Vegetation Management on Memorials and Monuments
Management must start with a Management Plan

• Overall presentation
  • Neat and Tidy
  • Wild and Overgrown
  • Mixture of both

• Conservation/Presentation priorities
  • Listed buildings/monuments
  • Important historic buildings/monuments
  • Everything/nothing

• Future maintenance
  • Realistic maintenance levels
  • Don’t create maintenance problems unnecessarily
Types of Vegetation

• Higher Plants
  • Trees & Shrubs
  • Woody herbaceous perennials
  • Soft herbaceous perennials
  • Annual and ephemeral plants
  • Climbers

• Lower Plants
  • Lichen
  • Moss
  • Liverworts
  • Algae
Trees & Shrubs

- Trees and shrubs, but in particular trees, have enormous ecological potential which increases as they age.
- However, these plants are almost always harmful to built structures when growing on – or too close – to them, with the level of damage increasing as they get older!
- Wherever possible the location of these plants should be carefully controlled
Trees & Shrubs
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Woody herbaceous perennials

- Not woody in the true sense of trees and shrubs, but they can produce growth which is strong and vigorous, capable of pushing stones apart and dislodging them.

- Usually problematic as the plant becomes older and often takes the form of a mass of stems or woody basal growth.

- Examples of this type of plant are Pellitory-of-the-Wall (Parietaria judaica), Valerian (Centranthus ruber), Bramble (Rubus fruticosus) and Wallflower (Cheiranthus cheiri).

- It is frequently necessary to control these plants when they become older.
Woody herbaceous perennials
Soft herbaceous perennials

- Not generally damaging, although growth may dislodge stones on walls in poor condition.
- Examples of this type of plant are Ivy-leaved Toadflax (*Cymbalaria muralis*), Herb-Robert (*Geranium robertianum*) and Mind-your-own-business (*Soleirolia soleirolii*) and the common wall growing ferns such as Broad Buckler Fern (*Dryopteris dilatata*), Polypody (*Polypodium vulgare*) and Wall-rue (*Asplenium ruta-muraria*).
- There may occasionally be a need to control isolated plants of this group.
Annual and ephemeral plants

- Short lived plants, quick growing but rarely very big and not known to be damaging.
- Instances where they appear in cracks indicate taking advantage of opportunities which arise and these plants are never the primary cause of cracks and do not exhibit the growth characteristics to makes such features worse.
- Examples of this type of plants are Fern Grass (*Desmazeria rigida*), Wall Bedstraw (*Galium parisiense*) and Rue-leaved Saxifrage (*Saxifraga tridactylites*).
- There is no reason to control these plants.
Climbers - Ivy
IN

Memorial of

JOHN BOON

Died Oct. 24, 1840

Aged 60 Years

ALSO OF

Mary his Daughter

Who died Nov. 4, 1836

Aged 10 Years
Lower plants

• Lichen
• Moss
• Liverworts
• Algae
Lichen

• Lichen is by far the most common lower plant found on stonework.
• Lichens are a symbiotic organism consisting of a fungus and an algae
• In general they do no harm to the surface of the stone on which they grow.
• Some Lichen have the ability to dissolve the rock/stone on which they grow their slow rate of growth is legendary and although the fungal hyphae from lichen can penetrate up to 15mm into rock surfaces, 1mm is more common
There is a strong argument that a covering of lichen actually slows or prevents the effect of erosion by rain, wind-borne pollutants, sand particles and the freeze/thaw weathering of ice crystals.

Lichen can also be important for monitoring air pollution, which in itself can be damaging to stonework.

On certain types of sandstone, lichen has been shown to cause damage and in these circumstances its removal or prevention is justified.
Moss

• Like lichen moss seems to be a largely harmless and potentially beneficial covering
The Rievaulx Question
Liverworts and Algae

- Liverworts and Algae are only found where walls are permanently damp and usually shaded. Damp conditions are often a problem for historic fabric and these plants are a useful indicator, but do not cause problems themselves – usually disappearing if the damp problem is solved.
Legal and Safety Implications

- Food and Environment Protection Act 1985
- Health and Safety at Work Act 1974
Food and Environment Protection Act 1985

• Under this Act the Control of Pesticides* Regulations 1986 (CoPR) were introduced.

