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# WIGHT STUDIES

**PROCEEDINGS**
**OF THE**
**ISLE OF WIGHT NATURAL HISTORY**
**AND ARCHAEOLOGICAL SOCIETY**

Volume 35

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# ISLE OF WIGHT
# NATURAL HISTORY AND ARCHAEOLOGICAL SOCIETY

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The Society was founded in 1919. Its activities include the study and conservation of the flora, fauna, archaeology and geology of the Isle of Wight. General and section meetings, lectures and excursions are arranged throughout the year and advertised on the Society's website. Proceedings and a Bird Report are published annually; Bulletins and Programmes twice a year. A periodic electronic communication is available on request. All these publications are issued without further charge to members.

**Subscriptions**

| | |
|---|---|
| Ordinary Membership | £20 |
| Family Membership | £25 |
| Full Time Student Membership | £10 |

(Application forms and other information are obtainable from the General Secretary or Society website)

**Cover photographs**

**Top left:**
Male stonechat *(Saxicola rubicola)* on Compton cliffs (Tina Harknett)

**Top Centre:**
Starry sea squirt *(Botryllus schlosseri)* on serrated wrack at Bouldnor (Roger Herbert)

**Top right:**
Glanville fritillaries *(Melitaea cinxia)* mating on a south-facing slope at Brighstone Shute (Keith Marston)

**Bottom:**
View across Brading Marshes from Brading Down (Mike Cotterill)

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Notes regarding submissions are printed at the end of this volume.




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**Contents**

## Editorial

This is the second editorial we have written during the COVID 19 pandemic. The Society has continued to function, albeit in somewhat restricted and different ways in the last eighteen months. Our centenary celebrations, like everything else, were severely disrupted. Instead of the planned conference, at the end of March and beginning of April 2021 the Society held a series of webinars on the theme 'Environmental Change: past, present and future'. The 'broadcast audience' averaged over 100 for each of the four sessions, and subsequent uploading to our YouTube channel has allowed people who missed sessions to catch up at a convenient time.

Our natural history records have had a great emphasis on individuals recording in their gardens and immediate locality, and the number of entries on the online recording platforms, *iRecord* and *iNaturalist,* has grown steadily over the last three years. The archaeologists have continued their studies via video conferencing. Field meetings of all sections have now restarted in a limited way, and we hope that the next programme will be a full one, and able to proceed as planned.

We were pleased to receive positive comments following the issue of last year's Wight Studies in its new two column format and are grateful to Chris Brailsford of Biltmore Printers who has assisted us through another year of largely remote working. As ever, we are extremely grateful to all our contributors. John Margham very kindly wrote his article on the Island's population at special request, and next year we are planning a paper which will look at population change from 1800 to the present day. We hope the article by Alex Peaker on new Isle of Wight geological discoveries, and additions to the Museum of Isle of Wight Geology, will be a regular feature.

There are no archaeology articles this issue, but we anticipate that a report on the dig at Quarr will be in the next Proceedings. This will complement a hardback book 'Monastic Isle of Wight' that will follow the forthcoming volume on 'Roman Wight'.

Paul Bingham and Anne Marston
*Editors of the Proceedings*

# THE ISLE OF WIGHT CHURCH NOTES OF SIR STEPHEN GLYNNE

***John Margham***

Sir Stephen Glynne (1807-1874), a gentleman of independent means from Hawarden, Flintshire, spent a lifetime visiting and recording churches throughout Britain. A previous publication provided a transcription of an 'antiquarian journey' made by Sir Stephen to the Isle of Wight as a young man in 1825 (Margham 2019). Churches featured quite prominently in this account. The following is a complete transcription of all the entries in Sir Stephen's notebooks relating to Island churches in alphabetical order of place-name. His observations made in 1825 are repeated, with the addition of his notes from subsequent visits firstly at an unspecified date after 1825 but before 1840, then in 1840, 1844, 1852 and lastly in 1863. His notebooks after 1825 consist only of information about churches. The volume and page numbers at the beginning of each account are taken from the catalogue of his notebooks prepared by Clwyd Record Office in 1977. Sir Stephen used the terminology developed by Thomas Rickman in his *An Attempt to Discriminate the Styles of English Architecture, from the Conquest to the Reformation* published in 1817, for example the division of Gothic architecture into E.E. (Early English), Decorated and Perpendicular. Glynne's notes were often written in a hurry and are thus sometimes difficult to read. As with the transcription of the 1825 visit (?) indicates uncertainty about a word, and square brackets [ ] indicate illegible words. Very occasionally Sir Stephen produced small sketches of features but generally his church records were almost entirely in the form of notes. Each church described is illustrated wherever possible from a source dating to before Glynne's visits, *A Journey to the Isle of Wight* by Charles Tomkins, published in 1796. Illustrations from other sources are used to illustrate the remaining churches. Comments are provided on Glynne's observations where appropriate and brief descriptions of architectural changes after the date of his visit are given.

**Arreton** in the Isle of Wight
[before 1840; vol 29, pp. 63-64]

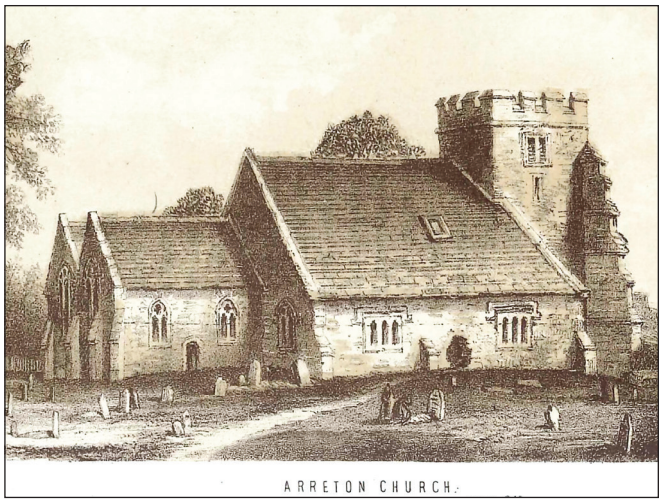


**Fig. 1:** Arreton unknown artist and date.

*This church has considerable portions of fine Early English and Decorated work and consists of a western tower, a nave with side aisles and a chancel with a south aisle. The tower is plain and rather low and appears to be Perpendicular. The south porch is vaulted in stone and most of the windows in the aisles of the nave are square headed and Perpendicular. The nave is divided from each aisle by 3 Early English arches upon circular columns, the capitals of which are varied, some round and some square. There is an arched aperture in the pier to the south of the chancel arch. There are 3 beautifully moulded Early English arches between the chancel and its south aisle, the piers are circular, very light and elegant, with moulded capitals. On the north side of the chancel are 2 fine Decorated windows with geometrical tracery and the south chapel has 3 of similar character, all enriched with shafts and the [ ] upon corbels. The two east windows are of earlier(?) and plain in character of 3 lights with circles in the heads and shafts in the interior. In the north wall of the chancel is a square [ ] or almonry. The chancel arch springs from clustered shafts. The south chancel contains a brass of a knight with this inscription Here is buried under this grave Harry Hawkes his soule God gave. Longtime Steward of the Isle of Wight. Have mercy on him God ful of might. In this church is a copy of Fox's Martyrs. At the west end of the south aisle are modern monuments to the family of Worsley Holmes [ ] to the late Sir Leonard Holmes (obit. 1825) with a gaudy effect of bright modern stained glass. There is a good organ in this church. In the churchyard is the tomb of the Dairyman's daughter who died in 1801. Near the church is a picturesque old house with gables.*

We would now describe the north arcade of Arreton's nave as Romanesque or Transitional Norman rather than Early English. Arreton remains much as recorded by Sir Stephen. A restoration of 1863 mainly affected the chancel, and that of 1886 resulted in the removal of the plaster ceiling of the nave and replacement of furnishings (Lloyd and Pevsner 2006, 75).

[**Binstead** 1825; vol 59, pp. 45-46]

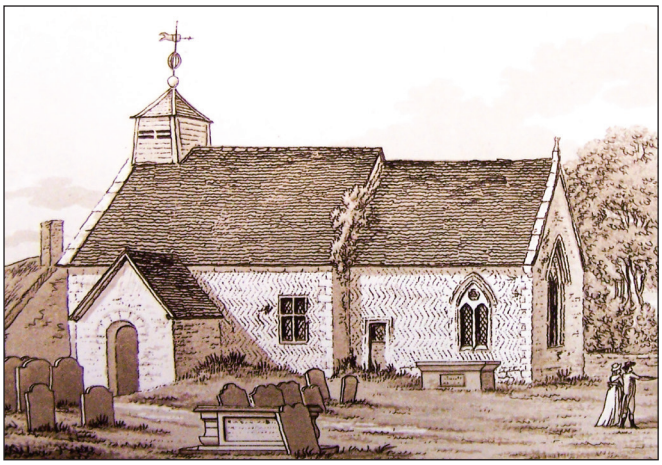

**Fig. 2:** Binstead Tomkins 1796.

*From thence to Binstead a very pretty neat village interspursed with trees and containing some very*

*beautiful cottages. Its church is small but very neat, consisting only of a nave and chancel. The south doorway is of plain Norman work. The arch which divides the nave from the chancel springs from brackets having the billet moulding. In the nave there are some plain lancet windows – in the chancel they are in a style between EE and Decorated – those in the north and south side of 2 lights, with trefoil in a circle between them, the whole being under a pointed arch with a dripstone. The east window is in the same style but is of 3 lights and has 3 circles with trefoils.*

The nave of Binstead church was rebuilt in 1845 by Thomas Hellyer (Lloyd and Pevsner 2006, 84) although the early Norman herringbone fabric of the original nave can be seen in the base of the south wall. This rebuilding involved the resetting of the former north doorway of the nave in the south wall of the churchyard. Two pieces of Romanesque stone sculpture were reset above the west windows of the nave and a third in the apex of the rebuilt south porch. The north arcade and aisle were constructed in 1875 and the western bellcote reconstructed in 1925 (*ibid.* 85).

[**Bonchurch** 1825; vol 59, p. 51]

**Fig. 3:** Bonchurch Tomkins 1796.

*The parish church is a very small and humble fabric, which at a little distance would not be taken for a church. It is very low and consists of a body and chancel without either tower, or steeple of any kind. It has some EE lancet windows, and others quite plain with round heads. The south doorway is semicircular and of rude Norman work. The whole has an air of rustic simplicity which is very pleasing.*

Bonchurch retains its character described by Sir Stephen. The 'new church' some 200 yards up the hill was built in 1847-8 (Lloyd and Pevsner 2006, 87). The 'old church' thus escaped Victorian 'restoration' but the neo-Norman chancel arch is the design of Percy Stone, dating from the 1920s. This replaced a plain round-headed arch (*ibid.* 88).

[**Brading** 1825; 59, pp. 47-49]

*The church is a good structure and one of the most spacious and handsome in the Island. It consists of a nave with side aisles, a chancel with side aisles, and a tower at the west end. The tower is supported upon 4 open pointed arches which form a kind of west porch. It has a belfry window of EE appearance and a plain parapet. It is surmounted by a short stone spire. The nave is divided from the side aisles by pointed arches with dripstones, and massive circular piers having*

**Fig. 4:** Brading Tomkins 1796.

*square capitals. The windows throughout the whole church are Perpendicular and mostly with square heads. The chancel is divided from its north aisle by 2 pointed [word missing] with architrave mouldings, and springing from an octagonal pier - from the south aisle it is divided by 2 wide arches without any curvature(?), springing from a pier of clustered columns in lozenge form. Within the altar rails a slab of stone is engraved a very fine figure of a knight in armour beneath a very rich canopy covered with figures of saints and ornamented in the Perpendicular style. It is in excellent preservation, and round it runs an inscription which is partly concealed by the altar rails ….Hic jacet nobilis dux … arming [ ] vivebat connestabularius castre de Porcester qui obit anno dom mille quadringe primus die ultima octobus meusil(?) amen. In the chapel north of the chancel are two fine altar tombs of Perpendicular work, much enriched with panelling and quatrefoils. In the south chapel are numerous monumental erections to the Oglanders, some of which are of good Perpendicular work, others of late Italian work. The church is very neatly pewed, and has a large organ at the west end. At the east gable is a good stone cusp(?). The church yard abounds with practical epitaphs, and among others is a beautiful one beginning "Forgive blest(?) shade" which has been finely set to music by Calicot.*

Brading church had two restorations in the second half of the nineteenth century. The present chancel arch was constructed either in 1864-6 or 1875-6. During the latter restoration by A.W. Blomfield the chancel was extended and lit by the triple-lancet east window (Lloyd and Pevsner 2006, 91).

[**Brighstone** 1825; vol 59, p. 60]

*The church at Brixton is a tolerably large and good structure, and kept in a state of great neatness. The church consists of a nave, chancel, south aisle and tower at the west end of the nave. The tower is very plain having a battlement and string course of Perpendicular character, a square turret on the north side, and a short leaded spire. The church is divided from its aisle by pointed arches with octagonal piers. The chancel is divided from its aisle by pointed arches with piers of a lozenge form having a shaft at each angle. The windows are chiefly square headed, with labels and of tolerable Perpendicular tracery. But there is one very strange window at the east end of the south aisle, which may probably be a recent work or alteration. It consists of 5 lights, the three centred(?) of which are contained*

*within a pointed arch, but the two external ones are much shorter and not included under the arch. Over the whole is a large pointed arch, with slight curvature. The font is octagonal, on an octagonal pedestal and very plain. The south door is pointed and moulded with plain dripstone. The north door has E.E. shafts. There is here on the north side of the tower the shed before mentioned. The tower contains 5 bells.*

**Fig. 5:** Brighstone Tomkins 1796.

Unlike his observations at Niton, Sir Stephen did not mention the blocked late twelfth century northern arcade of the church. This can be seen clearly in the illustration by Tomkins. This was opened up when northern aisle was rebuilt in 1852 under the direction of the rector, Reverend Edward McAll. He was also responsible for the windows in the south aisle and the windows in the north wall of the chancel and probably for those in the south chapel (Lloyd and Pevsner 2006, 98). The 'shed' mentioned by Glynne in 1825 can be seen in the Tomkins illustration of 1796 attached to the north side of the tower. This would have been for the storage of the parish gun.

[**Brook** 1825; vol 59, p. 62]

**Fig. 6:** Brook Tompkins 1796.

*About a mile beyond is Brook church, a small but very neat edifice, the greater part of which has been entirely newly done up and almost rebuilt in a very neat although not entirely correct manner. The church is prettily situated on a small eminence and is a small structure consisting of a single aisle with a chapel on the north side, and a low embattled tower on the south side which forms a porch. The whole church is wainscoted within, and the ceiling panelled and neatly painted. The windows are of a bad modern side. The chapel on the north is the burial place of the Bowerman family.*

Brook church was rebuilt in 1864 by Willoughby Mullins, after a fire in 1862. The south porch-tower which largely dated from c. 1730 was however retained but was reconstructed in 1889 by Mullins (Lloyd and Pevsner 2006, 99-100).

**Calbourne** Sept 1844 [vol 28, pp. 55-56]

**Fig. 7:** Calbourne Tomkins 1796.

*This church has a nave with a S. aisle, a N. transeptual chapel and a chancel – a small tower occupying the W. end of the south aisle. Some parts have been rebuilt or much restored. The tower is extremely small and mean and surmounted by a diminuitive shingles spire. The porch is modern but within it is a Norman doorway. The roofs are tiled – the material of the church is chiefly hard and gritty sandstone. The aisle does not reach quite to the west end of the nave and is divided from it by 3 Early English arches with very slight circular pillars having moulded capitals. In the aisle are 2 lancets, with a quatrefoil arch above – the whole included in a general(?) pointed arch. The west window is a lancet and there is also one on the N. side. The N. transept is wholly modern and is a tolerable specimen of an [ ] of the transitional character from EE to Decd – perhaps rather too ambitious in its ornaments. The chancel arch is wide and pointed – the mouldings springing straight from the wall. There is an ascent of 2 steps to the chancel. The chancel has 4 lancets on each side and a small priests door on the S. of flattened trefoil form. The east window has 2 lights and much resembles that of the east of the S. aisle – there being no including arch externally. The chancel has an open roof of plain kind and on the S the westernmost window is carried [ ] as if [ ]. That of the nave appears modern. There are ugly altar rails and the chancel is pewed. In the wall of the chancel is a brass plate inscribed 'Blest is the just man's memory both here and to eternity. In memory of the reverend religious and learned preacher Daniel [ ] 1613. There are figures of death and time – also a brass to Arthur Price, Rector – 1638. In the south aisle is a very fine and apparently early brass representing a knight with a dog at his feet – in plate armour and pointed helmet – probably of the 14th century. The font has a plain octagonal bowl on a circular stone with a square base. There is a barrel organ. The Holy Communion is administered monthly.*

It is a pity that Sir Stephen Glynne did not visit and record Calbourne church a few years previous to 1844 as this would have provided us with a record of the church before 'a vigorous restoration in 1838-42' by A.F. Livesay (Lloyd and Pevsner 2006, 102). This led to the loss of two round-headed hood-moulded doorways of Anglo-Saxon or Norman date. One of these can be seen in Tomkins' illustration of 1796. This was located in the north wall of the north transept which was rebuilt as the 'Simeon Chapel' by Livesay. The other doorway was set in the south wall of the south 'Westover' aisle, which was refaced externally (Butterworth no date). This doorway was illustrated by Englefield in 1802 (reproduced in Stone 1891, II, 14). The Norman doorway referred to within the porch would appear to be by Livesay and thus quite modern when after Sir Stephen's visit, with the chancel arch being restored by W.T. Stratton in 1873 and the interior of Livesay's north chapel largely destroyed through alterations of c. 1970 (*ibid.*).

[**Carisbrooke** 1825; vol 59, pp. 43-45]

**Fig. 8:** Carisbrooke St Mary Tomkins 1796.

*The church is the mother church of Newport, and is a good structure although much curtailed of its former dimensions, the chancel being entirely destroyed. It now consists of a nave, south aisle, and a tower at the west end. The tower is a very beautiful composition of Perpendicular work, being lofty and having a noble appearance when seen from a little distance. It is divided into several stages by string courses enriched with heads and other ornaments – has an octagonal turret at the south west corner, a good battlement and eight crocketed pinnacles rising from small turrets which spring from the string course below the belfry windows. The south door is a fine EE one with shafts. The nave is divided from the south aisle by pointed arches springing from massive cylindrical Norman piers having rounded capitals. All the windows in the church are Perpendicular and there are some good ones with square heads on the south side. In the north wall is a very good Perpendicular tomb to Lady Wadham wife to Sir Nicholas Wadham, who was captain of the Island in the time of Henry 7 – it is an altar tomb, under a Tudor arch richly feathered – having panelled sides – and the whole very much enriched in the style of that period. Near the east end is a stone with an ornamental cross upon it – which probably commemorated one of the Priors. Suspended to one of the pillars is a wooden tablet commemorating William Kieling groom to the chamber of James 1st. In the west gallery of the church is an organ.*

Carisbrooke church was not subject to any significant restoration work after Sir Stephen's visit in 1825, although the sanctuary was remodelled in 1967 (Lloyd and Pevsner 2006, 114). The chancel had been demolished, the chancel arch walled up and an east window within this wall provided in about 1565, long before Sir Stephen's visit (*ibid.* 113).

