

## **SUBMISSION FROM DR HUGH CHEAPE**

### **TARTANS, DYE ANALYSIS AND HIGHLAND DRESS**

The National Museums Scotland [NMS] established a multi-disciplinary investigation of the use and significance of colour in tartan, particularly in surviving fabrics of the eighteenth and early-nineteenth centuries, and a research project ran in three phases between 1996 and 2007. Tartan is a distinctive and familiar badge of Scotland and considered widely to be a form of national dress with traditional antecedents. A large and important collection of tartans and Highland dress in the National Museums Scotland was drawn on extensively for a spectacular exhibition in 1988 held at the Fashion Institute of Technology [FIT] in New York and the topic repeated in Scotland in different format in the Edinburgh International Festival in 1989. These enterprises prompted staff to examine tartans more closely and to attempt to offer more by way of history and interpretation, particularly in the light of the 'invention of tradition' thesis and reassessment of the significance of tartan for Scottish culture.

Further work, essentially scientific analysis combined with historical research, was initiated in 1996 following a request to authenticate a fragment of tartan which was said to be a piece of a kilt worn by Bonnie Prince Charlie in 1746. A project began with the investigation of the historical background of this small scrap of tartan, and this and a number of other tartan fragments formed an exhibition on 'Prince Charlie's Tartan' in the National Museums Scotland commemorating the 250<sup>th</sup> anniversary of the Jacobite Rising of 1745-46. This exhibition ran from 23 June until 29 September 1995 and generated a great deal of interest and one or two further donations of tartan fragments associated with Prince Charlie. The exhibition claimed, as far as the evidence allowed, to have discovered the only authenticated tartan actually to have been worn by Prince Charlie and even by the Royal Stewart dynasty.. Detailed historical research revealed a compelling story of loyalty and self-sacrifice. Scientific study of the fragment's wool and dyestuffs told us more about how and when it might have been made.

The sett of the Prince's tartan appeared to have an overcheck of red and yellow lines on a blue and green 'ground'. The colours of blue, derived from indigo, and red, derived from cochineal, were popular and fashionable colours in tartan in seventeenth and early-eighteenth century Scotland. Microscopic analysis of the fibres of three fragments of the same historical relic (dispersed in three museum collections) showed that the wool came from much the same fleece-type associated with native breeds of pre-Improvement sheep with shorter fleeces of a finer wool.

The analysis of this and other tartan fragments developed after the exhibition in 1995 into an interdisciplinary research project of national and international significance and interest. This has prompted discussion on colour and perceptions of colour, and on the use of colour and colour preferences for tartan and Highland dress. Brightness and variety are the essence of tartan and depend on the availability of good dyestuffs and skills of mixing and applying them. Gaelic tradition indicates that bright rather than muted colours were preferred and, in song and praise poetry of the seventeenth and eighteenth centuries, bright red tartan was the invariable byword for high fashion and status; a phrase such as *breacain charnaid* (i.e. 'scarlet tartans') is a stock metaphor in praise-poetry. It is no coincidence that most of the early surviving portraits with Highland dress show varieties of red tartans. The import of dyes into Scotland from an early date taken with the demand for strong reds in tartan should contradict a perceived remoteness of the Highlands and Islands. There has been a tendency to assume that before chemical and synthetic dyestuffs became available in the early-nineteenth century, natural home-grown dyes only were used in Highland dress and that 'native dyes' must consist of materials available to hand and varying according to localised conditions of climate, geology and flora. In fact, as we have seen, the red and blue of the Prince's tartan, employing the most difficult colours to obtain from native dye-plants, were in fact from the imported dyes of cochineal and indigo.

