haight 1975

Sharnoff & Sharnoff 1997

Thompson 1934

Windt 1970

Upton 1990

Xanthoria ectanoides

Upton 1990

Xanthoria parietina

Campbell Thompson 1934

Canadian Handicrafts Guild 1916

González et al 1995

Liles & Gerber 1987

Lindsay 1851, 1856

Lye & Lye 1981

Purkiss 1927

Ryan & O'Riordan 1917

Simmons 1985

Sutton & Carr 1980

Westring 1805-9

NAME INDEX

Names of individuals annotated in the text are not included here unless there is a reference to their work beyond the publication cited (i.e. Mary Black, cited in Collister 1944, is also mentioned in

Acadians, in North America

Chiasson 1972
Chiasson & Deveau 1985
Earle 1898
Labelle 1995

Akkadians (Babylonia)

Forbes 1964
Perkins 1986

Almedal, Reidun

Casselman 1999
Lunde 1976

Anglo-French

Furley 1927

Anglo-Norman

Hunt 1995

Aucoin, Angie

Carlson 1997

Bærentsen, Gunnvør

Clark 1982
Trøllanesi 1972

Birkinshaw, Dr. S.

Lindsay 1851

Black, Mary E.

Collister 1944
Eaton 1949
Mackley 1967

Bolton, Eileen
Bolton 1991
Casselman 1982, 1993a, 2000b

Bolton Holloway, Julia
Bolton 1991
Casselman 1993a

Bradford Colour Museum (UK)
Huebner

British Crafts Council
Casselman 1982

British Library
Casselman 2000b
Hunt 1995
Kok 1966

British Lichen Society
Henderson 1984/5
Hill 1998

Brodo, Irwin M.
Martin & Child 1972
McGrath 1977

Brooklyn Botanic Gardens
Buchanan 1990
Schetky 1964
Upton 1990
Van Stralen 1993
Weigle 1973
Yacopino 1973

Brother Arnold (Shaker)
Hills 1857

Buchanan, Rita
Chambers 1980
Upton 1990
Van Stralen 1993

Bühler, Alfred

Born 1937

Hofmann 1997

Campbell, Marion

Carter & Rae 1988

Casselman 2000a

Harriss 1998

MacKay 1976

Manners 1978

Richardson 1975

Sutton & Carr 1980

Yeadon 1990

Canadian Hand(i)craft(s) Guild

CHG 1916

Smith 1934

Castle Howard

Taylor 1985

Chicago Field Museum

Antúnez de Mayolo 1976/77

Chief Jerry Lone Cloud

Smith 1835

Coppins, Brian

Lindsay 1851

Culpepper, Nicholas

Turner 1551

Dyes in History & Archaeology (DHA)

Taylor & Walton 1983

Dioscorides

Leggett 1944

Duchess of Sutherland

Ross 1986

Duncan, Ursula

Smith 1921

Edelstein, Sidney
 Rosetti 1548
 Schectky 1964

Edmondston, Thomas Jr.
 Duncan 1961
 Edmondston 1844

Eliot, George
 Leggett 1944

Farlow Reference Library, Harvard
 Westring 1805

Federigo and/or Rucellari family
 Crookes 1874
 Gordon 1980
 Rawson, Gardner & Laycock 1918
 Woodward 1949

Gaelic College (St. Anne's, Cape Breton)
 Collister 1944
 MacLeod 1994

Gerber, Fred
 Bliss 1981
 Casselman 1995
 Earle 1898
 Eaton 1937
 Rutty 1772
 Teramura 1984

Goodrich, Frances Lousia
 Eaton 1949

Gordon family (Scottish cudbear)
 Bancroft 1813
 Kok 1966
 Lindsay 1868a
 Ryder 1983

Gorsebrook Institute
 Casselman 2000a

Great Exhibiton*Great Exhibition* 1851

Lindsay 1851

Grierson, S.