[**Chale** 1825; vol 59, pp. 55-57]

**Fig. 9:** Chale Tomkins 1796.

*Having walked some way along the downs we came in sight of Chale church, to which we hastened and examined. It stands in a bleak position, there being but two trees around it, and not many houses. The church consists of a nave, chancel, south aisle, and tower at the west end of the nave – the tower is of Perpendicular work – is embattled and crowned with 4 crocketed pinnacles, and has a staircase turret at the N.E. corner. It has a good string course, and at the west end a very good Perpendicular window – and doorway with deep mouldings, with a dripstone returned and continued round the buttress. Round the base of the tower is a very good band of panels and quatrefoils. The tower is open to the nave by a pointed arch. The nave is divided from the south aisle by pointed arches springing from circular pillars with square capitals. One of the pointed arches has architrave mouldings, the other is quite plain – the western arch is low and segmental. The chancel is divided from the south aisle by a plain semicircular arch. The door which then opened into the rood loft may be seen between the nave and chancel. There are several Perpendicular windows with square heads. The east window of the nave seems very early Decd – it is of 3 lights within one pointed arch – the lights have trefoil heads and between their heads are trefoils. At the west end of the south aisle is a plain window with a trefoil head. The font is attached to the western pier of the nave – it is octagonal and entirely plain.*

The chancel was lengthened to align it with the formerly projecting south chapel and the present chancel arch was constructed in 1872. The west window of the tower dates from the nineteenth century (Lloyd and Pevsner 2006, 116). Was this the 'very good Perpendicular window' commented on by Glynne?

[**Cowes** 1825; vol 59, pp. 41-42]

*West Cowes has a chapel which we attended today being Sunday. It is a very inelegant and unsightly structure built in a very bad style in a depraved period – the 17th century. The interior is totally commodious*

*and has galleries but there is nothing at all appealing to elegance or in any way remarkable. It has a small organ, not sufficiently powerful for the church.*

The structure of St Mary's of which Sir Stephen disapproved was built in 1657. The west tower was added in 1816, so had been constructed by the time of his visit in 1825. This tower was retained when the church was rebuilt in 1867 (Lloyd and Pevsner 2006, 120).


**Fig. 10:** Cowes John Hassell 1815.

**Freshwater** Sept 1844 [vol 28, pp. 57-59]

*This church is rather an interesting structure, and comprises a nave and chancel, each with side aisles, north and south porches and a western tower. It's of mixed styles- the tower is rude and singular in its character and engaged with the west end of the aisles. It [ ] somewhat of a castellated character the battlemented parapet is course and [ ] at the angles are small pinnacles and in the parapet, below the battlements, 3 small slits. On the west face is a small narrow slit in the belfry storey and 2 still smaller apertures under it beneath which is a horizontal course of billet corbels. On this [ ] is an open pointed arch in the west wall [ ] is a plain doorway. The western terminations of the aisle [ ] side of the tower have no windows and seem always to have been excluded from the rest of the church – they are now used as [ ] and rubbish place. The south porch is plain with an acute gable and within it a pointed door. The north porch is very small. The walls are of rough stone and there is one tiled roof over the nave and its aisles. The chancel aisles have separate tiled roofs and [ ] those of nave. The nave is loftier than the chancel and the east view is pretty well broken by gables. The tower is of unusually small dimensions and opens to the nave by a rude pointed arch and contains 2 bells. The nave is divided from each aisle by 4 obtusely pointed E.E. arches opening from large circular columns having square abici and round moulded capitals but on the north side the westerly division is formed by only 3 parts of an arch against the tower face. The chancel arch is pointed and wide – springing straight from the wall without shafts. The chancel is divided from its aisles by EE pointed arches, springing from circular columns with square chamfered capitals. Some of the windows in the aisles are square headed of late date – others modern and bad. There is a small window in the south aisle over the arch dividing it from the south aisle of the chancel. The chancel has a bad east window of 3 lights without [ ]. In the north aisle of the chancel the windows now [ ] seem to have been Decorated. There is the rood door remaining on the north side of the chancel arch. The south chapel of the chancel has been undergoing restoration, but its windows in 1844 were bad wooden ones. In this chapel is a very fine Early English arched [ ] in the wall, probably for a tomb, and having much of [ ] and elaborate detail. The [ ] has a fine hollow moulding with toothed ornament and corbel heads.*

**Fig. 11:** Freshwater Tomkins 1796.

*The imposts are charged with lozenge work and the feathering(?) of the [ ] very bold and remarkable – the centre arch of the [ ] is cinquefoiled, but not the others – at the points are pieces of foliage and in the spandrels quatrefoil circles of open work. In the same chapel are [ ] of several brasses one with 2 figures under canopies and a [ ] between the canopies. The altar has a stone slab and the [ ]. The font has a large octagonal bowl, upon a large block in the centre having four shafts, without capitals, attached to its angles, the whole on a square plinth.*

*The Holy Communion is administered monthly.*

The footprint of Freshwater church was significantly enlarged with the restoration by W.T. Stratton in 1875-6. The aisles were rebuilt extending them both outwards, and the chancel was extended eastwards. The chancel arch dates from this restoration, as does the organ chamber. The thirteenth century eastern window of the chancel south wall was reset from the north side where the organ chamber was inserted. The aisle windows are Stratton's but were inspired by those of the chancel. The twelfth century north doorway to the north aisle was moved there by Stratton from the former south aisle, where it opened into the south chapel (Lloyd and Pevsner 2006, 138-40). The font in its present form dates from 1894 by F.L. Pearson but incorporates the rather worn top of its base and possibly the central stem from the Romanesque font.

**Gatcombe S Olave** Nov 16 1852 [vol 26, p. 31]

*A small church with chancel and nave, without aisles, and a western tower, mostly perp. The tower is a good one of sandstone, of a character like Carisbrooke- it is embattled, and has 8 crocketed pinnacles set on the string course and divided below the parapet by 2 stings into 3 stages. The belfry windows square headed, of 2 lights with stone open lattice work. The W. window of 3 lights, and below it a labelled Tudor doorway. There is a square turret of large size on the N. projecting as far*

*as the N. wall of the nave, divided by strings slighted by apertures. The string course under the battlement has a hollow band with heads of [ ]. The stone masonry is excellent. There is one lancet window on the south- the other windows fair Perp. Of 2 lights. One contains tolerable fragments of stained glass. The chancel arch is pointed, upon octagonal shafts which rest on large square bases. The E. window is of 3 lights square and debased. In the N wall of the chancel is an obtuse arch with mouldings, apparently Early English, beneath which is a fine cross-legged effigy in good preservation. The font has an octagonal bowl, each face charged with 2 obtuse arches in panelling of doubtful age. The [ ] plain. The rest of the nave tiled. The churchyard sequestered and shady.*

The chancel at Gatcombe was rebuilt in 1864-5 by R.J. Jones. The church was restored from c.1920 by W.D. Caröe who added the organ chamber and vestry to the north side of the chancel. He also designed the vault in the tower. The windows by William Morris, Ford Maddox Brown, Philip Webb, and Edward Burne-Jones all post-date the visit by Glynne in 1852 (Lloyd and Pevsner 2006, 148-9).

**Fig. 12:** Gatcombe Tomkins 1796.

***Godshill*** [undated and not indexed]

*This church is cruciform, tolerably spacious and finely situated upon a lofty eminence. The nave and chancel have a south aisle only, and the tower is at the west end – the latter built of good grey stone, of Perpendicular character with a battlement and 8 crocketed pinnacles and square headed belfry windows filled with lattice work. The W window however is Decd of 2 lights. The windows of the nave are much altered. In the S transept is one with Perpendicular tracery and above it in the gable is a projecting arched aperture of singular character with corbel heads. The interior presents two wide equal aisles without a distinction of chancel divide by 6 pointed arches rising from octagonal pillars – the most eastern arch has fine mouldings. The tower arch is well formed without shafts. The transepts open also to the aisles by pointed arches. The roofs of both aisles are high covered, the arrangement of the beams are very good. The windows of the chancel are Decorated – the 2 eastern of 3 lights – the others chiefly of 2 lights [ ] tracery. In the S. transept is a heavy monument in form of a sarcophagus to Sir R. Worsley. In the northern – several others of somewhat similar character to the same family. The last pier next to the east is occupied*


**Fig. 13:** Godshill unknown artist and date.

*by a very fine tomb of Perpendicular character to some of the Hackett family – the sides panelled and on it 2 recumbent effigies of a knight and lady in alabaster – the female figure exquisitely sculpted with angels at her head – above a canopy in the form of a contracted arch with fine tracery and hanging feathering(?) and over it a rich panelled band with half figures of angels bearing shields. The interior is very neat and there is a fine organ. The font is a plain octagon.*

No significant structural changes have been made to Godshill church since Sir Stephen's visit there.

**Kingston**, in Isle of Wight *May 29 1863* [vol 26, p. 66]

*A small church in a pretty situation, on an eminence with no house near to it save one of those picturesque Jacobean stone manors so common in the island and now a farmhouse and shaded by some trees. The plan is merely nave and chancel undivided, with a bellcote over the W. end. The latter is rather good, with pointed top and with one open [ ] having an E.E. character. There is a S. porch and what appears rather ridiculous another S door in addition to the porch. The W window has been mutilated – there are 2 bold buttresses flanking it. There are 2 bad [ ] windows on the S – and one lancet next to the E. On the N. a single obtuse headed window and a bad modern one. The E. window is a double lancet lately restored and filled with stained glass. The roofs are covered with flags. The interior is [ ] - the font a plain octagonal bowl diminishing downwards. Against the N. wall is set a brass(?) with effigies of Sir Richard Mew and his 3 sons AD 1535.*

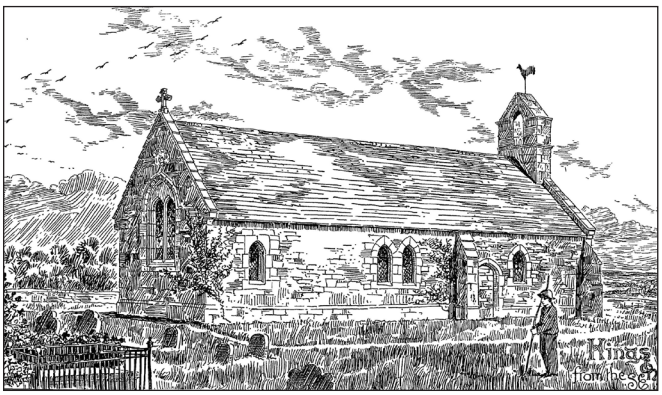

**Fig. 14:** Kingston from the south-east Stone 1891 vol 2 plate 89.

Kingston was restored in 1872 by R.J. Jones. He added the south porch and the vestry to its east and renewed several windows in the Early English style. The south

arcade of two bays opening into the vestry is also by Jones whereas the western bell-cote appears to date from the early nineteenth century (Lloyd and Pevsner 2006, 159).

[**Mottistone** 1825; vol 59, p. 61]

**Fig. 15:** Mottistone Tomkins 1796.

*The next village was Mottistone about 2 miles distant. This contains a small church of mean external appearance but not within. It consists of a nave, with narrow north and south aisles, a chancel, a plain south porch, and a tower of very rude workmanship at the west end, and surmounted by a heavy wooden spire of no graceful appearance. The tower is of rough stone, and has a plain belfry window. On the north side is a shed. The interior is neat although plain and humble. The nave is divided from each aisle by pointed arches with octagonal piers having square bases. The chancel has a north aisle from which it is divided by obtuse Tudor arches with lozenge piers having shafts and capitals of octagonal form. These appear to be Perpendicular. The east window of the chancel is good Perpendicular having a dripstone with squares at its extremities containing roses and shields. The rest of the windows in the church have square heads, with labels and are mostly of two lights. The font is a large square, with round shafts at the angles. In the steeple is only one bell. It may be observed that all of the churches we saw in the Isle of Wight not one had a clerestory. This church is somewhat damp within.*

The church was restored by Willoughby Mullins in 1863. This included the addition of a battlemented parapet and short spire to the church tower. This replaced a broach spire. Mullins also restored the square-headed side windows of the aisles and renewed the three-light east window of the chancel. The furnishings are largely also of 1863 (Lloyd and Pevsner 2006, 163-4). The font would appear to have been modified in the late nineteenth or early twentieth century which included the addition of an inscription.

**Newchurch All Saints** [1840; vol 29, pp. 66-67]

*This church is situated within a spacious churchyard and commands a pleasing view of the valley. It consists of a nave with aisles and a chancel and north and south transeptual chapels and a low tower forming a porch on the south side and surmounted by a mean spire of wood. The aisles are narrow and low and the tiled roof descends quite low over them. There is a lancet window at the west end of one of the aisles. Some other windows are modern and on the south there are double lancets with trefoil heads under an arch but the windows of the nave are few and thinly scattered. There are 4 pointed arches upon each side – the last opening to the transepts have mouldings carried all down the piers without capitals – the others have octagonal pillars without capitals. The south transept is of good stone and fine masonry but late Perpendicular – the north transept is of poor debased work and has monuments to the Dillington family. There is a small aperture in the pier between the S aisle and transept. The chancel arch is Early English and on the north side of the chancel are 3 lancet windows, which internally have dripstone and string course. Other windows of the chancel are Perpendicular. The font is a small square basin cased in wood and lined with lead upon a circular shaft surrounded by 4 smaller shafts. The walls of the church are mostly rough and rude.*

The church was restored in 1883 by A.R. Barker (Lloyd and Pevsner 2006, 168). This would appear not to have had much of an effect on the fabric recorded by Glynne.


**Fig. 16:** Newchurch John Hassell 1815.

[**Newport** 1825; vol 59, p. 42]

*Newport is the metropolis of the Island and is very neat handsome town having several good buildings. The church however has no pretentions to beauty. It is rather a low building consisting of a nave with side aisles, a chancel with aisles and a tower at the west end. The exterior is very ugly, both from the rough appearance of the stone, and the reputed(?) injudicious alterations which it has undergone – scarcely one window*

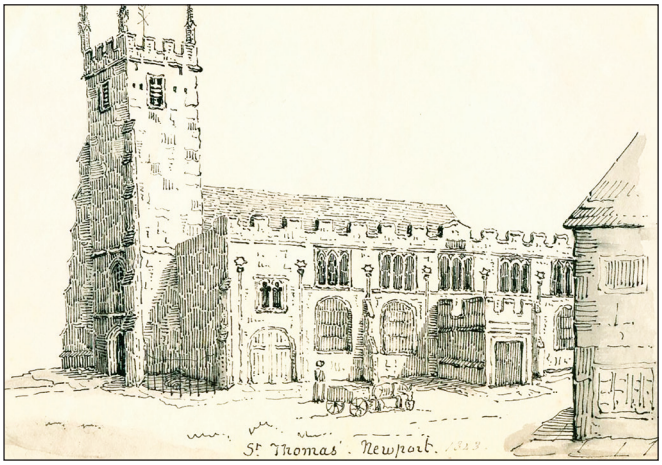


**Fig. 17:** Newport St Thomas possibly 1843, unknown artist.

*throughout the church has not been cruelly mutilated and deprived of its tracery. The interior is very gloomy – the nave is divided from the side aisles by low arches obtusely pointed and very plain in their mouldings – the piers are Norman – being circular and massive with round capitals – there is one arch on the south side of very singular form – being a very obtuse ellipse. Over some of the arches in the nave are plain EE windows or openings with sloped sides. The chancel is divided from the aisles by pointed arches much sharper than those of the nave and having octagonal piers. The pulpit in this church is a most beautiful work being most intricately(?) wrought with carving of about the 17th century and is the only beautiful thing about the church. It is very full of pews and galleries and has a good organ.*

The building visited by Sir Stephen Glynne was essentially a late twelfth century structure, a substantial chapel of ease within Carisbrooke parish for the townspeople of Newport. This church was demolished in 1854-6 when the present neo-gothic building was constructed on the same site to a design by S.W. Daukes (Lloyd and Pevsner 2006, 173).

[**Niton** 1825; vol 59, pp. 57-59]

**Fig. 18:** Niton Tomkins 1796.

*Setting off at an early hour we passed first through the village of Niton a mile distant. The church of the village consists of a nave with south aisle, a chancel, and tower at the west end. It had formerly a north aisle, as may be seen by the arches on the north aisle walled up. The tower is plain and has a door like that of Chale, and is surmounted by a short stone spire ribbed at the angles. The nave is divided from the south aisle by 3 wide plain obtusely pointed arches with massive round piers having round capitals. The piers of the north aisle had square capitals. There is no clerestory and the windows are mostly perpendicular with square heads and labels. The door to the rood loft remains. The chancel is divided from its aisle by a wide pointed arch. The font is circular with a rope moulding round the top – it is attached to a pillar as that at Chale. The south porch is within arched with stone. The east window of the chancel is of 3 lights within one pointed arch.*

Niton church was restored in 1864 by R.J. Jones who was responsible for the east window of the chancel. Jones had the north arcade of the nave unblocked and the present north aisle constructed with its lancet windows (Lloyd and Pevsner 2006, 192).

**Northwood I of Wight S John**
17 Nov 1852 [vol 26, p. 30]

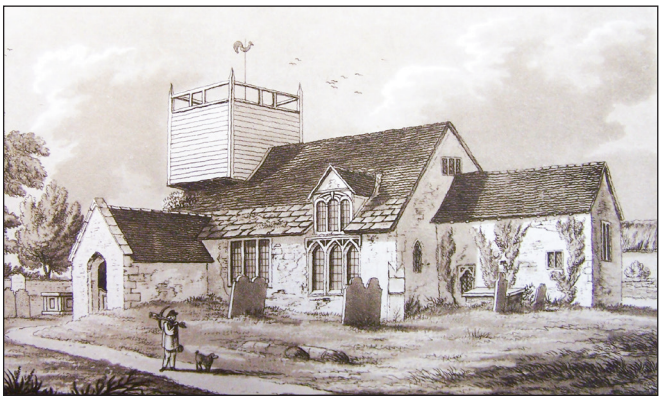

**Fig. 19:** Northwood Tomkins 1796.

*This church has a nave with narrow aisles and chancel. Over the W. end a battlement with slated spire. Within the S. porch is a good Norman doorway with 2 orders of moulding, the star and the double chain, and one order of shafts with square abici. The arcade of the nave is of 4 bays- plain Early English arches, with circular columns having square caps with angles cut off. The chancel arch is a very plain finished(?) one, springing from the walls. Most of the windows are wretched modern insertions, but some are late square headed. Those at the E end of the aisles are single cinquefoiled. The roof of the aisles a lean-to- the whole tiled rising high on the nave. The [ ] is mean(?) and encumbered with [ ]. The font has a plain octagonal bowl [ ] of like form. On the N of the chancel is a single obtuse headed lynch(?) [ ].*

The western tower and spire date from 1864 (Lloyd and Pevsner 2006, 197). The windows, 'wretched modern insertions', have been replaced. Internally, the church is much as Sir Stephen saw it in 1852.

