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Plant culture: thirteen seasonal pieces

December – science and ... life

Nicholas H. Battey

This last seasonal piece is illustrated by an old calendar that features in the outer circle the signs of the zodiac, in the middle circle the work dictated by the agricultural year, and in the inner circle a woman in summer and a man in winter (Fig. 1). It shows the close connection between human and plant life in the Middle Ages. Science and technology have changed much of that, but they have also established new links. Here, appropriately for the season, I celebrate the synaesthetic connections that radiate from science into plant culture. December has been used to symbolize not just death, the end of the year, but also evergreen, eternal life and regeneration. Humans are using science to work out how to live longer, and the final stage could be the achievement of an autotrophic near-eternal mortal, a literal creation of the mythical Green Man. Could man adapt to live an eternity, or will plants still reach closer to the perfect?

December is a time of celebration in many traditions, but it is also the season of death. In a medieval 'Book of Hours' depicting the monthly occupations, animals are slaughtered in December to provide food for the winter. And in Edmund Spenser's 'Shepherds' Calendar', from 1579, winter is a symbol of old age and the sense of embittered loneliness of that time of life. Here is a passage towards the end of his 'December':

> The careful cold hath nipped my rugged rind,
> And in my face deep furrows eld hath pight;
> My head besprent with hoary frost I find,
> And by mine eye the crow his claw doth write;
> Delight is laid abed, and pleasure past;
> No sun now shines, clouds han all overcast.
>
> Now leave, ye shepherds' boys, your merry glee;
> My Muse is hoarse and weary of this stound.
> Here will I hang my pipe upon this tree –
> Was never pipe of reed did better sound.
> Winter is come that blows the bitter blast,
> And after winter dreary death does haste.
>
> Spenser, *The shepheardes calender*

What plants tell us, though, is something different. Dormancy, a kind of apparent death, is followed by renewal of life. Robert Graves's tree calendar expresses this characteristic of plants by allocating the yew, tree of death, to December 21, and silver fir, the birth tree, to December 23. Together the two trees symbolize the wheel of existence.

Fig. 1. Woodcut of a zodiac from 'The Shepheards Kalendar, Newly Augmented and Corrected [tr. from Le Compost et Calendrier des Bergers], Lond., 1618'. (Bodleian Library, University of Oxford, Douce C Subt. 214)

At a less symbolic, more practical level the capacity of individual plants to maintain themselves, through vegetative regeneration or simply by persistence, indicates the potential of cells to sustain life (almost) indefinitely. A striking example is provided by the olive trees that stand at the site of the Garden of Gethsemane in Jersusalem, where Jesus is said to have prayed before being arrested. Regardless of what you think about this story, its components of the betrayal, the agony of death, and the resurrection are of profound human significance. It is therefore remarkable that the olive, a tree renowned for its regenerative ability, should feature so centrally in the story. This regenerative power resides in the stem base, where nodules of callus-like tissue give rise to numerous shoots that themselves root. This makes it difficult to accurately define, let alone answer, the question 'are the olive trees in the Garden of Gethsemane those present in the time of Jesus?'. But the sense of immortality is a central one in plant culture, and it has a deep influence on human thought.

The current century has been described by the UK Biotechnology and Biological Sciences Research Council as the century of biology. Yet it is more likely that it will be remembered as the century of eternal life, because it is a reasonable prediction that the end of death by old age will be the next great achievement of science. Forget designer babies and cloning – it is a world of near-eternal mortals (nem) that we are heading towards. Improved understanding of the causes of ageing and senescence will, ultimately, lead us to be redesigned to last longer, and longer, and longer.

One consequence of the ascent of nem for the global population is obvious: humans will have to become ever more self-sufficient, the logical endpoint being autotrophy. Can we engineer chlorophyllous people in this

century of eternal life? Although this may sound far-fetched, science has learnt to do things far more extraordinary in the past 100 years. Our understanding of chloroplast function in plants is advancing rapidly, and we can already express plant genes in animal cells ...

There may be good physiological reasons for doubting that humans could ever practise photosynthesis, but it is interesting to compare chlorophyllous nem with the mythical Green Man. The Green Man is a recurrent figure in church carvings in Europe from the early Middle Ages onwards, a development of demonic images from the previous millenium (Fig. 2). His precise meaning is varied, ambiguous: he has been related to characters like John Barleycorn, Jack in the Green and Robin Hood, and can be seen as a 'Lord of Misrule' who inverts the social order and represents the elemental forces of nature and regeneration. In this way he is, perhaps, a symbol of the victory of life after winter death. On the other hand, his presence on tomb and font may be intended to remind us that our spell on earth is all too brief, and that, in the words of the English verse, 'all greenness comes to withering'.