The NMS survey work broadened to look at surviving tartan fabrics in the national and other collections, for example in the West Highland Museum, Fort William, the Highland Folk Museum and the Inverness Museum, concentrating on well-provenanced material. Research included the making of tartan, the relationship between tartan manufacture and the Scottish textile industry at the time, and the political and cultural significance of tartan around the time of the Jacobite Wars, the

Disarming Acts and the Highland regiments recruited for Britain's imperial wars. Questions asked were whether dyestuffs were derived from native plants or imported, what were the dynamics of dying and trading connections, and what was the nature of the industry between polarities of a handloom in the house and factory production. The Scottish textile industry in the eighteenth and nineteenth centuries was notable for its inventiveness, creativity and entrepreneurial acumen, and leading the field in the production, differentiation and naming of tartans was the firm of Wilsons of Bannockburn who also supplied uniforms for the Highland regiments. In the contemporary atmosphere of European romanticism, this intense activity of supply and demand - a demand which, according to Messrs Wilson, was at times difficult to satisfy - gave rise to assumptions that tartan and Highland dress were inherited from antiquity and that the respective setts or patterns represented immutable and longstanding tradition and a more or less precise badge of clanship. Today a critique prevails, enshrined particularly in the 'invention of tradition' thesis, which developed from a London conference in 1983 and dismissed these concepts.

The NMS tartan and dyestuffs project continued more recently by looking specifically at 'tartans' worn by women and women's plaids. The 'arisaid', for example, was an item of dress worn by women as an outdoor or over-garment, consisting of a large square of fabric, coloured or of tartan, worn over the shoulders, fastened with a brooch and hanging low towards the ankles. As such, it appears to have been a form of 'plaid'. The term 'arisaid' as Scots or Anglo-Scots derives from the Gaelic *earasaid* and indicates significantly that such a garment was a part of Highland dress and merits mention in the early dictionaries of Scottish Gaelic. Evidence for the 'arisaid' is otherwise sparse or the term is not overly conspicuous in contemporary sources. What evidence there is to be found suggests that, although it had been a high-status garment, it was going out of fashion by the late-seventeenth and early-eighteenth centuries. The purpose of this phase of research was to throw more light on the nature of the garment and its history, and to learn more about female dress in a society in which a patriarchal ideology predominated and ultimately supplied the impetus for the creation of a male stereotype of national dress - the kilted Highlander.

Clothes are powerfully indicative of status and there has been a strong 'clothes language' in Gaelic Scotland which was in danger of being lost as the position and status of the Gaelic language had been eroded. The 'arisaid' as object and name was deemed worthy of investigation.

Colour and quality were evidently important for eighteenth and early-nineteenth century tartans and research showed that reds and yellows, for example, which appeared to have been popular in early tartans and supplied the bulk of surviving evidence derived from imported rather than 'native' dyestuffs. Trading connections were vigorous and enabled dyestuffs to be imported into Scotland from an early date. They are evident in the earliest surviving sources, for example, madder and woad in the late-fifteenth century and indigo in the seventeenth century, and insect reds being used rather than madder when they became available. These materials became widely available through travelling traders and a dynamic network of fairs and markets. Demand and expectations were high in areas now perhaps perceived as remote from the larger market centres and evidence showed that there was regular and frequent communication between the Hebrides and the Clyde.

Analysis of a considerable number of samples showed that cochineal was used in order to give a more dramatic and colour-fast red and, with tin mordants, cochineal was consistently brighter than madder. Yellow dyes identified in analysed samples more often derived from native plants such as heather, bog myrtle and gorse and trees such as silver birch and willow, but dyestuffs from imported materials such as weld and old fustic were also found. In terms of native dyestuffs, heather as a natural yellow dye was very effective, long-lasting and resistant to fading and, from the samples tested, appeared to have been one of the few 'home-grown' colours used. Results showed that imported dyes were greatly preferred to native sourced materials and that perceived remoteness from markets did not significantly affect patterns of demand. The NMS Dye Analysis project has demonstrated the value of museum collections for evidence-based research and the research processes and results have been disseminated in peer-reviewed journals and in talks to specialist groups.

## **Publications by National Museums Scotland relating to dyestuffs and dye analysis, 1996-2008**

A. Quye, J. Wouters & J.J. Boon, 'A preliminary study of light-ageing effects on the analysis of natural flavonoid-dyed wools by PDA HPLC and by DTMS', *ICOM Committee for Conservation*, 11th Triennial Meeting, Edinburgh 1996: 704 - 713.

A. Quye & J. Wouters, 'An application of HPLC to the identification of natural dyes', *Dyes in History & Archaeology* 10 (1992): 48 - 53.

A. Quye, 'Dye analysis undertaken in the NMS between October 1989 and September 1990', *Dyes in History & Archaeology* 9 (1991): 27 - 31.