[**St Lawrence** 1825; vol 59, p. 53]


**Fig. 20:** St Lawrence Old Church unknown artist 1851.

*But the principal feature of the village is its singularly diminutive church, which is far too small for the population of the parish, although that is not great. The church only measures 20 feet in length and 12 in breadth and height proportionate. It seems strange that any one should ever have built an edifice of such ridiculous dimensions for a parish church. It consists of a single aisle with an arched turret at the west end containing a bell. The windows are mostly small lancets. The eastern one is filled with painted glass. South of the altar is a plain pointed niche. The font is not in proportion to the*

*church being of large size – of square form on a square pedestal. This little church is kept in an extremely neat condition and the exterior has some ivy which gives a pleasing appearance.*

Sir Stephen says that the church consisted of 'a single aisle'. By this he meant the nave. The 'old church' at St Lawrence is, or rather was, one of the smallest churches in England when visited by Glynne. The chancel was added in 1842. The church was restored by Percy Stone in 1926-7. The 'new church' 200 yards away was built in 1878 to a design by Sir George Gilbert Scott (Lloyd and Pevsner 2006, 248-9).

**Shalfleet** Sept 1844 [vol 28, p. 53-54]

**Fig. 21:** Shalfleet Tomkins 1796.

*This church has a nave with a large south aisle – chancel – N and S porches and west tower. The latter is of extremely unusually large dimensions (but low) presenting a remarkable appearance and having walls 6 feet thick. Its character is Early English just emerging from Norman and it is divided into 2 stories by a string of Norman billets. The buttresses are flat faced the belfry windows have double lancets within a pointed arch, but are mostly(?) closed. There are trefoil lancets on the N and S sides- no west door a west window of late date. On the W. two later buttresses are added. The parapet is embattled – then on the tower rises a short [ ] spire. The material is a course but hard grey stone. The tower arch to the nave is pointed, the inner member upon shafts. Within the north porch is a fine Norman doorway having 3 courses of moulding – two rising from shafts with cushion capitals – the 3rd upon an impost moulding. In the head of the arch, above the door, is some rude sculpture in stone representing a human figure between 2 animals – the hands on the head of each and rough foliage around. There are separate tiled roofs to the nave and the aisle, each of which is very wide. The S porch is small and low. On the N. side of the nave are modern windows of 3 lights. In the S. aisle are some good windows of 3 lights of EE character ranging to Decd – consisting of 3 unusual lancets with 3 circles above included within a pointed arch having hood mouldings within and without. The east window of this aisle is of rather different character and has on the mullions shafts [ ] moulded capitals and the hood is on EE corbels. The nave is divided from the aisle by 4 [ ] EE arches springing from very light columns of Purbeck marble having moulded capitals and bases, but unfortunately whitewashed. Under the east window of this aisle is a monumental stone in the wall of dubious character date 1620. The roof has tie beams and king posts. At the W of the S aisle is a small double lancet set up(?) high in the wall. The chancel arch is wide, of pointed form, on circular EE shafts with moulded capitals. The chancel is large, of good very early Decd style, but has been much spoiled by some modern restoration. It has on each side 3 windows of 2 lights with shafts on the mullions and at the E end one of 3 lights, which has modern tracery. The stained glass which formerly filled these windows has been most improperly removed. On the S side of the altar is a piscina with trefoil arch – and trace of a sedilia now destroyed by the insertion of a window. In the chancel is a monumental slab now broken in 2 pieces showing figures(?) of a shield and a spear. The chancel arch facing eastwards is rather curious, formed(?) from the form of the hood moulding. There is a big barrel organ in a western gallery. The entrance to the N. porch is by an obtuse arch on polygonal imposts.*

A low broad spire had been added to the tower c. 1800 but was removed c. 1910. The interior of the church was scraped of its plaster in 1889 revealing the rough stonework (Lloyd and Pevsner 2006, 260-1). Glynne said of the tower 'Its character is Early English just emerging from Norman…'. This opinion was presumably based on the presence of a two light lancet window in the east face of the tower above the nave roof line. This is likely to have been an insertion into the tower, perhaps in association with the provision of a bell or bells. The tower, which was free-standing when first built, can be dated to the late eleventh or early twelfth century.

[**Shanklin** 1825; vol 59, p. 50]

*The church of the delightful village is a humble and unassuming structure of small dimensions, consisting only of a nave and chancel with a small wooden turret at the west end. The windows are mostly plain lancets with trefoil heads – others have square heads and the eastern one is Perpendicular.*

**Shanklin S John Baptist or S Blaise**
31 May 1863 [vol 26, p. 67]

**Fig. 22:** Shanklin Tomkins 1796.

*Originally a small church with undivided chancel and nave much resembling Kingston, but now much changed and enlarged by the addition of a large sprawling transept equal in size to the other parts of the cross(?), an awkwardly conceived plan and causing great confusion. In the centre has been erected a singled belfry and small spire. The chief remaining original features are seen in the chancel, which is swamped by the large clumsy transepts. There are original EE single lancets*

*N and S of the chancel with trefoil heads, also an ogee sedilia and piscina with trefoiled arch and stone shelf. The priest's door also remains on the S. The E window is now Dec and of 3 lights. The nave has been lengthened and extended on the S so as to form an organ chamber – but a trefoil headed original lancet still remains on the N, and a square headed Perp. one is retained on the S. The font has an octagonal bowl painted(?) with quatrefoiled circles. The interior is confused and the new windows are of ordinary Perp. character.*

Shanklin is unique amongst Island churches, having been recorded twice by Glynne. The visit in 1825 provided a brief description of the church before the drastic building work of the mid-nineteenth century, with the notes made in 1863 compiled after the changes. The north transept was added in 1853. In 1859 the south transept was built, along with the short south aisle, the extension of the nave to the west, and the construction of the central turret (Lloyd and Pevsner 2006, 263).

[**Shorwell** 1825; vol 59, pp. 59-60]

**Fig. 23:** Shorwell Tomkins 1796.

*Shorwell church (St Peter) is one of the neatest and best in the Island. It consists of a nave and chancel with side aisles, and a tower at the west end crowned with a stone spire which though not very lofty is the highest in the Island. The tower is Perpendicular and has a square staircase turret on the north side, which seems common to all the churches of the Isle of Wight. The west window in the tower has somewhat of Decorated character and the belfry windows have plain stone lattice work. The south doorway is pointed and has EE shafts with a dripstone moulded with the toothed ornament. The windows of the whole church have an appearance of Decd work. The nave is divided from its north and south aisles by pointed arches springing from octagonal pillars – in the chancel the pillars are circular but have octagonal capitals. The pulpit is of stone, and good Perpendicular work, being ornamented with panelling and tracery. The font is octagonal and attached to one of the piers on the south side of the nave, as those of Chale and Niton. On the cover is the following passage from scripture 'And the [ ] Holy Ghost descended in a bodily shape like a dove upon him' Luke 9.1.22. In the chancel is a good brass to Sir Richard Bethell formerly vicar of this church. The inscription runs thus and in black letters – 'of [ ] charity pray for the soule of Sir Richard Bethell late vicar of this churche of Shorwell [ ] whiche decesed the XXIIII day of marche the yer of our lord MDXVIII on whose soule [ ] have mercy'. In a chapel at the east end of the north aisle are several gorgeous Italian monuments to the Leighs mostly of the age of Elizabeth. There are also some modern monuments in the south aisle of the chancel. The tower has a good stone groined roof open to the lower storey and contains 3 bells. On the north side of the tower is a kind of shed which is common to most of the churches in the Isle of Wight and in many cases appears to be of no recent date.*

The stonework of the two-light west windows to the tower and the aisles was accurately renewed in the 1990s (Lloyd and Pevsner 2006, 271).

**Thorley** Sept 1844 [vol 28, p. 56]

**Fig. 24:** Thorley Tomkins 1796.

*A small mean church – consisting only of a nave and chancel with south porch – over which a bell is hung in a kind of wooden cage. There is no good work – apparently no antiquity, although the material is a good stone. The roof is tiled – the west window of 2 lights – pseudo Decd and beneath it a door. The northern window square headed. The chancel arch is pointed but rather obtusely – and is plain and inelegant. The east window has 2 plain lancets. The font has an octagonal bowl and stem of like form.*

This structure now consists only of the south porch and belfry above. The rest of the church was demolished in 1871 when the replacement church in Thorley Street was built by W.T. Stratton (Lloyd and Pevsner 2006, 281).

**Whippingham** [before 1840; vol 29, p. 64]

*This uninteresting church has a nave, transepts and chancel and western tower crowned with a wood spire. The whole save the chancel appears to be modern, or at least the original features are quite obliterated. The chancel arch is pointed and the chancel are [ ] lancet windows. There are many modern monuments and a barrel organ.*

**Fig. 25:** Whippingham Tomkins 1796.

This 'uninteresting' church has been replaced by the existing Gothic confection. The present chancel was built in 1854-5 and the remainder in 1860-2 (Lloyd and Pevsner 2006, 293). The church that Sir Stephen recorded was the alteration of a small building which would appear to have originated in the late eleventh or twelfth century (Tomkins illustration). This alteration was 'modern' when seen by Glynne, as these changes were made by John Nash in 1804-6. These included the extension of the nave westwards to form a school room and the provision of north and south transepts (Lloyd and Pevsner 2006, 293; Stone 1891, I, plate xxxiii).

**Whitwell (I of W) S. Radegund**
Nov 16 1852 [vol 26, pp. 32-33]

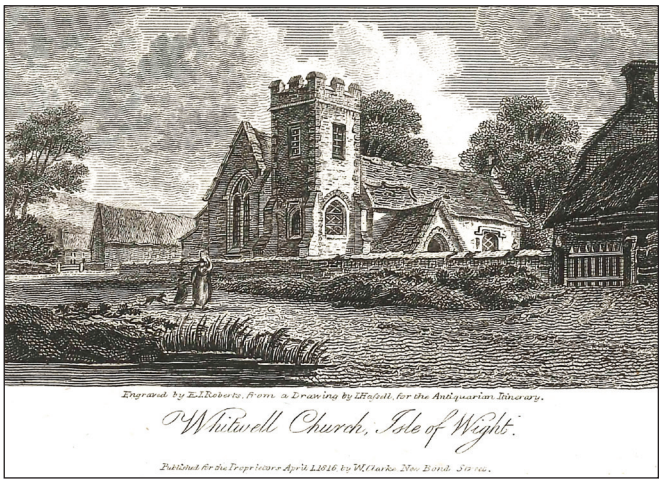


**Fig. 26:** Whitwell John Hassell 1816.

*This church has a chancel and nave, each with a south aisle, and a small engaged tower at the S.W. There is also a S. porch of this construction, entirely of stone, with arched ribbed roof. The tower opens internally by 2 plain pointed arches in the nave and the aisle, and beyond the tower is an irregular arcade reaching to the E end of 3 arches- [ ] 2 are in the nave and one in the chancel. The western arch is a plain pointed one of rather E.E. appearance- the column circular, with square capital, having the corners cut- the(?) arch is obtuse and elliptical in form- the eastern arch is also obtuse and irregularly formed – the 2 eastern piers octagonal. The altar is singularly placed at the E end of the south aisle, instead of in the chancel – inscribed AD 1632 I will take the cup of salvation [ ] with a cup sculpted(?). The windows of this aisle are late Perp, with flat arches, that of the E end has [ ] is of 2 lights, apparently altered. There is a chancel arch of pointed form, springing from one of the [ ] impost [ ] on the N. a Norman looking impost [ ] capital. There is a lancet window on the N. of the chancel. The E window Dec. of 2 lights. At the E. end is a piscina with shelf. The [ ] is very improperly lined(?) up. The windows of the nave are late Perp. The [ ] one has rather a crooked look. The font has been restored- the bowl octagonal chamfered against the W pier of the tower- and a [ ] cut in the pier. There are traces of colour on the wall. The pulpit is Jacobean, of respectable character. The tower is very small and low and seems Perp., embattled with a slit for(?) belfry window and no buttresses. On the W- a small labelled window.*

Whitwell church was restored by R.J. Jones in 1868. This work revealed the northern respond and springing of the Romanesque chancel arch, which had been incorporated into the reconstruction of the arch in the early sixteenth century. The present form of the east window of the south chapel dates from 1868 and the north and west windows of the church were restored at this time (Lloyd and Pevsner 2006, 298-9).

**Wootton** [before 1840; vol 29, p. 65]

**Fig. 27:** Wootton Tomkins 1796.

*This is an extremely small church with only a nave and chancel and no steeple, but there is an arch on the north side which seems to have opened to a chapel now destroyed. The interior is very plain and there is no architectural distinction of chancel. The south doorway is a fine Norman specimen, with excellent chevron ornament in its mouldings and a dripstone with the billet ornament – the shafts have the abacus. In the chancel are some lancet windows – other widows appear to be Perpendicular and some have trefoil heads. The east window has 3 trefoil lights of unequal elevation, within one pointed arch.*

Wootton church today is largely as described by Sir Stephen with the following additions made in 1893: the Transitional Norman archway in the north side of the nave was opened up with the chapel beyond rebuilt, the organ chamber to the east of this chapel was added and the western bell-cote was constructed replacing a small wooden belfry (Lloyd and Pevsner 2006, 302).

[**Yarmouth** 1825; vol 59, pp. 65-66]

*The church has not much beauty either externally or internally. It consists of a nave with side aisles, a chancel, and a plain and very low tower at the west end, with an embattled parapet. The roof of the body is high, so that the west tower rises but a little above it. The nave is divided from the north and south aisles by high pointed arches springing from octagonal piers. The windows are mostly Perpendicular with square heads but there are some narrow ones with obtuse heads. In a small modern chapel built on the south aisle of the chancel is a sumptuous monument to Admiral Sir Robert Holmes who died in 1692. The figure is full length and well executed. The pulpit has a good carved sounding board, and an iron stand for an hour glass.*

**Fig. 28:** Yarmouth Tomkins 1784.

Yarmouth church is now more prominent as the tower was significantly heightened in 1831. The church was restored in 1873 and in 1889 the chancel was lengthened. At this time, the seventeenth century east window was repositioned. Despite Glynne's comments about the aesthetics of the church, it is an interesting 'Gothic Survival' building consecrated in 1626 (Lloyd and Pevsner 2006, 304).

**Yaverland** [before 1840; vol 29, pp. 65-66]

**Fig. 29:** Yaverland Sir John Gardner Wilkinson 1840s.

*This church is even smaller than the last mentioned* [Wootton]*, but has some fine Norman specimens- in the arch of the south doorway and in the chancel arch. The former is very singular the door itself is square headed but carried higher than the imposts and the stonework about it- the arch head is carved with lozenge work. The outer moulding of the arch has chevron ornament, the stone work within it is singularly worked- the shafts have plain capitals. The chancel arch is narrow, but has 2 fine courses of moulding upon the shafts which are varied in character. One course has very fine bold chevrons containing a kind of knob or point- the dripstone has also chevron on a smaller scale- the inner arch moulding is upon plain imposts. The walls of the church are of mixed flint stone. In the S wall are a few lancet windows walled up, and one double lancet with [a] circle between the heads. There are very few other architectural features. The interior is neat but very low and small. North of the chancel arch is the door that led to the rood loft. The font is a plain octagon. The church is shaded by fine trees and adjoining is a handsome ancient mansion of stone with picturesque gables apparently of the age of James I.*

Yaverland church was restored by Ewan Christian in 1887-8. The chancel was extended, the north aisle added along with the vestry and organ chamber, the western bell turret was reconstructed, and the timber framed south porch built to protect the nave doorway. In addition, most of the windows were renewed, a thirteenth century recess in the south wall of the nave was opened up, and the opening above the chancel arch inserted (Lloyd and Pevsner 2006, 310-12). The chancel arch remains the finest example of Romanesque architectural sculpture on the Isle of Wight.

## Sir Stephen Glynne and the Isle of Wight - an evaluation

Glynne was a pioneer of church recording: although unpublished in his lifetime, his notes can be compared with the work of Sir Nickolas Pevsner in writing *The Buildings of England* books in the mid-twentieth century. Glynne's notebooks give us good written accounts of the appearance of Island churches in the mid-nineteenth century. He recorded a total of 29 churches on the Isle of Wight. All of these were essentially medieval buildings, with the exceptions of Yarmouth and the chapel at Cowes, both substantially 'built in a depraved period - the 17th century'. He has provided descriptions of structures which have been demolished and, with the exception of Thorley, rebuilt: St Mary's Brook, St Mary's Cowes, St Thomas' Newport and St Mildred's Whippingham. Many of the churches he visited subsequently underwent 'restoration' of varying degrees, although St Lawrence and Bonchurch were saved from excessive restoration with the provision of 'new' churches. A comparison of his notes made in the two visits to Shanklin emphasise the drastic nature of the work undertaken there in the 1850s. Although transcriptions of his notes on Island churches have not produced any revelations about the Island's church architecture and archaeology, with the exception of Calbourne, Glynne has left us valuable written accounts of the fabric of churches before these nineteenth century church restorations. His accounts complement illustrations by various artists such as Tomkins.


## Acknowledgements

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# THE POPULATION OF THE ISLE OF WIGHT TO 1800

***John Margham***

**Abstract** *The area of southern Britain now known as the Isle of Wight first had a hominin population from c.425,000 before the coming of modern humans. After the most recent glaciation, it had a mobile population of hunter-gatherers. This was followed by the introduction of agriculture and a more settled population. Modern research has identified significant genetic changes of the human population in later prehistory. The Isle of Wight would appear to have been relatively prosperous in the Romano-British period. The nature of population change and composition is uncertain for the beginning of the early medieval period, but inferences can be made regarding the distribution of the population in the succeeding centuries. The Domesday survey provides a picture of the population distribution in the eleventh century. The medieval rise in population came to an end in the fourteenth century. In the seventeenth century, the population numbers were increasing significantly, a trend that continued to and beyond the end of the study period. The advent of detailed mapping provides a picture of the population distribution within the Isle of Wight in the late eighteenth century.*

## Introduction

There can be no certainty about the precise distribution of the human population of the Isle of Wight until the later seventeenth century with the hearth taxes, and accurate map-making only dates from the mid -eighteenth century. Anything approaching precise numbers for the Island's population was not available before the early seventeenth century, despite the apparent comprehensiveness of the Domesday survey of 1086 and the existence of various medieval taxation documents. The present paper seeks to investigate the broad trends of population dynamics and to assess the distribution of population in this era before the first official government census in 1801. Despite the lack of records or their often incomplete nature, inferences can be made from diverse sources. Archaeology, environmental history, historical documents and place-names can all provide some evidence, although the last two can only provide information in the post-Roman era.

## From the first inhabitants to *Vectis*

### *The First Inhabitants*

The area that we now call Wight did not become an island until the later Mesolithic or even during the early Neolithic (below) a few thousand years ago. The earliest hominin occupants of this region were probably present in about 425,000 BP [before present] (Hopson and Farrant 2015, 143). These would not have been modern humans, *Homo sapiens sapiens,* who did not arrive in Europe and Britain until about 40,000 BP (Hopson and Farrant 2015, 141). Indeed, all the limited evidence that we have for early human occupation in the area of the Wight predates the coming of modern man. Two examples are the Priory Bay site with its associated artefacts with a date range of 367,000 to 216,000 BP (Wenban-Smith *et al.* 2009), and deposits at Great Pan Farm, first recorded by Hubert Poole, which contained artefacts of Middle Palaeolithic character (Poole 1925; Roberts *et al.* 2006). There is, to date, no definite evidence for human occupation after this until the post-glacial period of a warming climate (Hopson and Farrant 2015, 143).

