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here by Marr & Shipley (1904), still occurred in ponds in the eastern part of the Garden. Two slugs (*Deroceras panormitanum* and *Limacus maculatus*) also appear to be recent introductions to the county. The final noteworthy species is *Pyramidula pusilla*, a species recently shown to be distinct from *P. rupestris*, to which name all British records had been assigned. *Pyramidula* has not been recorded from Cambridgeshire since 1880 (Kerney, 1999). However, the population in the Cambridge Botanic Garden was almost certainly introduced with blocks of Carboniferous Limestone that were brought in to make the Limestone Rock Garden, constructed between 1954 and 1958.

Watson (1929) also listed five species of exotic land snail that he found only in the hot-houses. Two of these were subulinids, *Opeas goodalli* (= *Opeas pumilum*), and *Opeas urichi* (= *Allopeas clavulinum*). We found no trace of these but did find two different subulinid species, namely *Subulina octona* and *Allopeas gracile*. We were also able to find two other alien species listed by Watson (*Zonitodes arboreus* and *Hawaiiia minuscula*), but failed to rediscover *Helicodiscus parallelus*. However, we did find a fresh shell of the streptaxid *Gulella io*, a native of tropical Africa that was originally described from hot-houses at Kew Gardens and elsewhere (Verdcourt, 1974, 1979). Dissection of a live-collected specimen from the Tropical Fern House at the Cambridge Botanic Garden demonstrated that *G. io* is conspecific with *G. devia* described from Liberia, although the name *io* still has precedence (Verdcourt, 1979). This suite of exotic species occurs widely in European hot-houses.

We thank Fred Naggs for help in identifying the subulinids and Brian Eversham for confirming the identity of *L. maculatus*.

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The lichens of Cambridge walls

Mark Powell and the Cambridge Lichen Group

A paper by Brightman in 1965 presented a survey of the lichens found on walls in Cambridge. A comparison of Brightman's findings with the records made by the Cambridge Lichen Group in 2011 show some interesting changes.

Brightman was well aware of the factors which limited the growth of lichens in the 1960s and the following is an extract from his paper:

Drought and atmospheric pollution are inimical to lichens. The climate of Cambridge may be said to be continental, at least by British standards; the average annual rainfall is 552 mm., and the Meyer precipitation/saturation deficit ratio is 105, the lowest in the British Isles. This no doubt accounts for the absence of the larger foliose and fruticose lichens whose distribution in Britain is restricted to the north west and west. However contrary to the consensus of local opinion, atmospheric pollution in the city is not negligible. The main source of pollution appears to be domestic heating appliances which discharge into the air considerable quantities of soot and also sulphur dioxide.

Brightman's assertion that Cambridge suffered from significant atmospheric pollution was backed up by the readings of lead peroxide gauges which had been published in 1963. Atmospheric sulphur dioxide levels have now fallen below the level where they form a limiting factor for most lichens.

It is particularly interesting that Brightman describes the exact communities present on two named bridge parapets which are still extant and were revisited. The parapets of Silver Street bridge were described by Brightman as follows:

The pioneer species (of limestone walls) have a crustose habit... Verrucaria viridula (brownish green, clear green when wet) is a good example of this; it is, for instance, the most abundant species on Silver Street bridge. Here, together with the only other two species present – V. nigrescens (brownish black) and Candelariella vitellina (orange yellow) – it covers rather less than fifty percent of the surface of the stone.

In February 2011 the lichen cover on the same parapets was estimated to be approximately ninety percent and at least twenty three species were present. The following list gives a visual estimation of abundance for each species recorded on the limestone parapets of Silver Street bridge where (r) signifies that the particular species was considered rare, (o) occasional, (f) frequent and (a) abundant.

Caloplaca decipiens (r), *C. dichroa* (a), *C. flavescens* (r), *C. oasis* (o), *C. teicholyta* (o-f), *C. variabilis* (r), *Candelariella aurella* (r), *C. medians* (f), *Lecania erysibe* (r), *Lecanora albescens* (a), *L. dispersa* (r), *L. semipallida* (r), *Lecidella stigmatea* (r), *Phaeophyscia orbicularis* (r), *Physconia grisea* (r), *Rinodina teichophila* (o), *Verrucaria* cf. *baldensis* (r), *V. fuscella* (f), *V. cf. hochstetteri* (f), *V. nigrescens* (a), *V. n. f. tectorum* (r), *V. viridula* (r), *Xanthoria parietina* (r).