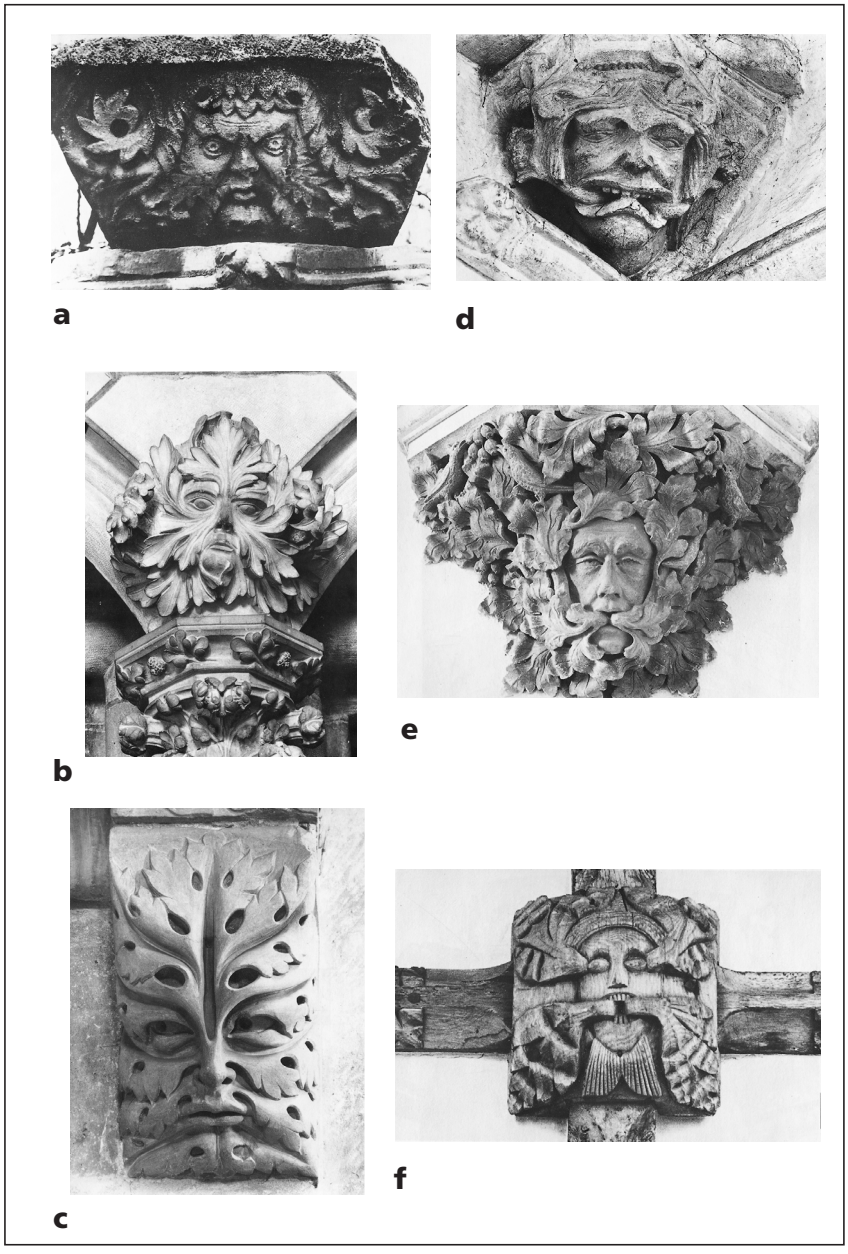

Fig. 2. The Green Man. (a) Demonic (Istanbul, 6th century). (b) Tête de Feuilles, the organic whole (Auxerre, 13th century). (c) Darkness and power of the forest (Bamberg, 13th century). (d) Symbol of infinity (Dorchester, 13th century). (e) Jack in the Green (Sutton Benger, ?14th century). (f) Leaf demon (Sampford Courtenay, 14th or 15th century). Reproduced from Basford (1978) *The Green Man*. Ipswich: D S Brewer, with permission from Common Ground.

Thus the Green Man picks up on both the regeneration of plant life and its evanescence. But for an autotrophic nem, a literal Green Man, the psychological realities of near-eternal existence would be likely to become a serious problem. Faced with the tediousness of great longevity, and the difficulty of retaining a sense of purpose and freshness of perspective, Green Nem might feel a growing envy for the unselfconsciousness of plants.

Life is a gesture towards perfection, a dazzling response to the inorganic universe. Plants reach closer to the perfect, if only because for us, life's end is really too hard to bear:

> Epilogue
>
> He died in December. He must descend
> Somewhere, vague and cold, the spirit and seal,
> The gift descend, and all that insight fail
> Somewhere. Imagination one's one friend
> Cannot see there. Both of us at the end.
> Nouns, verbs do not exist for what I feel.
>
> *Epilogue* from *Collected Poems* by John Berryman.
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Bibliography

Basford K. 1978. *The Green Man*. Ipswich: DS Brewer.
Berryman J. 1990. Collected poems 1937–1971. Edited by Charles Thornbury. London: Faber & Faber.
Graves R. 1948. *The white goddess: a historical grammar of poetic myth.* London: Faber & Faber.
Kirkwood T. 1999. *Time of our lives: the science of human ageing*. London: Weidenfeld & Nicolson.
Landsberg S. *The medieval garden*. British Museum Press.
Spenser E. 1998. *Shorter poems: a selection*. Edited by John Lee. London: Everyman.

The author

Nicholas H. Battey
Plant Science Laboratories, The University of Reading, Whiteknights, Reading RG6 6AS, UK

Fax: +44 (0)118 3788160. E-mail: n.h.battey@reading.ac.uk