### *After the Ice - The Mesolithic (c. 10,000 to 4000 BC)*

The hunter-gatherers of the Mesolithic were unlikely to have had any permanent settlements, so a mobile population with seasonal settlements can be envisaged. Although hearths and artefacts have been found on the Island, many of these seasonally-occupied sites would have been located in areas now below sea level. One example of such a site is Bouldnor Cliff. Here, evidence of occupation dating to about 8,000 years ago has been located in a layer of peat now lying some 12.5 metres below modern mean sea level (Momber *et al,* 2011, 33). This sea level rise after the last glaciation led to the creation of Wight as an island, but the date of the final severance from the mainland is uncertain. One school of thought is that this event happened with the submergence of the Christchurch Bay area between 7500 and 5000 BC. An alternative is a date of later than 3500 BC (Hopson and Farrant 2015, 104). No reliable estimates can be made for the population of what is now the Isle of Wight in the Mesolithic apart from saying that occupation levels were low, reflecting the transient nature of settlement and extensive rather than intensive land use of an environment which was predominantly wooded by the end of the era.

### *The First Farmers (c. 4000 to c. 2200 BC)*

The introduction of farming has traditionally been associated with population change. There was a move away from this concept in academic circles some decades ago with emphasis on the diffusion of ideas. Recently, the study of ancient DNA has given support to the traditional interpretation that incomers were responsible for a significant cultural shift in about 4000 BC (Booth 2019). It has been found that the British Neolithic population had closer genetic similarities with the Neolithic inhabitants of Iberia than those who lived in central Europe. This suggests that the Neolithic people of Britain may have been descended from populations who moved westwards from the Aegean. Overall, the amount of DNA inherited by Neolithic people from British Mesolithic populations can be shown to be small (Booth 2019, 21), but with increasing amounts of Mesolithic DNA from the south-west to the north-east of Britain (Booth 2019, 22). Whilst no ancient DNA samples were taken from the Isle of Wight as part of the study, the results imply that the genetic make-up of people from the Mesolithic was minimal.

The archaeological evidence indicates the use of the Island's 'lateral ridge' for funerary purposes in the Neolithic, with long barrows on Afton Down and Mottistone Common, and a mortuary enclosure on Tennyson Down. This implies that a more open habitat

of chalk downland was developing due to human influence, an observation supported by the study of ancient snail shells. Artefacts such as polished stone axes and worked flint have been found across the Island, indicating exploitation of the landscape, with occupation sites on the downland and in lower-lying locations such as Whitecroft in the Medina Valley and Redcliff, overlooking Sandown Bay (Basford 1980, map 4).

*Bronze Age and Iron Age (c. 2200 BC to 43 AD)*

Research into ancient DNA has also identified a very significant population change at the start of the Bronze Age associated with beaker burial rites:

> *Ancient DNA analysis has demonstrated that population movement into Britain during the Beaker period was much more intense and on a significantly larger scale than previously thought. For British prehistory, the Beaker period looks like ground zero, after which Britain has a substantially new population, one that for the first time genetically resembled the majority population today* (Armit and Reich 2018, 19).

The burial practices of the Early Bronze Age give some indication as to where contemporaries lived, as well as where the elite were buried, in the distribution of round barrows. These were predominantly on the chalk downland (Basford 1980, map 6), but some barrows were located in lower-lying areas, for example Vittlefields (Basford 1980, map 6) and Puck House (Scaife 2012). The siting of barrows on downland may imply that burial sites were visible from not too distant settlements and the location of some barrows in lowland areas suggests not only the exploitation of these areas but habitation nearby. The evidence for the Middle and Late Bronze Age is much less visible, with burials in urn cemeteries, rather than prominent barrows. There are two examples from lowland sites, Swanmore and Barnes (Basford 1980, map 7), reinforcing the impression that settlement was located within the lower-lying regions either side of the 'lateral ridge'.

The Iron Age is also much less visible in the archaeological record, with only one definite hill fort, the incomplete promontory fort on Chillerton Down. The recording of inhumations and occupation from the Undercliff (Basford 1980, map 8) provides evidence for the exploitation of this landscape region. Despite the Iron Age population of the Island being largely invisible to archaeology, the fact that the future emperor Vespasian made a detour from mainland Britain during the Claudian invasion of 43 AD suggests that the Island was worth securing for Rome, being of economic as well as strategic importance. This in turn implies a population that was able to produce an agricultural surplus.

*Roman Wight (43 AD to 410 AD)*

The Isle of Wight has no Romano-British village or hamlet-type settlements which have been subject to detailed archaeological exploration. However, some areas of occupation debris have been identified from chance finds and developer funded interventions. Apart from the 'lower enclosure' beneath the curtain walls of Carisbrooke Castle, which arguably originated in the later Roman period (Margham 2015), the only known substantial settlement sites are the 'villas'. With the exception of the site at Gurnard, all known sites are associated with the Island's 'lateral ridge', either just beyond the margins such as Rock (Brighstone), Newport and Brading, or within the Bowcombe valley, at Bowcombe itself, at Clatterford and Carisbrooke. The building now lost to the sea at Gurnard would appear to have been a port building perhaps associated with stone quarrying nearby. Other villas may have existed, perhaps broadly located by the deposition of coin hoards at Farringford and Wroxall Manor Farm.

What can the archaeological evidence tell us about the population of Vectis? No reliable estimates can be made as to the size of the population during the Roman period. However, some inferences can be made in conjunction with evidence for the nature of the landscape, regarding the distribution of the population. Romano-British villas were essentially estate centres, so as well as being the residences of relatively well-off families, would have had estate workers living nearby. As we have seen, all definite villas of this sort were associated with the 'lateral ridge', with the possibility of a further site within the 'southern massif'. The focus of settlement would definitely have been along the margins of the chalk. Nevertheless, this would not exclude settlements in more outlying areas, for example within the 'southern vale' and 'northern lowlands', some probably of hamlet-size and in some instances perhaps seasonally occupied.

Evidence for settlement has increased as a result of the Portable Antiquities Scheme (PAS). For instance, a study of Roman coins recorded through the PAS has identified 38 'sites' consisting of five or more coins located within 200 metres of each other which are assumed to be settlement locations (Walton 2011, 242-250, fig. 96). Whilst PAS 'sites' have been identified throughout the Island, there are clear concentrations in the West Wight (perhaps because of greater metal-detecting activity), particularly on the Bembridge limestone plateau situated in the parish of Shalfleet and to a lesser extent along the margins of the 'lateral ridge'. There are very few 'sites' containing five or coins located on the Tertiary Clays of the northern half of the island, despite the presence of stray finds and hoards. This distribution appears to confirm the existing interpretation of Roman settlement patterns for the island. The PAS and the Historic Environment Record have recorded building material or other finds suggestive of Romanised buildings at various locations within the 'northern lowlands' (Basford 2013, 274-282).

**_Wihtland_: Early Medieval (410-1066)**

*The End of Roman Britain and the 'Adventus Saxonum'*

The end of Roman Britain, usually ascribed to the year 410 with the letter from the emperor Honorious instructing the people of Britain to look to their own defence, undoubtedly had a major effect on lifestyles in southern Britain. Life in towns and villas was declining or had come to an end, the legions had been withdrawn, and an economy based on coin was becoming a thing of the past. A decline in population along with woodland regeneration and the associated reduction of the area of arable agriculture is often attributed to this period. However, recent landscape history research has questioned this. *The Fields of Britannia* project examined continuity from late Roman Britain in the rural landscape. Whilst there is little direct evidence

from the Isle of Wight, the overall picture for the south-east region, from Dorset to Kent and north into Essex, demonstrated a broad pattern of continuity in terms of field systems and woodland cover, although 'In the early medieval period, the intensity of landscape exploitation does appear to have decreased ..' (Rippon *et al* 2015, 167). With our present state of knowledge, it is not possible to conclude any population trend for the Island in the early fifth century.

The next possibly significant event, or more accurately a process, for the inhabitants of the Island was the 'Adventus Saxonum', the coming of the Saxons, which Bede in his *Ecclesiastical History* ascribes to the year 449 AD (McClure and Collins 1994, 26-7). His account continues

> *They came from three powerful Germanic tribes, the Saxons, Angles, and Jutes. The people of Kent and the inhabitants of the Isle of Wight are of Jutish origin and also those opposite the Isle of Wight, that part of the kingdom of Wessex which is still today called the nation of the Jutes …*

Although well-informed by his contemporary bishop Daniel of Winchester, Bede was writing nearly 300 years after this supposed event and with a perception of the past from the early eighth century. In terms of material culture, however, there is something in this identification of a connection between Kent and the Isle of Wight (Brookes and Harrington 2010, 64-6). Modern research would not ascribe a specific date to a migration, seeing any migration happening over a period of time. The evidence of the pre-Christian early medieval cemeteries on the Island indicates the appearance of Germanic artefacts in the fifth century (Arnold 1982; Hines and Bayliss 2013). The degree of immigration continues to be a contentious issue in academic circles. It used to be commonly believed that the native Britons were exterminated and/or went to live in 'Celtic' western Britain as a result of the *Adventus.* This is no longer accepted. It is now generally held that the British population survived. Opposing views of what may have happened are represented by two contrasting books. Nicholas Higham (1992) has argued for an aristocratic domination of a native British population, whereas Francis Prior (2004) has claimed that there was little or no immigration from the continent, and that material and linguistic change can happen without changes of population. The degree of continuity or change is still being debated, and may possibly, in the case of the Isle of Wight and elsewhere, approach something of a resolution in the future with the study of ancient DNA.

We are on slightly firmer ground regarding the Isle of Wight's population in the mid-sixth century with the effects of a pandemic. Plague from Egypt reached the city of Constantinople in 542 where a contemporary estimate was 16,000 victims on one day. It progressed to Italy in the following year, and then on to Western Europe (Moorhead 1994, 99). Plague was not recorded in Britain, with the only broadly contemporary British historical source, Gildas' *De Excidio Britanniae*, not mentioning it, the implication being that it was almost certainly composed before the pandemic struck. However, 'Gaul suffered severely from this plague, which makes it very unlikely that Britain escaped' (Charles-Edwards 2013, 216). It is also quite likely that southern Britain was subject to an outbreak of plague in the following century. Bede, in his *Ecclesiastical History,* recorded that 'Almost at the same time that this kingdom [Northumbria] had accepted the name of Christ, many of the kingdoms of Britain were attacked by a virulent plague' (McClure and Collins 1994, 194-5), referring to events in 664.

Regarding the distribution of population, the location of the pre-Christian early medieval cemeteries (from the fifth to the early seventh century) on the Island as mapped by Arnold (1982), with sites restricted to the central chalk ridge and its margins, could be taken to suggest that the population of the Island was largely restricted to the lowlands adjoining this 'lateral ridge'. It is, however, possible that bodies or cremated remains were brought significant distances to a central location for burial. Moreover, an examination of the distribution of early Anglo-Saxon brooches and other artefacts recorded by the PAS suggests the presence of further cemetery sites, not all of which are restricted to the 'lateral ridge' and its margins. However, two definite additional cemeteries identified through the PAS, one represented by a collection of grave goods at East Afton and the other by a single identifiable grave with grave goods including a helmet near Shorwell, are both fairly close to the 'lateral ridge'.

The evidence of place-names indicates the presence of early estate centres and other settlements largely on the margins of both the 'lateral ridge' and the 'southern massif', in locations such as Calbourne, Brading, Shorwell and Chale, associated with route-ways. Much of the interior of the lower-lying areas of the Island can be seen as 'landscapes of colonization'; they were used extensively and in some locations seasonally, and became exploited more intensively through the early medieval period. An exception to this would be the margins of the gravel 'islands', both to the north and south of the central ridge, with settlement sites such as Hamstead and Bathingbourne, indicated by their early Anglo-Saxon place-names (Margham 2012).

*The Coming of Christianity*

The coming of Christianity and its role in the power politics of southern Britain had significant consequences for the population of the island which would later be known as *Wihtland.* The conquest of the Island by Cædwalla, king of the Gewisse (the West Saxons), in the 680s resulted in the nominal conversion of the *Wihtwaras* ('Wight-dwellers') and the granting of one quarter of the Island to the church as related by Bede:

> *After Cædwalla had gained possession of the kingdom of the Gewisse he also captured the Isle of Wight, which until then had been entirely given up to idolatory, and endeavoured to wipe out all the natives by merciless slaughter and to replace them by inhabitants of his own kingdom, binding himself, or so it is said, by a vow, though he was not yet Christian, that if he captured the island he would give a fourth part of it and the booty to the Lord. He fulfilled his vow by giving it for the service of the Lord to Bishop Wilfrid who happened to have come there from his own people at the time. The size of the island is 1,200 hides according to the English way of reckoning, so the bishop was given 300 hides. Wilfrid entrusted the portion he had received to one of his clergy named Beornwine,*

*who was his sister's son, assigning to him a priest called Hiddila, to teach the word and administer baptism to all who sought salvation* (McClure and Collins 1994, 197-8).

This episode apparently involved what we would now call 'ethnic cleansing', the extent of which at present is not known.

*Trade and Prosperity?*

Despite whatever happened to the inhabitants of the Isle of Wight due to Cædwalla, within a few years there is evidence of prosperity. To date, two 'productive sites', concentrations of coins and other metallic artefacts which are usually identified as trading sites, have been located on the Island. These are referred to as 'near Carisbrooke' and 'Shalfleet parish' in the literature and were in use from the early years of the eighth century, with activity tailing off later in the century (Ulmschneider and Metcalf 2013). The abundances of coins at these two sites implies that there was a surplus of produce to be traded, which would in turn suggest a thriving population, but beyond that no further inferences can be made.

*The Viking Age*

The Isle of Wight was of great strategic importance to the kingdom of Wessex and later the kingdom of England during the Viking Age, from the late eighth century through to the time of the Norman Conquest (Margham 2015). The Anglo-Saxon Chronicle documents a raid in the latter years of king Alfred under the anal for 897: '

*Then on a certain occasion the same year there came six ships to Wight and did great harm there, both in Devon and everywhere along the sea-coast' (Swanton 1996, 90).*

The events of the reign of Æthelred II ('The Unready') would presumably also had had consequences for the Island population with the use of *Wihtland* as a winter base by a Viking fleet in 1006 and as a base for raiding in 1009 (Margham 2015, 17).

## *Insula Vecta*: The Middle Ages (1066-1550)

*1086- The Evidence from Domesday Book*

The first survey of the assets of the kingdom of England as a whole was Domesday Book, completed in 1086. The information about the Isle of Wight is to be found in the folios for Hampshire (Williams and Erskine 1989). The survey is structured according to the land-holding of estates and is not a systematic description of every settlement. Population numbers are given in the Hampshire folios, as part of the assets of each manor, usually in the form of the number of villans, bordars and slaves. These individuals were generally the heads of households. The recorded population of the Isle of Wight was 1,068, which can be compared with that of the rural population of mainland Hampshire of 8,835 (Weldon Finn 1962, 314). The figures are not comprehensive, as there are omissions, such as some un-named Island estates in folios belonging to manorial centres in mainland Hampshire, and the unrecorded population of sub-tenancies (Margham 1989, 56-7). Calculations have been made to estimate the population of a given estate or region based on the numbers recorded in the text, but as Postan (1972, 32) has pointed out, 'the possible gap between the minimum and maximum estimates could be as wide as 150 percent'.

The fact that not all settlements were recorded and the uncertainties about actual population numbers does not mean that some inferences cannot be made regarding the population distribution of the Island in 1086. The present author has attempted to circumvent these issues by plotting the recorded population at manorial centres within each two kilometre grid square (Margham 1989, Fig 1). The map is not entirely objective for extensive estates, for example in the Northwood and Whippingham areas either side of the Medina estuary, as these encompassed more than an area of four square kilometres. Certain patterns can be deduced, however (Fig. 1). Much of the clayland of the Island's 'northern lowlands' was sparsely populated, with higher densities from the Shalfleet area through to the 'Freshwater Isle'. The interior of the dissected chalk plateau of the 'lateral ridge' to the west of the Medina, similarly had little or no population, as did the Medina headwaters in 'The Wilderness' area. The 'southern vale' generally had a higher density of population when compared with the 'northern lowlands' with apparent clustering of numbers around its periphery. Within the 'southern massif' there were similar clusters in the Niton and Wroxall areas, and a sparse population within The Undercliff. Basford (2013, Figure 9.7) has produced a map showing gaps in Old English place-names indicative of areas that were sparsely settled or devoid of settlement. She has also discussed the evidence of Domesday Book for population, settlement and land use (*ibid*. 169-183).

The small size of many manors implies the existence of hamlet-sized settlements. Some estates were more extensive, such as Shalfleet and Calbourne, and it is likely that these contained outlying hamlets. The only settlement which had any claim to be seen as a town was Carisbrooke, within the Bowcombe estate (Margham 1993), although the existence of some smaller settlement nucleations can be inferred, such as Arreton, Chale and Niton.

*After Domesday*

After the Domesday survey, there is no indication of the overall distribution of the Island's population from documentary sources until the fourteenth century. The first of these is the *Nomina Villarum* ('the names of townships') of 1316. This originated with the demand made of sheriffs of each county to produce a list of cities, boroughs and townships within each Hundred or Wapentake throughout England, to pay for foot soldiers due to the threat of a Scottish invasion (Blake 1952).