* Under the Food and Environment Protection Act 1985, pesticides are defined as ‘chemical substances and certain micro-organisms prepared or used to destroy pests’. The term therefore encompasses a number of products including (amongst others) herbicides, fungicides, insecticides and masonry biocides

• The Control of Pesticides Regulations 1986 aim to protect human beings, creatures and plants, safeguard the environment, ensure safe, effective and humane methods of controlling pest and make pesticide information available to the public.
Food and Environment Protection Act 1985
Control of Pesticides Regulations 1986 (CoPR)

- Of the numerous controls introduced by these regulations, three are of particular relevance to organisations using pesticides
  1. Only approved products may be sold, supplied, stored, advertised or used.
  2. Users of pesticides must comply with the Conditions of Approval relating to use.
  3. A recognised Certificate of Competence is required by all contractors and all persons born after 31st December 1964 applying pesticides approved for agricultural use (from 26th November 2015 this becomes all persons regardless of age) (unless working under the direct supervision of a certificate holder).
Health and Safety at Work Act 1974

- Under this Act the Control of Substances Hazardous to Health Regulations 1994 (COSHH) were introduced.

- The COSHH regulations require that the risks associated with the use of any substance hazardous to health must be assessed before it is used and the appropriate measures be taken to control that risk. In order of preference these measures should be:
  - Substitution with a less hazardous chemical or product
  - Technical or engineering controls (e.g. the use of controlled handling systems)
  - Operational controls (e.g. operators located in cabs fitted with air filtration systems)
  - Use of personal protective equipment, which includes protective clothing.

- To assist with COSHH assessments, manufacturers will supply product safety data sheets to customers and potential customers.
Health and Safety at Work Act 1974

• Dealing specifically with Pesticides the COSHH Regulations are in addition to (not in place of) the Control of Pesticides Regulations 1986 and require that:
  – Consideration be given to the necessity of using pesticides at all in a given situation
  – The label precautions be used as a minimum
  – Safety equipment and clothing is properly maintained and that staff are instructed and trained in its use
  – Where necessary exposure of workers is monitored and health checks are carried out
  – Adequate records of all operations involving pesticide application must be made and retained for at least 3 years.
What do advisors and specifier’s need?

• The Code of Practice is less than clear; ‘…..you should be sure that the person you ask for advice has the necessary skills, knowledge and experience. Also people who draft contracts should have suitable training and experience to do so…..’ Safest option is to use someone on the BASIS Professional Register
Methods of control

• Environmental Control

• Physical Control

• Chemical control

• Biological Control?
Environmental Control

- Useful under certain conditions and for certain types of vegetation – principally the lower plants like algae and liverworts.
- Removal of the conditions which favour their growth - damp and shaded – will often cause their demise.
- This may be achievable by simple methods such as cutting back overhanging growth from adjacent trees or repairing broken pipes/gutters.
Physical Control

- Most of the physical methods of vegetation control such as hoeing or mulching are not possible on memorials but two methods are possible;
  - Hand removal
  - Cutting
Chemical control – Stump Treatment

• Used in conjunction with cutting. Stumps are drilled or cross cut and treated after the main vegetation is cut off. This method is very targeted and there should be no non-target casualties. It is more effective on stumps over 50mm diameter, possibly because of the amount of chemical which can be applied. Treatment is more effective if carried out immediately after cutting.

• When treating larger stumps some thought needs to be given to what treatment the wall will require as the stump dies and rots away.
Chemical control – Ecoplug System

• A system from the Sweden which is now available in the UK
• Glyphosate filled capsule fitted into a pre-drilled hole and then driven in – bursting the reservoir and releasing the chemical.
• Highly targeted and very safe for operators, the public and wildlife/pets.
• May be used on stumps or standing trees
• 2015 prices £70 + VAT + P&P for drill bit and 100 capsules
Chemical control - Spraying

- Spraying is only practical using hand operated equipment because machinery mounted equipment is designed for use on a horizontal surface. Conventional spraying has three major drawbacks;
  1. Spraying on a vertical surface increases the risk of drift, making even spot treatment difficult to contain
  2. Increased Health and safety concerns for operators if the lance is consistently being used above the head
  3. It is difficult to avoid some surplus chemical running down the vertical face
- Spraying is not recommended except in an unlikely case where total vegetation control was required both on the wall and the surrounding area.
Chemical control – Weed Wiping

Advantages
• There is minimal risk of drift
• Control can be carefully targeted
• Reduced use of chemical
• More environmentally acceptable

Disadvantages
• More labour intensive and therefore more expensive
Biological Control

• Not well advanced in the UK
• Even worldwide, notably successful uses of biological control are scarce;
  • Opuntia by *Cactoblastis cactorum* in Australia
  • Skeleton Weed by the rust fungus *Puccinia chondrillina* in Australia
  • St. John’s Wort by leaf cutting

• Biological control of Japanese Knotweed is currently being tried in the UK