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NSCG Newsletter

Title: Tenth Annual Society for the Preservation of Natural History Collections meeting and herbarium workshop 2-6 June 1995

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Source: Purewal, V. (1995). Tenth Annual Society for the Preservation of Natural History Collections meeting and herbarium workshop 2-6 June 1995. *NSCG Newsletter, Issue 1*, 6 - 7.

URL: <http://www.natsca.org/article/774>

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problem of running a museum in an active war zone!

The third and fourth days made up the Herbarium Workshop. The ROM director, John McNeill, welcomed participants to the two day workshop and commented that herbaria had not changed that much since the times of Linnaeus. He also expressed concern at the non-standard approach of modern taxonomists using variation as opposed to sub-species in the lowest taxon. Preventative conservation measures were discussed during the first of these workshop days and included such subjects as collection risk evaluation, air conditioning for a herbarium, insect problems and coping with freezing so as not to destroy seed viability; the suitability of herbarium papers, inks and adhesives and recent developments relating to these materials. The evening was taken up with a most useful 'bazaar' - an exchange of latest developments, ideas and technology relating to herbaria.

Subjects for the second day of the workshop revolved, initially, around bar-coding - the pro's and con's, suitability for large collections and ease of accessioning and updating. The remainder of the day discussed techniques, ideas, loan policies and techniques surrounding destructive sampling of both plant and animal tissues for DNA extraction¹.

Simon's poster was centred on problems encountered with RH when trying to store entire (freeze-dried) fungal sporocarps. It also outlined the arguments for starting a more scientific mycota herbarium in such a fungal rich county as Hampshire. Although not intended to be an in-depth scientific review about conserving collected fungi it was aimed at just the correct level to provide the contacts and feedback essential to the setting up of such a herbarium. Over the next few years the information gathered at this conference should manifest itself as a county mycology herbarium.

¹If you require a longer report, please write to:

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Tenth Annual Society for the Preservation of Natural History Collections meeting and herbarium workshop 2-6 June 1995

The conference, as expected, was of a high standard and addressed many interesting and relevant topics covering several aspects of conservation. However, although the topics covered were of considerable interest, it was difficult to relate them to my own discipline, that of botanical conservation. Nevertheless, I was pleased that on this occasion a two day herbarium workshop was held towards the end of the conference. The workshop involved presentations and slide shows, question and answer time with a small parcel of specialists and finally a poster session. The talks were interesting and addressed practical issues, the question time was informative but brief, and the poster sessions of a high standard.

Topics covered included studies on the stability of materials used in botanical conservation, the conservation of herbarium specimens with a view to DNA sampling and the advantage of heat ventilating air conditioning (HVAC) systems. Particularly relevant were presentations assessing materials frequently used in botanical conservation. Jane Down (CCI) reviewed a range of adhesives used for mounting specimens on herbarium sheets. Whether it is better to strap or glue has always been a conjectural point. She concluded that regardless of the adhesive used, it would eventually become acidic and discoloured and that the best and most stable material available was gelatin-backed linen tape, which is the method currently used at the National Museum of Wales. The following debate failed to resolve the matter but it appears that the majority of institutions continue to use glue, though a few actually glue and strap.

Although methylcellulose has been used for sometime as an adhesive in paper conservation, and has many other uses including the softening of old adhesives to aid removal, it has only recently been employed in botanical conservation. It appears to remain flexible for some time once dry. Sodium carboxyl methyl cellulose is also used in some institutions but this has generally been abandoned by paper

conservators in favour of methyl cellulose which is more stable.

Several other presentations addressed the use of inks in label writing and the accessing of specimens. The permanence of inks from both pens and printers was compared by assessing the extent of fading, solubility, and adhesion. It was interesting to see the degree to which these properties varied. The best pens were found to be Rotring 17, Pigma and Marsgraphic pigment liner., but the printers whilst having some advantages, were limited in their usefulness. For example bubble-jet is soluble in water and this may present problems in recovering specimens following a water related disaster (e.g. fire and flood).

Julia Fenn (ROM) presented a talk at the main conference on the reactions of chemicals on plastics. She deduced that over a period of time several pesticides may have been applied to the same specimen and almost invariably, such treatment will not have been documented. Moreover, she discovered that the use of several pesticides in succession may have a synergistic effect on plastic deterioration although a combination of a few pesticides have little adverse effects. These effects include changes in the stability of the plastic, its pH, opacity and increased brittleness.

At the herbarium workshop Julia concentrated on selection methods used in choosing suitable plastics for specific uses. Tom Strang (CCI) addressed the effects of heat on plant specimens during pest control. He showed that by placing the material in a sealed chamber heated to 55°C (131°F) and maintained at a relative humidity of 50%, that after eight hours all the proteins were denatured, destroying all stages in the pest's life cycle. DNA, however, is affected to a lesser extent, some seed remaining viable and capable of germination following such treatments. The use of relatively high temperatures as a mean of pest control went initially against the grain since most institutions are accustomed to freezing their specimens. In general, $Q_{10} = 2$, that is for every 10°C (50°F) rise, the rate of chemical reaction doubles. Thus, heating specimens will accelerate chemical changes and may result in the loss of wax and solvents and may cause damage to membranes, cuticles and hairs. Numerous preliminary tests have

been conducted and so far there seems to be little evidence of immediate damage to specimens. Consequently, the use of heat presents many advantages especially as it reduces the time required to treat collections. However, the long term effects require careful monitoring since the effect of heat on DNA and the vast array of complex chemicals found within lichens remains largely unknown.

The second day of the workshop concentrated on the herbarium as a source of DNA samples, the correct code of conduct while working on a herbarium specimen and the conditions required to prevent DNA destruction. I found this a very important session as I felt it gave guidelines to areas which had previously been neglected. Inevitably, this led to lively discussion.

The four days in total were a mine of useful information and the conferences were conducted in such a way that an enjoyable time was had by all.

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Managing the Modern Herbarium

With no time to recover from the packed and invigorating programme of the SPNHC conference, 95 delegates including myself ploughed straight into the training workshop 'Managing the Modern Herbarium'. This ambitious event was organised by Ann Pinzl (Nevada State Museum) and Deborah Lewis (ROM). Those from the conference who weren't herbarium orientated could go on a tour of the ROM's collections and facilities, or (and I can't remember seeing this in the programme) visit Niagra Falls, go up the CN Tower, 'shop' etc.! Anyway we die-hards arrive at Monday 8am to register for what was to become two days of discussions, activity and productive debate.

John Townsend, a preservation consultant and information specialist began the first day by presenting a talk on 'preventative conservation' and how an effective programme of this could be a tool for 'managing' the deterioration of natural history collections. John identified the four factors which contribute to this inevitable deterioration: biological, physical, chemical and environmental, and how by slowing or interrupting these processes, a long term