The information provided from the Isle of Wight lists 24 townships in the West Medine and 28 in the East Medine (Fig. 2). These are all labelled *hameletti* ('hamlets') with the exception of Afton, Thorley, Shalfleet, Carisbrooke, Newport, Yarmouth, Bembridge, Sandown, Brading, Arreton, St Helens and *Ourne* in the East Medine, the last-named probably being identical with Kern and Adgestone in 1334 (Feudal Aids 1900, 321-2; Hockey 1982, table XIII). Most of the settlements not labelled as hamlets were presumably either larger settlements or townships with dispersed settlement but with a relatively substantial population. These included the planned towns of Yarmouth and Newport, which had originated *c.* 1170 and between 1177 and 1184 respectively (Beresford 1967, 444, 449-50), and Brading. The latter was first granted a weekly market and annual fair by Edward I in 1285 (Page 1912) but

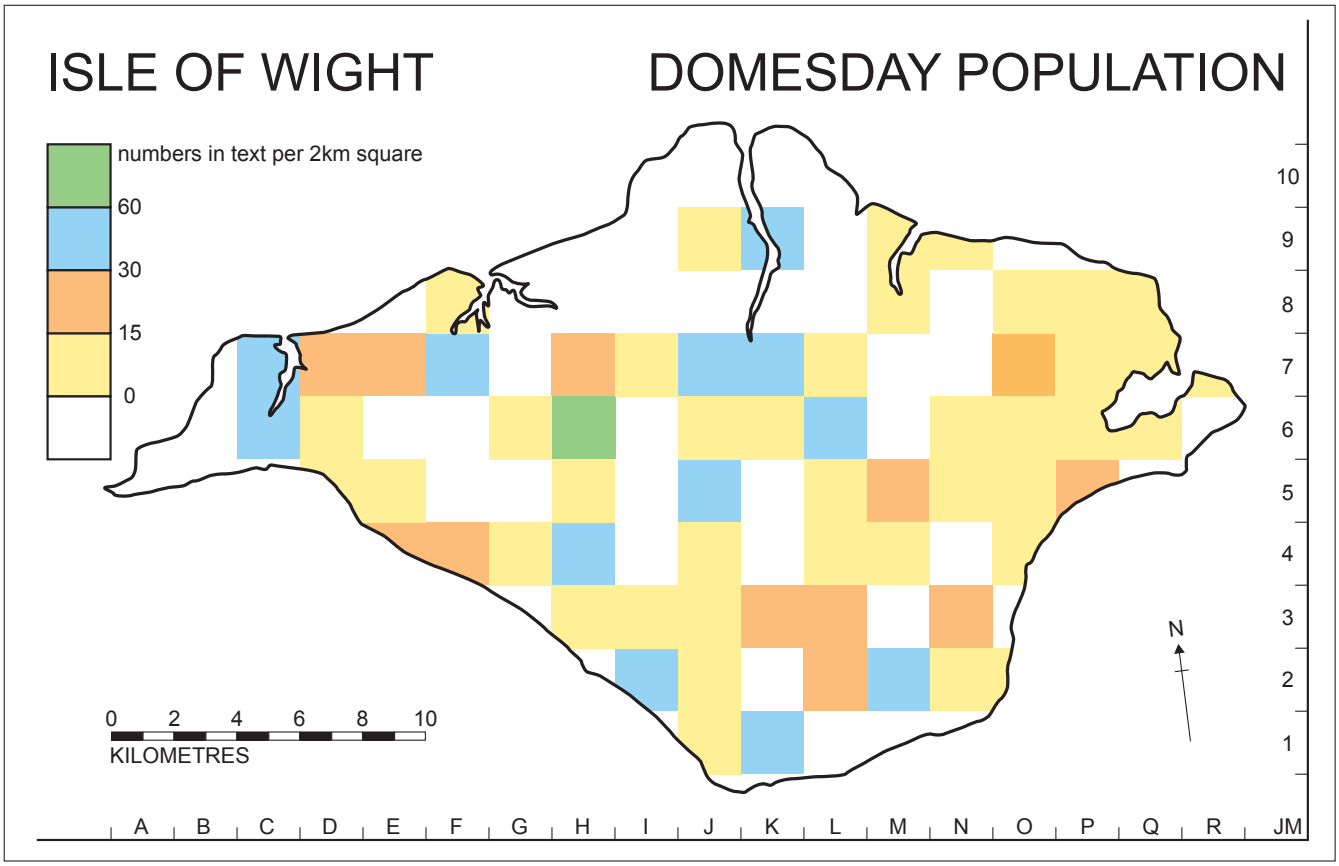


**Fig. 1:** The Domesday population of the Isle of Wight, based on Margham (1989, fig 1).

Webster (1994) suggests was founded by the Domesday Lord of the Manor of Whitefield, William Fitz Stur. The 'new town' which is absent from the *Nomina Villarum* is Newtown itself, founded 1255/6 (Beresford 1967, 445-6). Also absent from the document is Brighstone, included under Calbourne, and Freshwater, presumably as the liberty of Freshwater was exempt. Whilst the *Nomina Villarum* was not comprehensive, it provides an impression of the distribution of settlement in the early fourteenth century.

The overall settlement pattern was broadly similar to that at the time of Domesday Book, but with two exceptions. Firstly, there was the intervening development of towns with rectilinear street patterns, and the double row town of Brading. Secondly, whilst there were over 120 manorial centres in Domesday Book and only 41 townships in the *Nomina Villarum,* there are place-names in the latter which were not recorded in 1086. This is particularly apparent for the 'southern massif' and The Undercliff, which may suggest the expansion of settlement in these areas. The general continuity of settlement distribution from 1086 to 1316 reflects the observation that for Hampshire as a whole, post-Conquest population growth had little effect on the distribution of that population (Lewis and Mitchell Fox 1995, 9). Whilst the general trend for England was one of population increase, the tax of the fifteenth in 1225 suggests that the expansion of the county of Hampshire had risen relatively slowly between 1086 and the early thirteenth century (Lewis and Mitchell Fox 1995, 9).

*The Calamitous Fourteenth Century*

Barbara Tuchman's book, *A Distant Mirror* (1978) is subtitled 'the calamitous fourteenth century'. For the inhabitants of the Isle of Wight these calamities consisted of famine, plague and invasion. The *Nomina Villarum* inquest was conducted soon after the start of the Great Famine:

> *The troubles of 1315-22 disrupted social and economic life, and were associated with severe mortality which affected much of Britain, together with a large section of northern Europe. Analysis of tree rings shows that unusual climatic conditions prevailed beyond Europe, which suggests that the events recorded here formed part of some natural disaster. For England this was the worst famine in recorded history* (Dyer 2002, 233).

There is little direct evidence of how this affected the Isle of Wight, but it has been calculated that within the bishop of Winchester's manors in southern England wheat yields fell to 60% of the average in 1315 and to 55% in the following year (Dyer 2002, 229). The Great Famine undoubtedly caused hardship and probably death, but was as nothing compared with the events of the late 1340s.

The Black Death of 1348-50 left perhaps half of the population of Britain dead (Gummer 2009, xiii). Its effect on the Isle of Wight can be illustrated by various contemporary observations. There were many cases of infants who succeeded as land-holders due to the death of parents. In the manor of Shide, so many tenants had died that the lord of the manor, the keeper of St Cross Priory, had to find room for 30 oxen and one cow that the priory had received as death duties (Gummer 2009, 145). The Island would appear to be particularly badly affected by the plague if the mortality of priests reflected wider trends, as nearly every benefice had fallen vacant (Lewis and Mitchell Fox 1995, 9). In addition to such examples, 'The Isle of Wight was so reduced in population that, in 1350, the King remitted the tax due from the royal tenants' (Ziegler 1969, 113).

The Black Death occurred during the Hundred Years' War with France. This conflict came to the Island in the 1370s commencing in 1372 with an attack (Hockey 1982, 98). There may have been a landing on the Island two years later but this is not confirmed by English sources (Hockey 1982, 99). We are on firmer ground in 1377, with the French occupation from between 15th August and 10th September. The French landed on the north coast of the Island, and important persons were taken hostage, presumably to raise ransom money. Yarmouth church was burned, Newtown was apparently destroyed, and Newport was said to be uninhabited for two years afterwards (Hockey 1982, 100). The French were back in the early 1380s which resulted in the destruction of St Cross watermill, church and priory (Hockey 1982, 101). Early in the following century, in 1403, a French account recorded the burning of small villages on the Isle of Wight (Hockey 1982, 103).

The cumulative effect of the Great Famine, the Black Death and French landings undoubtedly led to population decline on the Isle of Wight. Despite the first two of these episodes, it has been estimated that the population of the whole of Hampshire (including the Isle of Wight) had risen by 53% from 1086 to the poll tax of 1377 (Lewis and Mitchell Fox 1995, 9). This population increase and subsequent decline is discussed in Basford (2013, 183-185) where it is suggested that population density in the fourteenth century was higher on the Isle of Wight than in mainland Hampshire. It can be concluded that the trend for the Isle of Wight was population increase until the second decade of the fourteenth century, probably followed by a decline, which was then greatly accentuated in the late 1340s. The events of the Hundred Years War, especially 1377, have to be seen against the background of documented recurrences of plague in the later fourteenth century and into the following century. Population decline undoubtedly happened in the later middle ages, but did this lead to settlement desertion on the Isle of Wight?

*Deserted Villages?*

The early literature on deserted medieval villages listed a plethora of deserted settlement sites on the Isle of Wight. The county gazetteer of deserted medieval villages published by Beresford and Hurst in 1971 itemises 32 sites on the Island. Most of these are existing settlements which are now farmsteads or small hamlets. The Isle of Wight does have an almost deserted medieval town but does not have any instances of substantial deserted villages such as the much excavated and researched example of Wharram Percy in the East Riding of Yorkshire. It has settlements which can be shown from physical evidence to have shrunken, a fine example being East Ashey Manor Farm with its adjoining earthworks. Other small manorial settlements with earthworks are Lower Watchingwell, Nettlecombe, Stenbury and Woolverton in Brading parish (Basford 2013, 189). Basford (2013, 189) has pointed out that 'At least sixteen of the Isle of Wight sites recorded by Beresford and Hurst correspond with the names of tithing units and in these cases the taxation figures for different sites appear to document a population decline within the whole tithing rather than in a specific settlement after which the tithing was named'. However, a few of the localities listed may have 'experienced severe shrinkage at a specific settlement site rather than a general decline in dispersed settlements within the entire tithing'. These localities in turn can be identified with Domesday manors having recorded populations of more than ten which had declined to single farmsteads when mapped in the 1790s.

The phenomenon of settlement shrinkage can be related to the decline in the population evidenced in the documentary sources. In a subsidy of 1428 no parish of fewer than ten persons was to be taxed. The Island parishes in this category were Wootton, Bonchurch, St Lawrence and Standen, which had a well-endowed chapel with a font in the later middle ages (Feudal

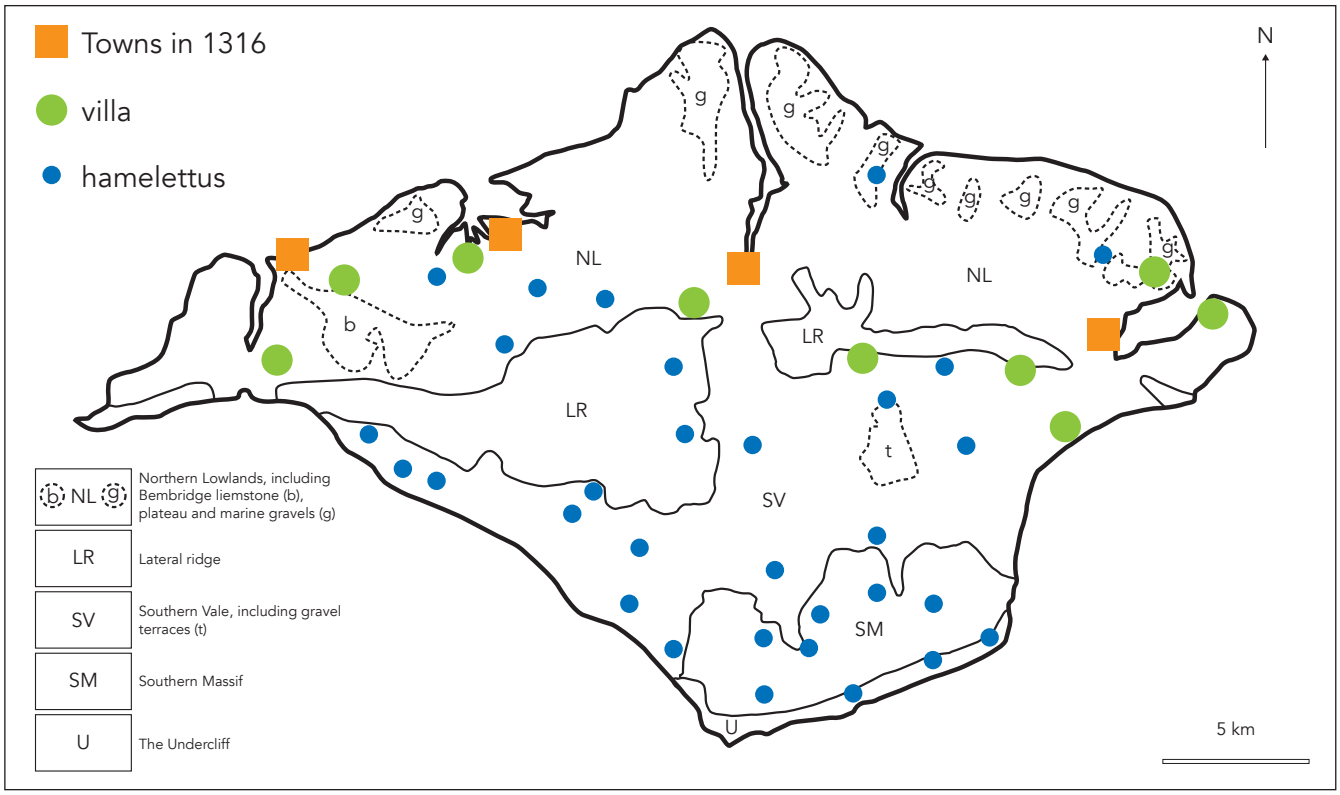


**Fig. 2:** Townships listed in the Nomina Villarum of 1315, contemporary towns and the historic landscape regions of the Isle of Wight.

Aids 1900; Hockey 1982, 8-9). Hockey (1982, table XIV) printed the taxation relief of 1445. The Island was granted a reduction of 22.9% of the total amount due in the lay subsidy assessment of 1334. This was specifically stated to be in aid of poor towns and villages damaged or destroyed. Hockey's table of the information from 1445 also highlights the places mentioned as destroyed in appeals for tax relief in 1380 and 1387. There was an act of parliament of 1488 specifically against the decay of 'towns' on the Isle of Wight. The concern here was primarily over defence of the south coast of England, rather than the Island being depopulated at a significantly greater rate than anywhere else (Beresford 1954, 104). The preamble of the act stated:

> *It is to the surety of the Realm of England that the Isle of Wight …. Be well inhabited with English people …. The which Isle is late decayed of people by reason that many Towns and Villages be let down and the field dyked and made pastures for beasts and cattles … The same Isle … is desolate and not inhabited but occupied with beasts and cattle, so that if hasty remedy be not provided that Isle cannot be long kept and defended but open and ready to the hands of the King's enemies, which God forbid.*

Beresford noted that whilst the enclosure of the landscape and the conversion of land to pasture were cited as causing the problem, 'the Act did not make conversion an offence' (Beresford 1954, 104). It did, however, identify the role of enclosure in depopulation.

**Early Modern Wight (1550-1800)**

*Rural Decline*

Although some medieval documents do record numbers of people, for example Domesday Book, and the lay subsidies of 1377/8 and 1522 (Hockey 1982, tables XV, XVI), these were all heads of households. It is not until the second half of the sixteenth century that we have absolute numbers. The Royal Survey of the Isle of Wight conducted in 1559 has detailed returns extant only for the 'centons' of Arreton St Helens, Mottistone and Newport. The survey notes 43 out of a total of 170 dwellings in the Arreton area and 16 of the 92 in St Helens were void (unoccupied), Jones (1978, 13) concluded that 'the picture from the centoners' testimony was of small farms being swallowed up in larger ones, with houses standing empty and armies of sheep nibbling the country population out of its subsistence'. A separate survey of the West Medine, excluding Newport, conducted in the following year identified at least 267 'void' tenements (Basford 2013, 192). Some of the void tenements recorded in the 1559 and 1560 surveys were settlements when mapped in the 1790s (Basford 2013, 192-3), implying the reoccupation of former settlement sites. Rural settlements declined in size and some smaller sites were deserted, at least for a while. What happened to the inhabitants of void tenements that were engrossed (subsumed within larger farms)? It would appear that the trend on the Island in the later sixteenth century was population movement from the countryside into towns (Jones 1978, 13; Basford 2013, 193). The growth of towns in the early modern period is investigated below.

*Counting Heads and Hearths*

The 1559 royal survey of the Island was carried out by three commissioners, one being Sir Francis Knollys. From the original centoners' reports, Knollys drew up a general report which was primarily concerned with defence. Article IV of this report states '*Number of inhabitants: 1,880 able men for the wars, and 6,887 aged men, women and children'* (Kenyon 1979, 62*),* thus providing a total population of 8,767. Two ecclesiastical censi which included returns from the diocese of Winchester took place in the seventeenth century. Both record the number of males and females over the age of sixteen. The earlier census dates from 1603 (Dyer and Palliser 2005, 496-7). The round figures for some parishes such as 1200 in St Helens and 600 in Newchurch suggest a certain degree of estimating, but generally modern editors regard the returns from the diocese as reasonably reliable (Dyer and Palliser 2005, 484). The total number of inhabitants over the age of sixteen can be calculated as 6,749. Bishop Compton's ecclesiastical census of 1676 was also compiled from returns made from the incumbent of each parish. Like its predecessor, it recorded the number of conformists, papists and nonconformists. All persons both male and female who are by law in a capacity to receive the Holy Communion' were to be enumerated. This would appear to have been adhered to in most cases, for

> '*Taken on their own… the surviving incumbents' returns confirm by and large the assumption that those over sixteen, and of both sexes, were generally reported'*
>
> (Whiteman and Clapinson 1986, xxxvi).

The total number recorded for the Isle of Wight was 8,610. The proportion of inhabitants under the age of sixteen is unknown in both sets of returns. A total population for the Island of perhaps of about 10,000 in 1603 and 13,000 in 1676 may be reasonable estimates, assuming that approximately one-third of the population was under the age of seventeen.

The Compton census is complemented by the broadly contemporary hearth taxes, levied between 1664 and 1674 (Russell 1981). Whilst these documents do not record the total population, they list the heads of households who were liable for taxation and those who were exempt from paying. As the returns are arranged by tithings, which in most cases were sub-divisions of parishes, they provide more precision as to the distribution of population across the Island. The publication of the hearth taxes included a distribution map, which is reproduced here (Fig 3). The overall distribution of population would appear to be not dissimilar to that in 1086. The exceptions to this would be the development of the towns of Yarmouth, Newtown, Newport, West Cowes and Brading (see below), and of nucleated villages such as Newchurch and Godshill.

Worsley published information about population in his *History,* and concluded that 'the Isle of Wight appears now to contain eighteen thousand and twenty-four inhabitants, exclusive of the troops quartered there' (Worsley 1781, 9-10). This figure included 530 residents of the House of Industry (Worsley 1781, appendix VI). These numbers were compiled by the clergy of each parish in the year 1777 and demonstrate a continued growth in the Island's population from the later seventeenth century.