Hoffmann 1787

Lindsay 1851

Taylor 1986

Hakon V, King (Magnusson)

Høiland 1983

Hale

Bolton 1960

Hale 1979

Hale & Cole 1988

McGrath 1977

Perkins 1986

Hampton Court Palace (Textile Conservation Centre)

Muthesius 1993

Harris tweed (see subject index)**Hart, Mrs. Ernest**

Hoad 1987

Henderson, Albert

Hoffmann 1787

Lindsay 1851

Henry VIII

Hurry 1930

Hiberno-Norse

Walton 1993

Humboldt Institute (Maine)

Casselman 2000a

Ganong 1889

Gilbertson 1999

Hale 1979

Herald 1993

James, Peter

Bolton 1960

Kok 1966

Kalm, Pehr

Adrosko 1971

Bancroft 1813

Berthollet 1824

Hakluyt 1600

Lathrop-Smit 1978

KilBride, Valentine (Val)

Mairet 1916

Thurston 1930

Kok, Annette

Robinson 1969

Spires 1975

Westring 1805

Laundon, J.R.

Casselman 1980

Casselman 1982

Kok 1966

Westring 1805

Leeds, University (& Brotherton library)

Lindsay 1851

Leix, Alfred

Born 1937

Leverhulme, Lord

Eaton 1949

Lévi-Strauss

Samuel 1987

Lindsay, William Lauder

Lindsay 1856

Linnaeus

Jorlin 1759

Watson 1757

Westring 1805

Llano, George A.
Casselman 1993a
Hoffmann 1787

Lund family (Norwegian korkje)
Høiland 1983

Lunde, Dagmar
Almedal 1986
Casselman 1999

MacLeod, Eveline
Carlson 1997

Mairet, Ethel
Mairet 1916
Kilbride 1979

Marcotti family
Woodward 1949

Morris, William
Taylor 1985

Mullins, Barbara
Antúnez de Mayolo 1976/77

New York Public Library
Woodward 1949

Nova Scotia Museum
Ganong 1889
Lindsay 1851
Smith 1835

Pasold Research Fund
Geijer 1979
Partridge 1823
Ponting 1973

Pliny the Elder (Gaius Plinius Secundus)

Gardner 1896

Sandberg 1997

Taylor & Walton 1983

Pourrat, Henri

Soeurs de l'Ecole 1941

Richardson, D.H.S. (David)

Casselman 1993a

Gordon 1786

Kadolph 1999

Lal & Upreti 1995

Roberston, Seonaid

Casselman 1982

Roscoe, Barley

Casselman 1982

Royal Botanic Gardens (Edinburgh)

Clark 1982

Lindsay 1851

Rucellai Family (see 'Federigo')

Sandberg, Gøsta

Casselman 1993d, 1996b

Sandberg 1997

Westring 1805

Society of Dyers and Colourists (UK)

Huebner 1934

Sr. Marie-Alphonse d'Avile

Soeurs de l'Ecole 1941

Textile Research Associates (York, UK)

Barber 1991

Pritchard 1984

Taylor & Walton 1983

Walton 1989

Theophrastus

Leggett 1944, 1949

Thompson, John

Isham 1743

Thurstan, Violetta

Fraser 1983

Thurston 1930

Toronto, University of

Perkins 1986

Upton, June

Casselman

Rutt 1990

Verterheim Norwegian-American Museum

Casselman 1996c

Gilberston & Colburn 1997

Nelson 1998

Westring, Johan P.

Mairet 1916

Sandberg 1997

Smith 1921

Westring 1805

Whitehead, Ruth Homes

Ganong 1889

Winchester, College

Furley 1927

World Crafts Council

Aiken 197

Lesch 1970

Zopf, Friedrich

Culberson 1969

Smith 1921

PLACE INDEX

Locations given here are general or specific places mentioned in the annotation of the more significant sources in this bibliography.

Africa

Karmous & Ayed 1999 (Tunisia)
Lindsay 1868a (Mozambique)
Moxham 1986 (Morocco)
Perkins 1986 (Angola, Madagascar, etc.)
Rawson, Gardner & Laycock 1918
Stenhouse 1848 (Angola, Mozambique)

Appalachia (see USA)

Arctic (see also Greenland, Norway)

Kåfjord Kommune 1997
McGrath 1977

Asia (see also Japan, India)

Barber 1999
Hakluyt 1600
Hofmann 1997 (Indonesia)
Sandberg 1997

Australia

Casselman 1997a, 1998a
Duncan 1973
Filson & Rogers 1979
Lloyd 1971
Martin & Child 1972

Babylonia

Forbes 1964
Perkins 1986

Britain (see also Scotland, Ireland, Shetland, Wales. etc.)