Verrucaria viridula is reduced to three small individuals, *V. nigrescens* is abundant while *Candelariella vitellina* is no longer present. *Caloplaca dichroa* is a recently described (Arup, 2006) member of the *C. citrina* group with distinctive thick-walled spores. *Caloplaca oasis* is a recently described (Arup, 2009) member of the *C. holocarpa* group; it is that member of the aggregate which is most common on limestone and cement with small, tightly clustered orange fruits. The larger foliose lichen species were concentrated beneath overhanging *Salix* branches. *Lecanora semipallida* is a member of the *L. dispersa* group which has bright white or yellowish margins which contrast starkly with the dark thallus and which display a bright orange fluorescence in ultraviolet light.

An extension to the north parapet of Silver Street bridge is built of brick and this was not described by Brightman. Additional species recorded here are *Caloplaca arcis*, *Lecanora campestris*, *L. muralis*, *Lecidella carpathica*, *L. scabra* and *Rinodina oleae*. *L. carpathica* is considered uncommon but it is probably much overlooked.

A similar significant increase in lichen species is demonstrated on the parapets of King's bridge which was described by Brightman as follows:

The sandstone parapet of King's bridge is colonised by only one lichen, the yellowish green crustose species Lecanora conizaeoides.

In February 2011 eighteen species were recorded on the parapets of King's bridge:

Aspicilia contorta, *Caloplaca citrina*, *C. holocarpa*, *Candelariella aurella*, *C. vitellina*, *Lecania erysibe*, *Lecanora campestris*, *L. dispersa*, *L. muralis*, *Lecidella scabra*, *Phaeophyscia orbicularis*, *Physcia adscendens*, *P. caesia*, *Porpidia soledizodes*, *Rinodina oleae*, *R. teichophila*, *Verrucaria nigrescens* f. *tectorum* and *Xanthoria parietina*.

The autumn 1974 field meeting of the British Lichen Society was centred on Cambridge and a report was published by Brightman & Lambley (1978). An extract from the report gives an interesting picture of lichens in Cambridge city nearly a decade after Brightman's original paper:

The walls of the city were examined and yielded 50 species. It was of interest to see if any change had occurred since the lichen flora in the city was reported by Brightman (1965). No loss or serious diminution of species was noted; for instance, the repairs to Clare Bridge have not disrupted its interest as a "garden" of calcicole species. Lecanora muralis has increased considerably as it appears to be doing generally in towns in lowland England; it is particularly well-developed on the low brick wall in front of Queen's College, and also grows on worked timber beside the river which it was not doing 10 years ago. Lichens have increased on Silver Street bridge, though they are still mainly species of Verrucaria. Lempholemma chalazanellum was of particular interest growing on mosses at the base of the parapet. A noteworthy find on Kings Bridge was Acarospora fusca, a species which resembles a depauperate form of A. fuscata. Other species associated with it on this sandstone bridge were Lecanora conizaeoides, Bacidia umbrina and Candelariella vitellina.

The dramatic decline of *Lecanora conizaeoides* in Cambridgeshire has been reported in respect to corticolous communities at Wicken Fen (Powell, 2010) and at Chippenham Fen (Powell, 2011). This species is still sometimes found on weathered lignum, acidic bark and acidic stone but no trace of it could be found surviving on the sandstone blocks of King's bridge. Brightman states that this species was ubiquitous in Cambridge in the 1960s, on sufficiently moist and acid substrata, on walls, roofs and the barks of trees. *L. conizaeoides* was not found on any walls during the 2011 surveys.

An old brick wall beside Silver Street, forming the north boundary of Darwin College, shows a difference in the lichens present on the bricks compared with those on the mortar. The bricks have *Caloplaca flavocitrina*, *Lecanora antiqua*, *L. dispersa*, *Psilolechia lucida* and *Rinodina oleae* while the mortar supports *Candelariella aurella*, *Lecanora albescens*, *Verrucaria nigrescens* and the common blastidiate yellow lichen commonly recorded as *Caloplaca citrina*. Recent genetic work (Powell & Vondrák, 2011) has shown that two taxa are

involved both of which appear to be present on this wall. The paler form with slightly larger blastidia is *C. limonia* while the darker, finer form falls into an unknown clade (*C. aff. austrocitrina*) and requires further study.