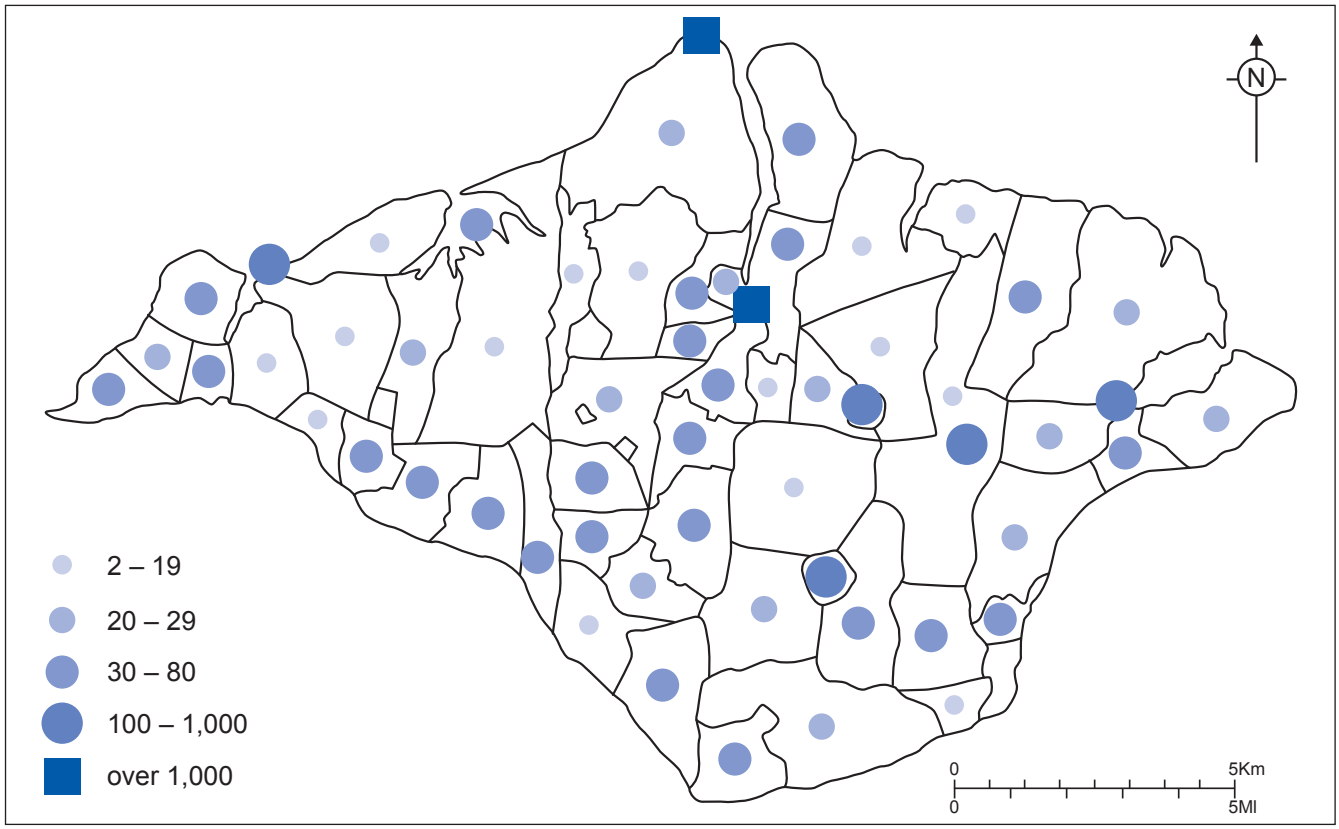


**Fig. 3:** The distribution of hearths per square mile based on the Isle of Wight hearth tax returns 1664 to 1674, based on Russell (1981).

*Towns in the Landscape*

Carisbrooke had a toll in 1086, which implies that it had a market and can be seen as then being a small town (Margham 1993). This function as a 'central place' for the Island was eclipsed by Newport which was founded in the late twelfth century. The first map of Newport was produced by John Speed in 1611 (Basford 1980, map 15). This shows Newport to be largely confined to its medieval bounds, as represented by the chapelry of Newport boundary mapped in the six-inch survey of 1862/3. The extant centoners' returns for the 1559 Royal Survey had included a return for the town of Newport, enumerating a total population of 1,175. In addition to some larger holdings, 370 house plots were listed (Webster 1975-1997, 3a, 3b). The approximate number of communicants within these bounds was 1,100 in 1603, and 1,082 in 1676. This area contained 401 households in 1665, with a further 31 households in Castlehold and two more at St Cross (Russell 1981, 71-4, 85, 88). Towards the end of our period in 1777, the total population of the town of Newport was 2,778 inhabitants (Worsley 1781, appendix VI), with this figure including the suburbs of Node Hill to the south (in Carisbrooke parish), Castlehold to the west (St Nicholas parish) and Coppins Bridge over the Medina to the east (Whippingham parish).

The planned town of Yarmouth also originated in the later twelfth century. Unlike Newport, much of its history since its foundation was one of relative decline. The map of 1793 shows much of the south-eastern quarter of the town as largely unoccupied. This may, however, be due to the grid of streets never being fully occupied rather than settlement shrinkage, there being only 16 heads of households recorded in 1377/8 (Hockey 1982, table XV). Twenty-four tenements were itemised in the Royal Survey of 1559, along with various references to 'voyd grounds' and 'voyd decayed', presumably unoccupied burgage plots (Webster 1975-1997, 4b). The population did grow substantially in the seventeenth century, with 136 people over the age of 16 in 1603 and 313 in 1676. There were 46 households in 1665 (Russell 1981, 76), which when compared with the diocesan survey of a few years later, implies a high occupancy of each household. There were 268 inhabitants in 1777, indicating further growth in the population from a century previously.

The town that declined in absolute numbers from its foundation in the thirteenth century was Newtown. Thirty heads of households were recorded in 1377/8 (Hockey 1982 table XV). The Royal Survey of 1559 listed 27 tenements and 12 void holdings (Webster 1975-1997, 4b). In 1793 there were only 17 buildings within its bounds, there having been 12 households in 1665 (Russell 1981, 75).

The only other medieval town on the Island (with the exception of Carisbrooke) was Brading. The granting of a charter in the late thirteenth century may very well have formalised an existing situation, rather than marking the foundation of a settlement with an urban function. Unlike Newport, Newtown and Yarmouth it was not planned out using a grid of streets, but its regular two-row form, as depicted on the 1793 map, may very well evidence some settlement planning. The 1665 hearth tax lists 61 households. By the time of the first national census in 1801 Brading was in decline relative to Newport and Cowes, and in the nineteenth century it ceased to have a market and a fair (Page 1912).

The Island town which became established in the early modern period was Cowes. Its development did not start until the early seventeenth century, despite the earlier existence of the settlement of West Shamlord (Jones 1978, 178-9; Basford 1980, 51). By 1665 there were 157 households and it had a population of 1,660 inhabitants in 1777. The substantial nature of the town by the late eighteenth century is reflected in the map of 1793.

*The Pattern of Settlement in 1793*

As we have seen, the last ecclesiastical census of the Island enumerated a resident population of 18,024 in 1777. The first detailed mapping survey of the Isle of Wight was completed in 1793. These six-inch scale maps, which formed the basis of the first edition one-inch map of 1810, provide a detailed picture of the distribution of the Island's population only eight years before the first national census. The six-inch survey depicts the medieval towns of Newport, Yarmouth and Brading, and the shrunken town of Newtown, as well as the thriving town of West Cowes, along with its developing smaller neighbour East Cowes. At this time Upper Ryde was a substantial village consisting of two regular rows of buildings, with Lower Ryde a separate community along the shore. Other substantial regular two-row settlements were Brading and Carisbrooke. The modern towns of Sandown, Shanklin and Ventnor were no more than small rural settlements in 1793.

The rural settlements of the Island have been classified as villages, hamlets and dispersed settlements by Vicky Basford (2013, fig 8.5) and the forms of villages were mapped by the present author as part of a study of settlement morphology (Margham 1985, fig 4). Village-sized settlements were identified within the 'northern lowlands' westwards from Freshwater to Shalfleet, and from Wootton round to St Helens. The 'northern lowlands' had an abundance of dispersed settlement sites and several hamlets. Villages and larger hamlets were largely restricted to the margins of the 'lateral ridge' with sites such as Calbourne, Carisbrooke and Chillerton, with hamlets and dispersed settlement sites sharing a similar distribution with the exceptions of within the ridge in the Bowcombe valley and the Standen area.

The 'southern vale' had some villages, largely restricted to the margins such as Brighstone and Arreton, with Newchurch being the only village in the vale's interior. Hamlets and dispersed sites were distributed across the 'southern vale'. The 'southern massif' smaller settlement sites were largely restricted to the lower-lying northern margins, with the villages of Niton and Wroxall associated with valleys within the massif. The Undercliff had no village settlements, having hamlets and dispersed settlement sites throughout much of its length. Much can be said about the forms of villages and hamlets, but this is beyond the scope of the present study. However, one observation can be made regarding the development of settlements. The presence of street settlements such as Thorley Street and Arreton Street as depicted on the 1793 survey indicate settlement shift away from medieval church-manor sites, in the case of Thorley leaving the manor site isolated, with the church being relocated in the nineteenth century.

## Conclusions

This study has summarised the evidence for population levels and distribution on the Isle of Wight from the earliest prehistory through to the late eighteenth century. Despite the limitations of the evidence for much of this time scale, inferences have been made from diverse sources. Various themes can be identified: the low density of a largely transient population in earlier pre-history; the establishment of a more permanent population in later prehistory even though significant genetic changes took place; the relative wealth of the Island in and perhaps before the Romano-British period; plague, 'ethnic cleansing' and Viking depredations in the early medieval period; a rising population to the early fourteenth century followed by population decline; and eventual recovery and population increase through to (and beyond) the late eighteenth century. A further study will examine the population of the Island from the first official state census in 1801 through to the present.

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# THE ROYAL SURVEY OF THE ISLE OF WIGHT 1559 - 60

The Transcript at the Isle of Wight County Record Office

***Dr Vicky Basford***

**Abstract** *The early Elizabethan Royal Survey of the Isle of Wight is known locally largely through the work of Clifford Webster, former Isle of Wight County Archivist, who has spent many years transcribing information from the survey and supplementing this information with manorial histories. A typescript of the transcription is available at the Isle of Wight County Record Office. This article pays tribute to Clifford's work and draws on his unpublished notes at the Record Office. The various original documents comprising the survey are described and the locations of these documents are identified. The text of the Record Office transcription is examined and the value of the transcription in historical research is highlighted.*

## Background to the Royal Survey

On 20 November 1559, Queen Elizabeth and her Privy Council ordered a general survey to be made of the state of the Isle of Wight. This was one of several surveys of areas of military significance or at threat from invasion, including Portsmouth, York, Berwick, Chester, the Tower of London, and Ireland. The Island had in fact been subject to a brief French invasion in 1545 (Fig. 1) and the earliest map of the Isle of Wight (Fig. 2) shows fortifications on the mainland and the Island.

A commission was issued to Sir Francis Knollys, Vice-Chamberlain, Sir Edward Warner, Lieutenant of the Tower of London and John Goodwin, Surveyor in the County of Southampton to 'survey the state of the Isle of Wighte and the fortifications and castles by the sea in the county of Southampton'. The Head of the Commission, Sir Francis Knollys, was himself a Privy Councillor. He undertook the survey by instructing the captains of the various centons or military divisions of the IW, known as 'centoners', to answer nineteen questions or articles about their areas and to suggest improvements in the government of the Island. The third article asked that a general survey of all the properties in each centon be made, mainly, it would seem, to show how much depopulation had taken place. The Privy Council do not seem to have been satisfied with the answers to this, at least in the West Wight, for a new survey of West Wight (or West Medine), excluding Newport, was ordered, and carried out in 1560 (Webster nd).

## Location and Content of Original Royal Survey MSS

The various centoners' reports were kept among Government papers and four of these, from St Helens, Arreton, Newport and Mottistone, were discovered many years ago in the National Archives. There is a possibility that the other centoners' reports (potentially at least six more) will turn up when unsorted material at the National Archives is catalogued.

From the centoners' reports, Knollys drew up a general report which was kept with his private papers and is now in the Staffordshire Record Office. A digital copy of this report has been inspected by the author. A discussion of the general report was published by Kenyon (1979), focussing on replies to military questions but also describing the overall format of the report.

This consisted of fourteen folios, together with basic outline plans of most of the fortifications. The survey can be divided into five sections. The first consists of a series of nineteen articles or questions put to centoners and a summary of the replies given. The second section describes the forts and castles on the Island and the third lists the garrisons and puts forward proposals for extra men. The final two sections are orders, such as the levying of men to work on and defend the fortifications, petitions concerning the decay of the towns of Yarmouth and Newtown, and the order that all unserviceable ordnance should be sent to the Tower of London.

The first part of Knollys' general report, outlining the responses to the nineteen articles put to the centoners, has been summarised by Kenyon (1979, 62-63) as follows:

*I The number of parish churches (25) and the value of their benefices.*

*II Parish churches: more than can be maintained.*

*III Town and parishes held by the 'Chyefe Lordes'.*

*IV Number of inhabitants: 1,880 able men for the wars, and 6,887 aged men, women, and children; 'And Ordinaunce armour and weapons of their charge', which included four brass falcons and eleven brass falconets, smaller pieces of culverin-type cannon.*

*V List of landowners who had to provide men in time of war: for example, out of the 56 men required, Trinity College, Cambridge, owed 3 and Lady Winifred Hastings had to find 11, the highest number extracted from any one person or institution.*

*VI, VII, VIII 'We aunswere not in this place but do here after answere in thende of this booke amongst the Castelles and fortresses'.*

*IX Forest ranger and keepers: the use of forest waste.*

*X The answer was referred to 'the ptycular bookes' as the commissioners had no time to survey the crown lands.*

*XI The timber and wood on the island. The Queen had 76 acres of timber, with 2,153 trees, and 122 acres of coppice wood. The other landowners between them had 149 acres of timber, 320 trees, and 685 acres of coppice wood.*

*XII The landing places about the island and their nature (ff. 3-4). For example, 'Sharpnore a myle and a halfe est within Laces bay, a fayer Landinge place a quarter of a myle longe and shore depe at all tydes'.*

*XIII 'To the xiijth we aunswere that they be in very goode Ordre and mooste aptely placed and thauncyente Orders thereof in tyme of warre very well observed, excepte one or two places, where ys some small contencion whiche ys to be ordered by the Capteyne that shalbe appointed'. This may refer to the island's militia.*

**Fig. 1:** Detail from the Cowdray engraving, looking south. This shows the French attack on the Island in 1545. Bembridge Haven extends from St.Helen's on the left to Sandown on the right, cutting off Bembridge Isle where properties are being burnt by the French. Yarbridge is defended by a small battery. Sandown Fort looks like an Island situated on the end of a large spit.

**Source:** The Cowdray Engraving, James Basire. 1778. Copy of an original painting dating from 1545-1548, burnt in a fire at Cowdray House, Midhurst, West Sussex. Image reproduced by permission of the Isle of Wight County Record Office.


**Fig. 2:** Map of Isle of Wight 1570 from an atlas belonging to William Cecil, Lord Burghley, Elizabeth I's Secretary of State. Forts are shown on the mainland and the Island.

Cartographer: John Rudd © British Library Board: Royal MS.18.D.III f.18

*XIV The island's ships: 39 vessels of 140 tons, able to carry 1,000 men at one time.*

*XV The centoners and centons.*

*XVI Hurst Castle, answered in the fortress section.*

*XVII 'lykewise auneswered'.*

*XVIII The decay of people and settlements. Of the 323 empty farms and tenements 'the most parte hathe bene voyde tyme out of mynde'. The commissioners planned to deliver certain requests made by the islanders in order to rectify the situation.*

*XIX The government of the island.*

It can be seen that many of the articles in Knollys' general report simply refer readers to the more detailed centoners' reports.

Kenyon's abbreviated summary of Article III does not give a clear idea of the scope of this article. The original manuscript entry in Knollys' report reads as follows:

***To the thirde article*** *we finde that there be townes and p[ar]ishes xxvi. who be the chyefe Lords of the same, by what tenure they holde the same and of whome, and also what other lands is in every suche towne or p[ar]ishe, besides the cheyfe lordes mannors or Landes, and of whome the same other landes ys holden, yt is more at large detailed, as neare as may be learned, in severall Bookes made and delivered unto me, by the Centoners of the Said Isle.* [1]

As mentioned above, the Privy Council was not satisfied by the centoners' detailed answers to this article, at least in the West Wight, for a new Survey of the West Medine area, excluding Newport, was ordered, and carried out from 20th November 1560.[2] This was arranged, not by the military divisions of the centon, but by the civil divisions of the township or tithing. The 1560 Survey came into the hands of Sir Richard Worsley of Appuldurcombe, either by inheritance from his forbears or as part of the manuscript collection he acquired when writing his History of the Isle of Wight (Worsley, 1781). It was subsequently deposited in the Lincolnshire Record Office by his descendant, Lord Yarborough.

**Partial Transcription of Royal Survey by Clifford Webster**

A transcription of material from the Royal Survey was undertaken by Clifford Webster between 1975 and 1999 on behalf of the Isle of Wight County Council (later the Isle of Wight Council). A digital version of this text is preserved at the Isle of Wight County Record Office and a typescript is available for inspection by researchers.

The 1559 Royal Survey forms the basis of Webster's transcription for East Wight (East Medine) within the centons of Arreton and St Helens where centoners' returns have survived. Webster does not provide a transcription of all the articles in the Royal Survey but only of Article 3 which gives information on landowners and land holdings. The transcription for Newport is also based on the 1559 Survey.

Webster's transcription for the West Wight (West Medine) comes from the 1560 Royal Survey and is arranged by parishes and tithings. As in the East Medine, the transcription covers only Article 3 of the survey and it may be that the re-survey of West Medine in 1560 dealt purely with this article.[3] It is estimated that the surviving returns for the two surveys of 1559 and 1560 cover three-quarters of the Island. In those parts of the East Medine where the 1559 centoners' returns have not survived, Webster has reconstructed the information in Article 3 from surveys of the Manor of Ashey with Ryde, the Appuldurcombe Estate (1573), the royal estates (1583 and 1608), Winchester College (1553) and other sources (Webster nd). However, the Record Office typescript does not contain information on Niton, Brading Town or Bembridge.

Although Webster's material is not a complete transcription of the Royal Surveys of 1559 and 1560, it provides invaluable information about the Isle of Wight's landscape, landholdings, and landowners in the mid-sixteenth century. The text below is an example of a typical entry transcribed from the centoners' return for Arreton in the 1559 Royal Survey:

***Arreton Manor House***

***Lands of the Queene, parcel of the monastry of Quarr. Her Highness hath there the manor place or farm of Arreton in the tenure of Barnabie Lee, gent., rented at £7 16s 0d***

This entry deals with the manorial centre at Arreton. It is the last of a series of entries that deal with Arreton Manor. The foregoing entries deal with copyhold and other tenancies belonging to the manor or with properties that were in different ownerships in 1559. This pattern of entries, where the description of the manorial centre follows that of dependent tenements and other properties, is the standard way in which Webster's transcription of the Royal Survey and other near-contemporary manorial surveys is laid out.

In those areas of East Medine where the centoners' returns are not available and other surveys have been used, Webster treats the source material in a similar manner to the entries derived from Article 3 of the 1559 Royal Survey. The material derived from sources other than the Royal Survey therefore cannot usually be distinguished from transcribed Royal Survey material in Webster's text. This can present a difficulty for researchers who need to cite sources accurately and they will need to discuss entries with staff at the Isle of Wight Record Office to identify the original source material. The picture is more straightforward in the West Medine since the transcription is based almost entirely on the 1560 Royal Survey in the Lincolnshire Record Office apart from a few insertions from the 1559 survey and from the surveys of Crown property on the Island in 1583 and 1608. However, the way in which the survey has been set out has been changed by Webster (1975) so that parishes are arranged in a different order and all the land owned by one person has been listed together. Headings have also been inserted in the text for clarification and repetitive lists have been reworded to shorten them.