Benfield 1896 (Devon)
Clow & Clow 1954
Furley 1927 (Winchester)

Hartley 1939, 1979
 Henderson 1984/5 (Leeds)
 Hunt 1995
 Hurry 1930
 Lawrie 1949
 Lindsay 1851-1868
 Mairet 1916
 Ponting 1980
 Pritchard 1984
 Robertson 1969
 Taylor 1986, 1990 (Roman Vindolanda)
 Taylor & Walton 1983 (Roman York, etc.)
 Thurstan 1930

Canada

Arctic

Chambers 1980, McGrath 1977, Sauvé 1977

British Columbia

Brough 1984
 Purkiss 1927
 Samuel 1987
 Turner 1979
 Turner et al 1990
 Windt 1970

Cape Breton Island (N.S.)

Chiasson 1972
 Chiasson & Deveau 1985
 Collister 1944
 Huntingdon 1961
 Mackley 1967
 MacLeod 1994

Manitoba (Hudson's Bay)

Isham 1743

New Brunswick

Ganong 1889

Newfoundland & Labrador

Isham 1743
 McGrath 1977
 Pocius 1979

North West Territories**Bliss 1981****Nova Scotia:****Carlson 1997****Casselman 1978, 1979, 1980, 2000a, 2000c****Richardson 1968****Labelle 1995****Lock 1981****Smith 1835****Stronach 1940-42****Wallis & Wallis 1955****Ontario****Aiken 1970****McGuffin 1986****Prince Edward Island****Burnham & Burnham 1972****Smith 1934****Quebec****Bennett 1998****Beriau 1933****Canadian Handicrafts Guild 1916****Sauvé 1977****Soeurs de l'Ecole 1941****Crete****Barber 1991****Denmark (& Færoe Islands)****Bærentsen 1987, 1994 (Færoe Islands)****Clark 1982****Fischer 1720****Jensen 1977 (Færoe Islands)****Nielsen 1972****Rosenberg 1752****Svabo 1782 (Færoe Islands)****Trøllanesi 1972 (Faeroe Islands)****Walton 1988, 1991 (Iron Age Denmark)****Europe (in general); see also Italy, etc.****Brunello 1973**

Cooksey 1997
Hoffmann 1787
Llano 1944, 1951
Sandberg 1997

Finland

Hellén 1918
Klemola 1978
Kontturi 1947

France

Berthollet 1804
Cardon 1990
Dallon 1997
Furley 1927
Hellot 1789
Moxham 1986
Pomet 1694
Tievant 1979
Westring 1792/4
Willemet, Amoureux & Hoffmann 1787

Germany

Smith 1921
Walton 1988

Greece

Barber 1994
Caley 1926, 1927
Crookes 1874

Greenland

Walton Rogers 1993

Holland

Brightman & Laundon 1985
Pomet 1694
Westring 1805-9

India and/or Ceylon

Lal & Upreti 1995
Llano 1944
Robinson 1969
Sheshadri 1966

Ireland

Aiken 1970 (Dublin)
Boland 1904 (Donegal and west)
Hart 1898 (Donegal)
Hoad 1987 (Donegal & west)
Mahon 1983
McClintock 1950
Mitchell 1978
O'Curry 1873
Rutty 1772
Ryan & O'Riordan 1917
Taylor 1986 (Viking Dublin)
Taylor & Walton 1983 (Viking Dublin)
Walton & Taylor 1991 (Viking Dublin & Norway)

Italy

Born 1937 (ancient)
Caley 1926/7 (ancient)
Muthesius 1993 (ancient)
Plinius 77
Rosetti 1548 (Venice)
Woodward 1949 (medieval Florence)

Japan

Asahina & Shibata 1971
Kåfjord Kommune 1997
Teramura 1984, 1992

Mexico

Ellis 1769
Hale & Cole 1988 (Baja)
Herald 1993
Perkins 1986 (Baja)

Netherlands (see Holland)**New Zealand**

Casselman 1993b, 1996a, 1997a
Duncan 1973
Filson & Rogers 1979
Gordon 1980
Martin & Child 1972