A. Quye, J. Wouters & J.J. Boon, 'Fading hopes for dyes analysis?', *Dyes in History & Archaeology* 14 (1997): 55 - 69.

E.S.B. Ferreira, A. Quye, H. McNab, A.N. Hulme, J.Wouters & J.J. Boon, 'The analytical characterisation of flavonoid photodegradation products: a novel approach to identifying natural yellow dyes in ancient textiles', in J. Brigland (ed), *Preprints of the 12th Triennial Meeting of the ICOM-Committee for Conservation* Vol. I, James & James, London (1999): 221 - 227.

A. Quye, 'Simply red, naturally', *Chemistry Review* 8 (5) (1999): 27 - 31.

A. Quye, 'Lac - resin and dye producer', *Chemistry Review* 8 (5) (1999): 34.

A. Quye, 'Really wild dyes', *Chemistry Review* 9 (2) (1999): 2 - 6.

E.S.B. Ferreira, A. Quye, H. McNab, A.N. Hulme, J.Wouters & J.J. Boon, 'Development of analytical techniques for the study of natural yellow dyes in historic textiles', *Dyes in History & Archaeology* 16/17 (2002): 179 -186.

H. Rawson, J. Burnett & A.Quye 'The import of textile dyes to Scotland: the case of William Wilson and Son, tartan weavers of Bannockburn, 1780-1820', *Review of Scottish Culture* 13 (2000), 18 - 29.

E.S.B. Ferreira, A.Quye, H. MacNab & A.N. Hulme 'Photo-oxidation products of quercetin and morin as markers for the characterisation of natural flavonoid yellow dyes in ancient textiles', *Dyes in History & Archaeology* 18 (2002): 63 - 72.

A. Quye, H. Cheape, J. Burnett, E. Ferreira, A. Hulme & H. McNab, 'An historical and analytical study of red, pink, green and yellow colours in quality 18th and early 19th century Scottish tartans', *Dyes in History & Archaeology* 19 (2003): 1-12.

John Burnett, Katherine Mercer & Anita Quye, 'The practise of dyeing wool in Scotland c. 1790-c.1840', *Folk Life* 42 (2003-2004)

H. McNab, A. Hulme, E. Ferreira & A. Quye, 'The natural constituents of historical textile dyes', *Chemical Society Reviews*, 33, (2004): 329-336

A. Quye, 'Investigating the Scottish tartan', *Education in Chemistry*, March 2004, 40 - 43.

A.N. Hulme, H. McNab, D. Peggie & A. Quye, 'Negative Ion Electrospray Mass Spectrometry of Neoflavonoids', *Phytochemistry* 66 (23), (2005), 2766 – 2770.

H. Cheape and A. Quye, 'Historical and analytical research of dyes in early Scottish tartans', in Rob Janaway and Paul Wyeth (eds.), *The Scientific Analysis of Ancient and Historic Textiles*, AHRC Research Centre for Textile Conservation and Textile Studies Annual Conference, July 2004. London: Archetype Publications Ltd 2005: 202-207.

A. Quye and H. Cheape 'Rediscovering tartans and highland dress', *The Tartan Banner* TECA Newsletter (The International Association of Tartan Studies, Coatesville, Pennsylvania Winter 2004), 1-4.

H. Cheape *Tartan. The Highland Habit* NMSE Publishing, Edinburgh (3rd Edition) 2006, 112 pages.

D. Peggie, 'The Development and Application of Analytical Methods for the Identification of Dyes on Historical Textiles', PhD thesis, University of Edinburgh. May 2006.

Hamish McNab, Ester S. B. Ferreira, Alison N. Hulme and Anita Quye, 'Negative ion ESI-MS analysis of natural yellow dye flavonoids – an isotopic labelling study', *International Journal of Mass Spectrometry* (forthcoming)

A. Quye and H. Cheape, 'Rediscovering the Arisaid', *Costume. The Journal of the Costume Society* 42 (2008) (forthcoming)

D.A. Peggie, A.N. Hulme, H. McNab, A. Quye, 'Towards the identification of characteristic minor components from textiles dyed with weld (*Reseda luteola* L.) and those dyed with Mexican cochineal (*Dactylopius coccus* Costa), *Microchim Acta* (2007) (forthcoming)