It is accurate to refer to the digitised material from the 1559 and 1560 Royal Surveys as a 'partial transcription' in that the entries derived from these surveys deal only with the responses to Article 3 and that information from the original 1559 Royal Survey is available only for Arreton, St Helens and Newport. Nevertheless, in limiting his transcription to Article 3, Webster has concentrated

on that part of the survey material which provides the most important information about landholding, the organisation of agriculture and settlement on the Isle of Wight. Article 3 sets out details of all the Island's manorial holdings and the freehold, leasehold, and copyhold tenements within these manors, including the names of owners and tenants.

The entries in the Isle of Wight County Record Office text, whether transcribed from the 1559 and 1560 royal surveys or compiled by Webster from other sources, provide a wealth of information about Tudor landholding and settlements on the Isle of Wight. Moreover, Webster offers much additional information since nearly all the entries are followed by detailed tenurial histories of individual holdings compiled by Webster from other sources, often commencing in the medieval period and usually continuing to the 1840s when tithe surveys for the Island were completed. In some instances, the histories extend into the twentieth century. Webster's work, in fact, provides a near-complete manorial history of the Isle of Wight with gaps only where no information is available from the royal surveys or other sources. The histories of individual manors are generally referenced to sources in the Isle of Wight Record Office or held in mainland archives.

Locations of land holdings dating back to the medieval or early post-medieval period have, in many cases, been identified by reference to numbered land parcels in the nineteenth-century tithe schedules. The Isle of Wight Record Office holds tithe maps and schedules for all Island parishes so these can be used to plot the boundaries of land holdings described in the royal surveys. One particularly valuable aspect of the manorial histories is the very full use they make of the 1608 Survey of Royal Lands on the Isle of Wight. Royal lands covered a considerable part of the Island, and the 1608 Survey provides much more detailed information on individual holdings than the 1559 and 1560 surveys, giving individual field names with the acreage and land use of these fields.

The Royal Survey transcriptions and manorial histories available at the Isle of Wight Record Office include work carried out by Webster from 1975 until 1999. Since 1999, Webster has continued to work on the project, concentrating on using near-contemporary sources to fill in gaps in the Royal Survey of the East Medine, particularly for Brading and Bembridge. He has been assisted by Fanny Oglander who has helped to prepare digital files. These files provide some additional material for manors already covered in the Record Office files, as well as dealing with manors and areas not included in these files. It is hoped that Webster's new work can be made available to the Record Office in the future.

**Use of the Royal Surveys in historical research**

Use of the Royal Surveys for published historical research has been surprisingly limited to date. Dr Jack Jones, former Curator at Carisbrooke Castle Museum, made use of Knollys' general report in his article on 'The building of a fort at Sandown, Isle of Wight' (1968). Knollys' report was also the main source for an article by J. R .Kenyon (1979) entitled 'An aspect of the 1559 Survey of the Isle of Wight: *The State of all the Quenes maties Fortresses and Castelles'*. Kenyon's article refers to Jones' 1968 study of Sandown Fort.

Jack Jones' PhD thesis (1978) on *The Isle of Wight 1558-1642* made considerable use of the 1559 Survey. He drew extensively on the surviving centoners' returns for Newport, Arreton and St Helens, citing not only the responses to Article 3 (which form the basis of the Isle of Wight Record Office transcription) but also the responses to various other articles dealing with enclosure, depopulation, and other subjects. This thesis is available at the Isle of Wight County Record Office. It paints a comprehensive picture of Island life in the century following Elizabeth I's accession to the throne, covering land use and landscape, social structure, town life, trade, shipping and piracy, industry, puritanism and recusancy, politics and administration. Jones draws on other important primary sources as well as the Royal Survey, for instance Newport Borough manuscripts and the Oglander papers. Nevertheless, the 1559 Royal Survey was a key source for the thesis. Curiously, Jones does not refer to the 1560 Royal Survey of the West Medine in Lincolnshire Record Office and possibly was unaware of this source even though he completed his thesis in the late 1970s when Webster had already started work on his transcription of the 1560 Survey.

The present author has drawn extensively on the Isle of Wight County Record Office transcription and associated manorial histories in her PhD thesis *The Isle of Wight in the English Landscape: Medieval and Post-Medieval Rural Settlement and Land Use* (Basford, 2013a). She describes the Record Office text as 'the source that offers the greatest potential for study of the Island's medieval and early post-medieval landscape' (Ibid, 87). Her thesis includes a study of enclosure and historic field patterns in different parts of the Island. For this topic, extracts from the 1608 Survey of Royal Lands in Webster's document were particularly valuable. Another major theme of her thesis is historic settlement patterns on the Isle of Wight. Here, Basford drew mainly on the unpublished 1793 six-inch Ordnance Survey of the Isle of Wight but in fact the 1559 and 1560 Royal Surveys could also have been utilised more fully to explore this topic since the surveys provide lists of tenements and tenement holders for many of the Island's settlements. The topic of depopulation is discussed in Chapter 7 of Basford's thesis (2013a, 183-194) which drew attention to the large number of 'void' (empty) properties identified in the Royal Surveys of 1559 and 1560. In discussing void tenements, Basford also used information in Jones' 1978 thesis and acknowledged that more work needed to be done on the royal surveys to obtain a clear picture of depopulation and engrossing of land in the 16th century[4]. Her thesis is available at the Isle of Wight Record Office and online. Two articles based on the thesis have also been published (Basford 2013b; Basford 2014).

Internet searches do not reveal any use of the 1559 and 1560 Royal Surveys in national research apart from the article by Kenyon (1979). This is surprising, given the great potential of the surveys for various topics including landscape history, manorial history, settlement history, military history, social history, and family history. There is a need for further examination of the original centoners' returns preserved at the National Archives, building on the work of Jones (1978), and concentrating on aspects of the returns other than Article 3 which forms the basis of the Isle of Wight Record Office transcription[5].

Academic use of Webster's text in the Isle of Wight County Record Office requires an understanding of the various sources from which it is compiled. Nevertheless, the multiple sources making up the text give it a very great value, bringing together in one place a vast quantity of information, searchable in the digital version and incorporating very fully referenced manorial histories as well as the entries derived from the royal surveys and contemporary documents[6]. It would be exceedingly difficult for individual researchers to access this vast body of material by means of the original manuscripts but the work undertaken by Webster makes it easily available.

One fruitful area for research using the Isle of Wight Record Office text would be a study of local landholding patterns comparing the percentage of freehold, leasehold and copyhold tenements on the Island with those elsewhere on the mainland. The text could also be used for a study of common land on the Isle of Wight based on rights of common held by copyhold tenants.

A further area of research could be a study of the Island's villages, hamlets, and scattered farmsteads. Jones (1978) used the 1559 Royal Survey in the chapters on Newport within his thesis. However, information is also available in the 1560 Royal Survey of the West Medine on the medieval boroughs of Yarmouth and Newtown although both were small settlements in the Tudor period. Brading is not covered in the surviving portions of the 1559 Royal Survey dealing with the East Medine and is thus not described in the Isle of Wight Record Office text. However, the archive of Brading Town Trust is available to fill the gap and Clifford Webster is currently working on this material. The combined material from the Record Office text and the Brading Town Trust Archive potentially offers an opportunity for a comparative study of the Island's towns and quasi-urban settlements in the context of mainland settlements of similar size.

## Conclusion

The purpose of this article has been to draw the attention of researchers to the important resource provided by the 1559 and 1560 Royal Surveys of the Isle of Wight and to the valuable work done by Clifford Webster, not only in offering a transcription of part of the original text, but also in compiling immensely useful manorial histories to stand alongside this text. It is hoped that future research into local landholding, settlement patterns and many other aspects of Island life from the time of Domesday Book will utilise the text available at the Isle of Wight County Record Office and that further investigation of the original sources will also take place.


## Acknowledgements

Clifford Webster, former County Archivist, has read this article and has answered queries by the author about the royal surveys over many years.

Richard Smout, Heritage Service Manager of the Isle of Wight Council, has discussed the text held in the Record Office with the author. He has also read and commented on this article.

Fanny Oglander has talked with the author about her continuing assistance to Clifford Webster in his work to complete gaps in the Royal Survey coverage of East Medine from other sources. She has also read this article.

John Margham and Paul Bingham have read the article and suggested improvements to the text.


## End Notes

[1] There is an apparent discrepancy between the 25 parish churches recorded under Article I and the 26 'townes and parishes' recorded in Article III. The reason for this difference is that the town of Newport possessed only a chapel, not a parish church, coming under Carisbrooke Parish. The chapels at Brook, Northwood, Whitwell and Shanklin were not recorded under Article III.

[2] The date of 20 November 1560 is included at the start of the Record Office Typescript covering the Parish of Freshwater.

[3] The original manuscript of the 1560 West Medine Survey has not yet been inspected by the author.

[4] 'Engrossing' was the practice of amalgamating land holdings, often leading to the dispossession of tenants and to their former houses becoming 'void' (empty). Engrossment was considered a cause of depopulation and was commonly complained about in the sixteenth century.

[5] Webster (nd) provides details of the St Helens and Arreton centoners' responses to articles 1-19.

[6] At present, Webster's text is only available to researchers at the Isle of Wight Record Office as a typescript, but it is hoped that eventually it can be made available electronically.

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Dartmouth Papers D(W)1778/iii/O/1/A-B, December 1559 *The generall Survey of the state of T[he Isle] of Wight.*


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Calendar of Patent Rolls 1939 *Eliz., vol. 1,* 1558-1560, 443.*1559 20* Nov *Commission returnable to the Queen … or the Privy Council to Francis Knolles, Knight, councillor, vice-chamberlain, Edward Warner knight, and John Goodwin, surveyor in the county of Southampton (or two of them) to survey the state of the Isle of Wighte and the fortifications and castles by the sea in the county of Southampton according to articles annexed hereto.*

Webster C D 1975-1999 *The Royal Surveys of the Isle of Wight: East Medine and West Medine 1559-1560.* Unpublished typescript in Isle of Wight County Record Office comprising transcription of Article 3 (from 1559 centoners' returns and 1560 Survey of West Medine),

extracts from other manorial surveys and attached manorial histories.

**Map Source**

Ordnance Survey, 1793-4: Eight unpublished drawings in British Library at a scale of six inches to one mile (OSD 67-74). Available from:
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# PIER BENEATH: OBSERVATIONS OF THE MARINE FLORA AND FAUNA ASSOCIATED WITH YARMOUTH PIER, ISLE OF WIGHT.

***Roger J.H. Herbert, Alice E. Hall, Mark Eames, Adrianus G.T. Goudswaard, Sam Greenhill, Ken Collins, Jenny Mallinson & Sue Hawley***

**Abstract** *With numbers of offshore structures increasing around our coast, it is important to understand how marine organisms might be affected by these developments. Benthic species may benefit from a greater surface area for colonisation, and it is possible that aggregations of fish, normally associated with rocky reefs, may become established. The extent to which fish utilise structures for grazing on surface benthos, for refuge or to hide in ambush for prey, is poorly understood. Here we present results of survey work conducted at Yarmouth Pier from 2017-2019 during a phase of reconstruction of the pier head. Data from the pier was mostly collected by volunteer Seasearch SCUBA divers and the deployment of Baited Remote Underwater Video (BRUV) from the pier head. Reference sites to the east and west of the pier were also sampled using BRUV to determine whether observed changes in species abundance were confined to the pier or could be generally attributed to the wider locality. A total of 140 species were recorded on the pier structure and seabed immediately below the pier and an additional 5 species were recorded from the Reference sites. BRUV surveys yielded more species from the pier than the Reference sites. During spring and summer 2018, recolonisation of the new pier piles was rapid and included pioneer benthic species not seen in the previous summer. Yet although the mobile fish assemblage differed from that prior to reconstruction of the pier head, this could be attributed to background variation. The pier is clearly attractive to invertebrates and a range of reef fish, including species of wrasse, pout, pollack and bass that individually benefit from the structure in different ways.*

## Introduction

Piers are emblematic of seaside towns and resorts and offer unique perspectives and access over the water for visitors. On the Isle of Wight there are currently three accessible piers; Yarmouth, Sandown and Ryde, however in the 19th Century, large piers were also constructed at Cowes, Totland, Seaview, Ventnor and Shanklin, with the latter meeting its demise during the 1987 storm. Although popular with sea anglers, very little information exists on the marine ecology of piers, and what has been published is concerned mostly with benthic invertebrates and algae that foul pilings (Glasby, 1999, 2000; Connell and Glasby, 1999). The extent to which piers attract fish and other mobile species is much less known, partly because of the hazards associated with SCUBA diving around these structures, which may be subject to strong tidal conditions. It is known that pier pilings provide a surface for attachment of benthic organisms which may be a source of food for fish and other species (Clynick et al. 2007). The pilings can also be a refuge in strong tidal conditions and bass *(Dicentrarchus labrax)* are known to hide downstream in the slower flowing water behind pilings to ambush prey (Pickett and Pawson, 1994). Depending on aspect, pier decking and pilings might cast significant shade that might both attract and deter species. Lights on piers may also be attractive to some organisms at night. An important question is the extent to which the pier structure affords protection and/or food. Fish are known to aggregate around natural rocky reefs, wrecks and other artificial structures (Bohnsack, 1989, Pickering and Whitmarsh, 1997, Reubens et al. 2013), yet it is often unclear how they are benefiting from the habitat (Coleman and Connell, 2001; Clynick et al. 2007).

The marine environment is particularly harsh and all structures at sea require periodic maintenance. This can create opportunity to investigate species habitat preferences as when new structures are immersed, the habitat is disturbed and it can take some time before a mature benthic community becomes re-established. Species that rely on the benthic organisms for food may therefore not reappear immediately following the disturbance. Yet species that are seeking refuge from the structure itself may recolonise more quickly.

The aim of this investigation was to characterise the marine flora and fauna associated with Yarmouth Pier before and after reconstruction of the pier head in 2018. Surveys of marine life on the old wooden pier piles, together with associated fish and mobile invertebrate species commenced in summer 2017, prior to the main works the following spring. These surveys were repeated in summer 2018 and 2019 to determine whether any changes in the marine fauna and flora could be attributed to the reconstruction.

## Yarmouth Pier

Yarmouth Pier is situated on the north-west coast of the Isle of Wight in the south of England and extends 186m into the Solent (Fig. 1). Immediately west of the pier is the Yar estuary and Yarmouth Harbour, which serves recreational craft and a small ferry port. The pier was opened in 1876 and has always been constructed from timber. Owing to attack from the wood boring isopod *Limnoria lignorum*, it has frequently been necessary to replace and refurbish the structure; yet because of the pier's Grade II listed heritage status, new works have always used wood. Prior to the current phase of restoration, work was carried out in 2007-8 when 54 support piles were replaced with greenheart timber along the length of the pier, but not on the pier head. Species recorded on a stack of five piles that had been removed is presented in Herbert (2009). In February 2018, work commenced to dismantle and fully reconstruct the pier head with refurbished greenheart timbers from Portsmouth dockyard and was completed in June 2018. The new pier head is very similar to the previous structure although a steel tube 'shoe' has been driven in to the sea bed to replace the wood 0.7m below low water springs. Vertical pilings are square in cross section and of side approximately 40cm. Most

new diagonal cross members have been positioned similarly to the previous design and there are some horizontal timbers above and below Low Water Spring tide mark. The pier is used mainly for pedestrians and currently receives only occasional summer berthing by passenger vessels, such as the PS Waverley, on the outside of the pier head.

The north-west coast of the Isle of Wight is relatively sheltered from prevailing south-westerly winds and the surrounding seabed consists mostly of soft sediments and gravels, beds of seagrass *(Zostera marina)* and patches of limestone and clay reef. Mean maximum sea temperature is 18°C and minimum 7.5°C. The tidal range is small – at 3m on spring tides and 2m on neap tides, however the west-east bidirectional flow is particularly strong on the spring ebb (west-going) tides and can exceed 3m/s. The area is part of Solent Maritime SAC and protected under the EU Habitats Directive. The Yarmouth-Cowes Marine Conservation Zone boundary is immediately east of the pier.

## Methods

*Seasearch SCUBA diving surveys*

Dive surveys beneath the pier using SCUBA took place on August 1st and August 31st 2017 from *Wight Spirit* and on August 7th 2018 and August 27th 2019 from *Rocket*. The objective of the dives was to characterise and photograph the fauna and flora of the sea bed and the pier piles. Each survey lasted approximately 1 hour around slack water during neap tides when the water depth recorded about 3.7-3.9m, and was conducted by 3 pairs of divers in 2017 and 2019 and 2 pairs of divers in 2018. Species abundance followed Seasearch surveyor guidance http://www.seasearch.org.uk/downloads/Survformguide%202-14.pdf.

*BRUV surveys*

During the summers of 2017, 2018 and 2019, a Baited Remote Underwater Video (BRUV) unit was deployed from the pier head to survey and record mobile fauna. This technique is becoming more widely used for surveying subtidal mobile fauna where SCUBA surveys are difficult or where non-destructive methods are necessary (Unsworth et al. 2014; Whitmarsh et al. 2017; Jones et al. 2021). The unit consisted of a weighted aluminium frame and *GoPro* Hero 3 camera with underwater housing. A 1m pole extends in front of the camera at the end of which is a bait cage filled with 100g of chopped fresh mackerel. To compare changes in mobile underwater life around the pier with the surrounding habitats, a Reference Site to the east (mooring of RSYC Committee Boat *Countdown*) and west (Yarmouth Harbour Master mooring buoy S1) of the pier were also surveyed (Fig. 1). These sites are at a similar depth (2-3m below Chart Datum) to the sampling site at the pier head. Due to ongoing construction works and access difficulties, pier deployments in June 2018 were from the Mackley's barge stationed at the pier head. In each month, ten deployments were made over two sampling periods of 2-3 days with varying tidal conditions. Details of deployments are shown in Table 1.

To investigate changes in mobile assemblages into the hours of darkness a mono-BRUV unit fitted with a single SEAC R3 LED Dive Torch (500 Lumens) was deployed from the pier head. Surveys were carried out from 10:00 hrs - 00:00 midnight (14 hours total) during two neap tides (23rd, 24th August) and two spring tides (29th, 30th August). Deployments were for 20 mins on each hour.