North America (see Canada, the United States)

Norway

Almedal 1986
 Baerentsen
 Bremnes
 Casselman 1993a,d, e, 1994a, 1996c, e, 1999
 Høag 1976
 Høiland 1983
 Kåfjord Kommune 1997
 Kjellmo 1996
 Lindsay 1851
 Lunde 1976
 Lye & Lye 1981
 Nelson 1998
 Walton 1988

Peru (see South America)

Saudi Arabia

Abdulla & Davidson 1996
 Lal & Upreti 1995

Scotland (includes Fair Isle; Shetland; Orkney; Outer Hebrides)

Adam 1934
 Casselman 1993d,e,1995, 1996e, 1998b, 2000a, 2000b
 Dunbar 1962
 Duncan 1961 (Shetland), 1963 (Fair Isle)
 Edmondston 1844 (Shetland & Fair Isle)
 Fenton 1978
 Goodrich-Freer 1902
 Gordon 1786
 Grant 1961
 Grierson 1986
 Grierson, Duff & Sinclair
 Harriss 1998
 Johnson & Boswell 1775
 Kilbride 1979 (west highlands)
 Lindsay 1868b (Outer Hebrides)
 Logan 1833
 MacKay 1976 (Hebrides)
 MacKay 1924 (Portree; highlands/islands)

MacKay 1900 (highlands)
 Maclagan 1898
 MacLean & Carroll 1985
 Manners 1978 (Hebrides)
 Martin 1695 (Hebrides)
 Richardson 1975 (Hebrides)
 Ross 1896 (highlands)
 Rutt 1990 (Fair Isle)
 Shaw 1986 (South Uist, Hebrides)
 Shaw Campbell 1947 (Hebrides)
 Sutton & Carr 1980
 Yeadon 1990

South America

Antúnez de Mayolo 1976, 1989 (Peru)
 Gardner 1868 (Peru)
 Stenhouse 1848 (Peru)

Spain

Ellis 1769
 Gonzáles-Tejero et al 1995
 Hakluyt 1600 (Tenerife & Canary Islands)
 Jaggard 1705
 Napier 1875
 Perkins 1986 (Spain, Portugal, Canary and Cape Verde Islands)
 Smith 1921 (Canary & Cape Verde Islands)

Sweden

Berthollet 1824
 Casselman 1992b, 1993d,e
 Hellén 1918
 Jorlin 1759
 Llano 1944
 Sandberg 1997
 Westring 1805

Switzerland

Lindsay 1868a
 Smith 1921

Turkey (and/or Byzantium)

Muthesius 1993
 Sandberg 1997

United States (these are a mere sampling)**northeast & New England**

Casselman 1980, 1991, 1992c, 1993a, 1994b, c, d, 1996c, 1997b;
 Eaton 1949; Hills 1857; Rambo Walker 1840

northwest (and Alaska)

Chambers 1980
 Duncan 1972
 Merrill & Haight 1975
 Samuel & Higgins 1974

midwest

Gilberston & Colburn 1997
 Green 1975

south

Earle 1898
 Gerber & Gerber 1969, 1973
 Viner & Viner 1946

southwest

Amsden 1934
 Brough 1988
 Dean 1994

west & west coast

Hale & Cole 1988
 Ligon 1988

Wales

Bolton 1960
 Casselman 1982, 1992d, 1992e
 Jenkins 1969
 Rutty 1772

Yugoslavia

Moxham 1986

ACKNOWLEDGEMENTS

Many institutions and individuals have assisted my work. Important contributions were made by private and public agencies that supported research. These include the Atlantic Spinners & Handweavers, Canada Council, Department of Foreign Affairs & International Trade, Gorsebrook Institute, Helen Creighton Folklore Society, Humboldt Research Institute, Nova Scotia Arts Council, Nova Scotia Museum, Pasold Research Fund and the Sheila Hugh Mackay Foundation. 1999 research in Arctic Norway was assisted by the Senate Graduate Committee, Saint Mary's University, whose support is hereby acknowledged with gratitude.