The low walls in front of the Cambridge University Library are capped by calcareous coping blocks which support: *Amandinea punctata*, *Caloplaca decipiens*, *C. flavocitrina*, *C. oasis*, *C. teicholyta*, *Lecanora albescens*, *L. campestris*, *L. dispersa*, *L. muralis*, *Protoblastenia rupestris*, *Verrucaria fuscella*, *V. cf. hochstetteri*, *V. nigrescens* and *Xanthoria calcicola*. The shady side of the wall has large colonies of moss and extensive areas of these are covered with *Bilimbia sabuletorum* along with smaller patches of *Agonimia tristicula*.

A further example of calcareous coping stones are the limestone blocks that top the wall bounding the church of Our Lady and the English Martyrs. Species present here are *Caloplaca arcis*, *C. flavescens*, *C. teicholyta*, *Candelariella aurella*, *C. medians*, *Lecanora albescens*, *L. dispersa*, *Lecidella stigmataea*, *Phaeophyscia orbicularis*, *Protoblastenia rupestris*, *Rinodina oleae*, *Verrucaria macrostoma* f. *furfuracea* and *V. nigrescens*.

Concrete coping stones have similar lichen communities to those of limestone but *Caloplaca decipiens* and *C. saxicola* appear to be especially common on concrete. *Sarcogyne regularis* is an inconspicuous species that has black apothecia which are partially immersed in the substratum. It is occasional on mortar and cement and it also colonises concrete where it shows a preference for chalk pebbles within the aggregate.

Some low boundary marker walls are built of, or capped with, blue-black engineering bricks. Even when only a few years old these begin to develop a distinctive community in which *Amandinea punctata*, *Buellia aethalea*, *Caloplaca holocarpa*, *Candelariella vitellina*, *Catillaria chalybeia* and *Lecanora dispersa* are particularly common.

Lecania inundata is an overlooked lichen species. Many British field lichenologists seem to have been unsure of this taxon and have clumped it together with *L. erysibe* into an informal *L. erysibe* sens. lat. grouping. In fact the two species can be separated in the field using the morphological form of the thallus, specifically the presence of verrucae (nodules) in *L. inundata* and of blastidia in *L. erysibe*. The shaded walls of Queen's College which are otherwise of limited interest for lichens, provide a useful comparison of these two species as they grow there in close proximity.

The recent study of Cambridge walls has been far from comprehensive but the results illustrate a couple of important points. The presence of named and easily re-located structures within an urban environment can facilitate useful comparisons over time. The taxonomy of some of the commonest urban lichens is still incompletely understood and repeated observations in convenient locations can provide the experience necessary to question the current understanding of these taxa. Such studies can highlight the likely problems and inform the collection of appropriate specimens for genetic analysis.

To conclude this paper, and hopefully to stimulate further observations, mention should be made of a particular type of brick which was found by Brightman to support an interesting community. His description is as follows:

The most favourable brick for lichens is a sand-faced red brick with a pH of 5.8 and a water absorbing power of 12%. Calcicole species are excluded, but the water content and surface texture encourage the growth of the larger species such as Cladonia fimbriata and the various Physcia species. The crustose species Lecanora sulphurea (greenish grey) and Ochrolechia parella (grey, ridged, rough and granular) may also be found here.

None of the three lichens specifically mentioned in the above extract was found during the 2011 survey of walls but these and many others may await discovery.

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The Establishment of 800 Wood at Madingley

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Introduction

In 2009, the University of Cambridge celebrated its 800th anniversary. To mark this event, the University's Rural Estate department wished to create a significant new woodland, named Octo Centenary Wood (shortened to 800 Wood), to further its existing notable ecological resources which include two SSSI's, two County Wildlife Sites, parkland registered on English Heritage's Register of Parks and Gardens of Special Historic Interest, two lakes, brickpits, water meadows and a wet woodland site, as well as to diversify its predominately arable and grassland landholding.