Individuals who brought my attention to rare and unusual sources, a number of which are now in my library, include: Peggy Buckingham, Jenny Dean, Karen Finch, Ing Flint, Laurann Gilbertson, Margaret Hamelin, Judy Harris, Albert Henderson, David Hill, Nancy Hillenberg, Barrie Kavasch, Pirkko Karvonen, Sarah Killam, Winonah Kondolf, Hildur Krog, Gerd Mari Lye, Sharon MacDonald, Aagot Noss, David Richardson, Wendy Robertson, Maura Scannell, Mark Seaward, June Upton, and Liz Williamson.

Among librarians who deserve special mention are Sylvia Fullerton (Killam Library, Dalhousie University), Sandra Hamm (Saint Mary's University), Maureen Williams (Father Brewer Celtic Collection, Saint Francis Xavier University) and my sister, Cynthia Tanner, British Columbia Legislative Library.

Special thanks are due to Rita Adrosko who showed me Pomet; Dorothy Burnham who made me aware of Isham 1743; George Llano whose copy of Westring 1805 it is now my pleasure to own; Gøsta Sandberg who shared his treasures with me; Penelope Walton who first noted Pliny and Furley; and Ted Casselman, who gave me Lindsay's 1856 book as an anniversary gift. I would have no knowledge of Færoese sources had not Jill MacLean given me Gunnvør Bærentsen's book, and then urged me to go, myself.

My awareness of Norwegian literature is due to what the sixty-odd members who belong call the 'Norwegian Breakfast Club.' Members Laurann Gilberston, Kay Larson, Lila Nelson, and Betty Johannesen have made dyes with me, shared research and travel, translated and edited, and generally assisted this research by providing in each case an example of excellence. Special thanks as well to the Sami dyers of Manndalen, Norway, who tended the dye pots.

In some cases translation assistance is noted in my annotations; others who helped in this important way include: Brigitta Wallace Ferguson, Laurann Gilberston, Kay Larson, Marjatta Rautiala, and Inger Vågen. Self-translations by Reidun Almedal and Gunnvør Bærentsen were indispensable.

There would have been no reason to do this project without Marie Aiken; and no motivation to continue without the work of Annette Kok, Patricia Perkins and Penelope Walton.

Without Janet deBoer and Peggy Buckingham Australian research would not have occurred.

Nor would I have met Ing Flint and Katie Syme, dyers whose passion for their work mirrors mine. Jim Liles introduced me to Fred Gerber, before it was too late; Su Grierson, to Winnifred Shand; and I thank Jack Laundon for offering to accompany me to find Kok. Julia Bolton Holloway helped me see that there was one way to encounter Eileen Bolton's spirit. Gunnell Sandberg made my time with her late husband more memorable with each passing day.

I wish to thank Jean Boyes (the Farlow Reference Library and Herbarium, Harvard), the late Mason E. Hale, Jr. (Smithsonian Institution), Jack Laundon (British Museum Natural History), and Brian Coppins (Royal Botanic Gardens, Edinburgh) for access to important herbarium collections which is how I learned. My ethical education is due to Jack Laundon, David Richardson, and Rex Filson, all of whom provided a response that indicated we were on the right track.

The change in my name honours my parents, Pauline and Fred Diadick. Their granddaughter Tracy Stonnell Casselman, and son-in-law Ted Casselman, both of whom are students at Saint Mary's University, have shared the driving, gardening and proof-reading without which help I could not have completed this thesis and my course work, along with a book manuscript, all in one year.

Colin Howell is responsible for educating me in regard to the interdisciplinary nature of historiography and issues of cultural hegemony. John G. Reid, my thesis advisor, introduced me to a broader concept of material culture through the work of Jules David Prown; he helped me to see the gender in culture, myself in the arts, and recognize inside/outside as the dominant group model of Raymond Williams. That I came to understand my subject as a useful tool in postmodern analysis is because of Professor Reid's guidance in this regard.

I sincerely thank my readers for their diligence and patience. Sara Kadolph and David Richardson's cogent discussions with me and their helpful comments on drafts helped refine and focus my ideas. They would not let me avoid the implications of my findings.

This thesis would have much less value without the careful eye of Patrick Power Reference Librarian Douglas Vaisey whose keen interest in Jorlin, Linnaeus, Westring and others, not to mention praxis, made a substantial difference.