The video footage from each BRUV deployment was analysed in 1-minute sections using MS Media Player and the number of species seen (S) over each 20-minute

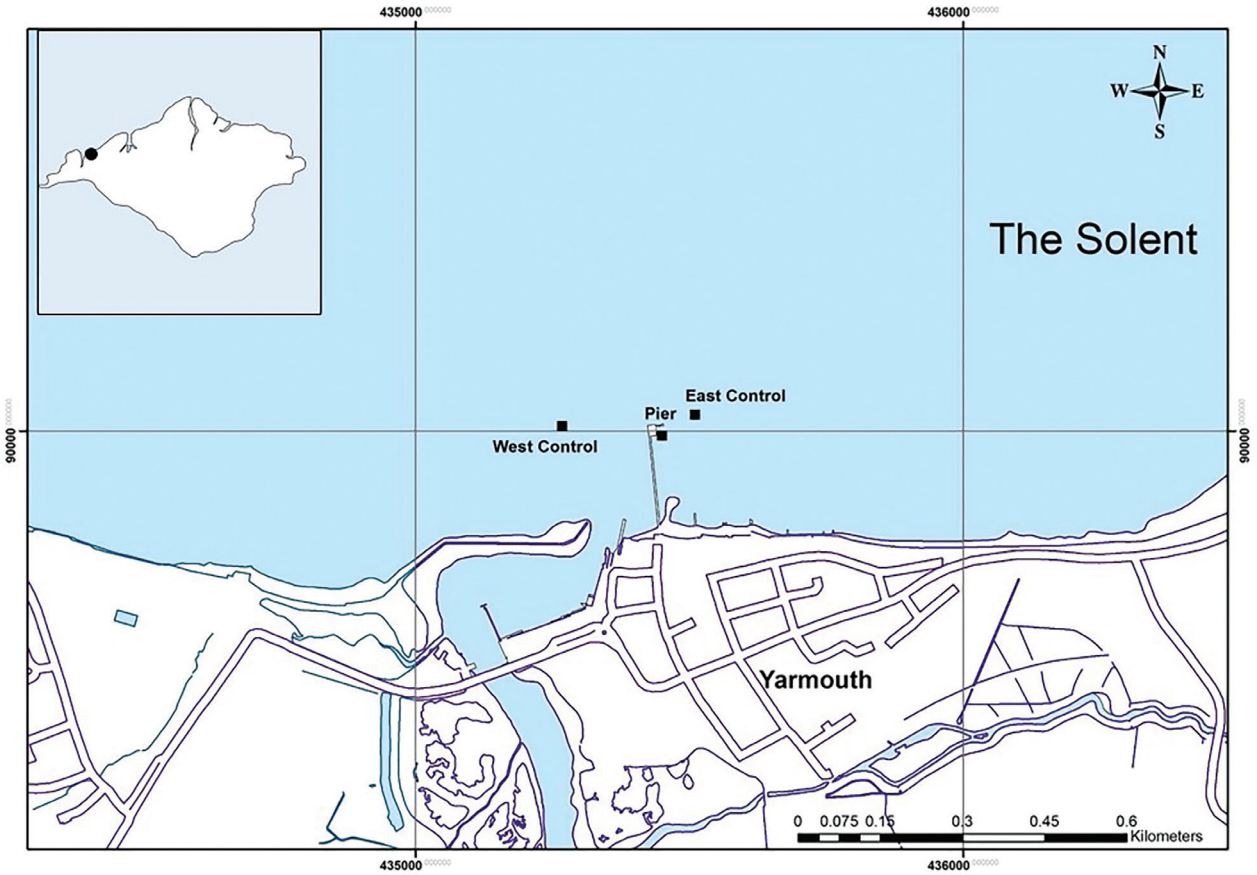


**Fig. 1:** Location of Yarmouth Pier on the north-west coast of the Isle of Wight and BRUV Reference sites east and west of the pier head. Crown copyright and database rights 2021 Ordnance survey (100025252).

deployment was recorded. Additionally, the maximum number of individuals of each species seen in any frame over the 20-minute deployment was also noted (Max N). The total Max N is the overall maximum number of individuals of all species observed in any one frame during the deployment.

*Video surveys of pier piles*

During a neap tide on October 14th 2017, video surveys of the benthic fauna and flora colonising the outer pier piles on the pier head were conducted using a *GoPro* Hero 3 camera fixed to the end of a 6m fishing pole lowered beside the piles. The pole was guided down the pile by a researcher in a kayak. The objective was to obtain data on the percentage coverage of main species groups on the pilings, which could be compared with coverage of new pilings in 2018.

*Current speed and water temperature*

Surface water temperature was measured beneath the pier using an alcohol thermometer at the steps prior to video surveys. At the same time, the current flow and direction was also measured using a hand-held meter. On the spring tide of August 14th 2018, a *StreamPro* Acoustic Doppler Current Profiler (ADCP) was deployed to measure current velocity throughout the water column and specifically to record the effect of the pier piles on current velocity. The ADCP was towed from a harbour dory along a 5m north-south transect up-tide and down-tide of pier head 2-3 hrs after High Water. With the tide ebbing fast, the Harbour Dory was tied to the pier legs and the ADCP towed along the length of the boat approximately 3m downstream of the pier.

**Results**

*Sea temperature and visibility*

In 2017, sea temperatures rose during the summer survey period from 17°C in June to 20°C in August. BRUV survey days had mostly good water visibility (2-3m) and fine weather with moderate SW winds.

In 2018, sea temperatures were slightly higher and increased from 17°C in June to 20°C in August. BRUV survey days were generally sunny and warm throughout the summer with light-moderate southerly winds. Water visibility was poor in June (<1m) due to algal bloom, but improved to 2-5m in August. During surveys in August 2019, maximum sea temperatures recorded were 22.4°C, reducing to 18.5°C by late evening. Survey days had poor – moderate water visibility (1-3m) and fine settled weather.

*Current flow*

In 2017, at the pier and west control site, an equal number of hand-held deployments were made during west and east flowing tides and spring and neap cycles, however at the eastern site 92% were made during east flowing currents due to operational constraints. The mean current velocity during BRUV deployments at the two control sites did not differ significantly (west 0.35 m/s; east 0.38 m/s – approx. 0.7 knots) (Fig. 2). The mean current velocity at the pier survey site was significantly less than the control sites (0.05 m/s = 0.1 knot), due to shelter from the pilings. In 2018, an equal number of deployments were made on spring and neap cycles. At the western control site, an equal number of deployments were made on both east flowing and west flowing tides, however at the pier and eastern site the majority were made on east flowing tides. As in 2017, the mean current velocity at the two control sites was greater than at the pier (west 0.31 m/s; east 0.26 m/s; pier 0.09 m/s) (Fig. 3).

The ADCP survey in August 2018 showed the impact of the pier piles in reducing mean current velocity in the water column from 0.63 m/s upstream to 0.36 m/s (Fig.3).

The number of species observed monthly from BRUV surveys at each site generally increased during the summer, reaching a maximum at the pier in August (Fig.4). The mean *MaxN* was also highest at the pier during most survey months except in August 2018 when large numbers of juvenile black bream (*Spondyliosoma cantharus*) were seen at the western control site (Fig. 5).

2017 survey

In 2017, the distribution of species on the old piles was zoned strongly with depth, with the yellow maritime sunburst lichen (*Xanthoria parietina*) present above the extreme high water mark.

Green seaweeds (*Ulva* spp.) occupied the highest of the algal zones, below which were found the brown wracks e.g. bladder wrack (*Fucus vesiculosus*) and occasional patches of knotted wrack (*Ascophyllum nodosum*). Descending further, a narrow and occasionally dense band of barnacles (*Semibalanus balanoides* mixed with (*Austrominius modestus*)) was present with occasional

| Year | Dates | West Control | Pier Head | East Control | Total video minutes |
|---|---|---|---|---|---|
| **2017** | June 22nd, 29th, 30th | 10 | 10 | 6 | 480 |
| | July 19th, 20th, 26th, 27th | 10 | 10 | 10 | 600 |
| | August 16th, 17th, 28th, 29th | 10 | 10 | 10 | 600 |
| **2018** | June 15th, 16th | 10 | 10 | 10 | 553 |
| | July 20th, 23rd, 30th | 10 | 10 | 10 | 635 |
| | August 5th, 6th, 19th, 20th | 10 | 10 | 10 | 605 |

**Table 1:** Dates, number of BRUV deployments and total minutes of video obtained at each sampling site during June, July and August 2017 and 2018. All deployments were made during daylight from 09:00-17:00 DST. (Daylight Saving Time).

limpets (*Patella vulgata*). At extreme low tide mark, red seaweeds *Halurus flosculosus* and *Calliblepharis ciliata* became more prominent, with sponge *Halichondria panicea*, and bryozoans *Flustra foliacea* and *Chartella papyacea* more common towards the base of the piles.

Surveys of the pier in summer 2017 yielded a total of 102 species, including 43 seaweeds, 58 species of invertebrates and fish and the seagrass *Zostera marina* (Appendix 1). All species were found either on the old piles and cross members, swimming or on

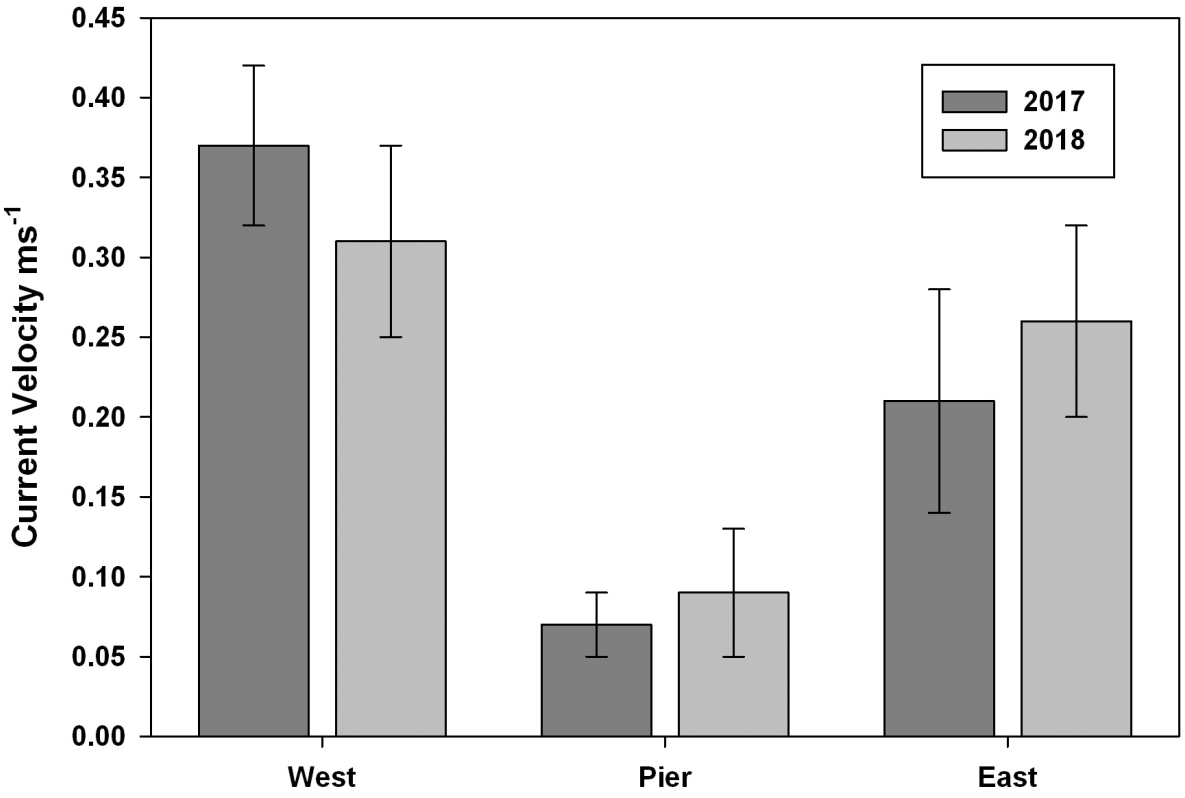


**Fig 2:** Mean current velocity during BRUV surveys measured using hand-held meter at each sampling location in 2017 and 2018. Samples ranged n = 4-10 in June, July and August. Error bars show +/- SE.

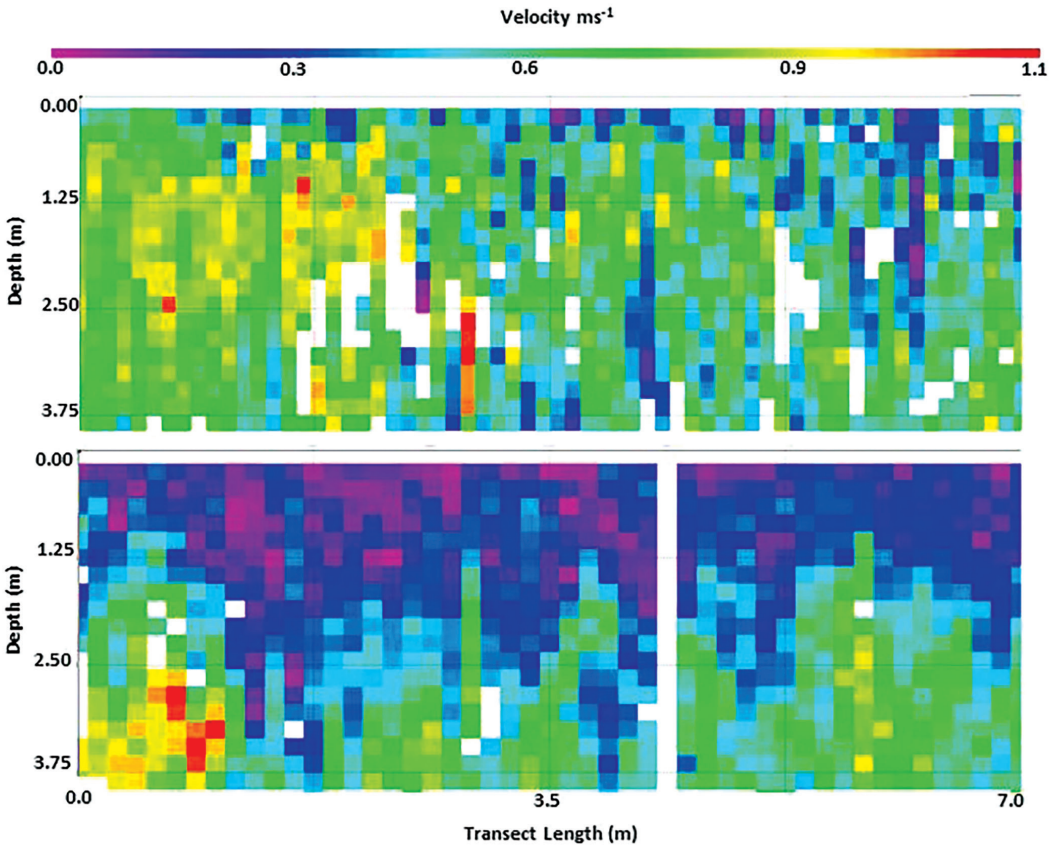


**Fig 3:** Mean current flow patterns along 7.0m (North-South) transect upstream (above) and downstream (below) of the pier obtained using ADCP 2-3 hrs after HW on 14th August 2018. Vertical axis on each image is water depth from surface to sea bed. The blue represents slow flowing water behind the horizontal wooden cross members and pier piles.

the sea bed within 2m of the structure. Colonising the pier structure were nine species of algae, including common red seaweeds *Aglaothamnion tenuissimum, Halurus flosculosus* and *Calliblepharis ciliata* and brown algae *Halydris siliquosa*. Occasional plants of the kelp *Sacchorhiza polyschides* was recorded towards the base of the structure. Of the macroinvertebrates associated with the pilings, the most common and obvious fouling species were the bryozoans *F. foliacea C. papyacea* and sponge *H. panicea*. The barnacle *Perforatus perforatus* was frequent in patches at lower intertidal levels and mid subtidal depths. Of the 15 species of fish observed, pollack (*Pollachius pollachius*), pout (*Trisopterus luscus*), corkwing wrasse (*Crenilabrus melops*) and sand smelt (*Atherina sp.*) were most numerous. Edible crab (*Cancer pagurus*) (Fig.6), velvet swimming crab (*Necora puber*) and spider crabs (*Maja brachydactyla*) and *Inachus* sp. were seen on the sea bed around the piles. In addition, the native oyster (*Ostrea edulis*) was recorded at several locations on the seabed in proximity to the pier pilings. One of the most spectacular species observed was the cuttlefish (*Sepia officinalis*) (Fig 7.) at the pier head. The seagrass *Zostera marina* was seen in small clumps 1.5-2.0m east of the mid- section of the pier, but not beneath the structure itself.

A total of 23 mobile species were identified from BRUV videos obtained at the three sampling sites (Appendix 2). These comprised six species of crab and lobster, three molluscs and fourteen fish species, including bib, pollack (Figs. 8 and 9), and different species of wrasse. Of the three sampling sites, the pier had the greatest variety of species (19 species) (Fig. 4).

2018 survey

A total of 55 species/taxa were recorded by *Seasearch* either on the new piles or swimming in proximity and/or on the seabed within 2m of the pier (Appendix 1). This represents just over half the total number of species seen in 2017, yet, 20 of these species had not been recorded the previous year. Some of these species, particularly the sea squirts *Ciona intestinalis* and *Ascidiella aspersa* can be early pioneering colonists.

Early stage community development was observed on the exposed steel sections including low densities of barnacles (*Balanus crenatus*), slipper limpet (*Crepidula fornicata*), keel worm (*Spirobranchus* sp.) and a uniform belt of mixed filamentous and foliose red algae with *Ulva* sp.

Of particular interest regionally was the first Isle of Wight and Solent record of the cushion starfish (*Asterina phylactica*). Sea squirts (*Ciona intestinalis* and *Ascidiella aspersa*) and bryozoans were present in low abundance; however, overall zonation on the piles was weak. The sand and gravel seabed around the base of the pilings was scoured by the strong currents, with exposed blue clay, debris and some aggregates that had fallen in to the scour pit. The dish around the piles may also have been caused by liquefaction of the substrate during pile driving, allowing for some erosion followed by silt infill from surrounding sediments.

Although access to the pier deck was not possible during construction, by May and June 2018, green algae (*Ulva* sp.) were visible in upper intertidal sections of the new wooden piles. A light-moderate, yet patchy settlement of the barnacle *Semibalanus balanoides* was also observed in June.

In July and August, spectacular numbers of bass were observed gaining shelter from piles during strong ebb flows on spring tides, (Fig. 9). The bass, along with large numbers of black-headed gulls, herring gulls and some

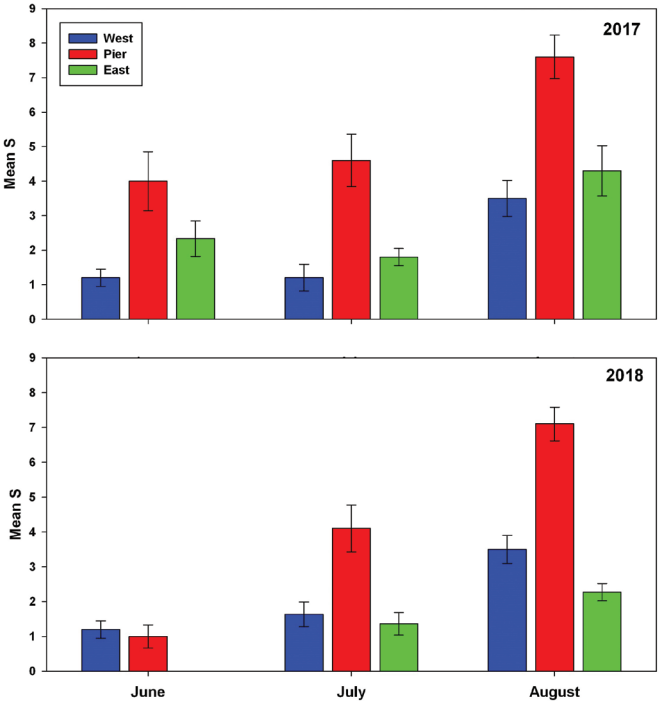


**Fig 4:** Mean species richness (S) of mobile fauna per 20 min deployment calculated from BRUV footage obtained at each sampling site in June, July and August 2017 and 2018 (there were no species recorded at the eastern control site in June 2018). Error bars show +/- SE.

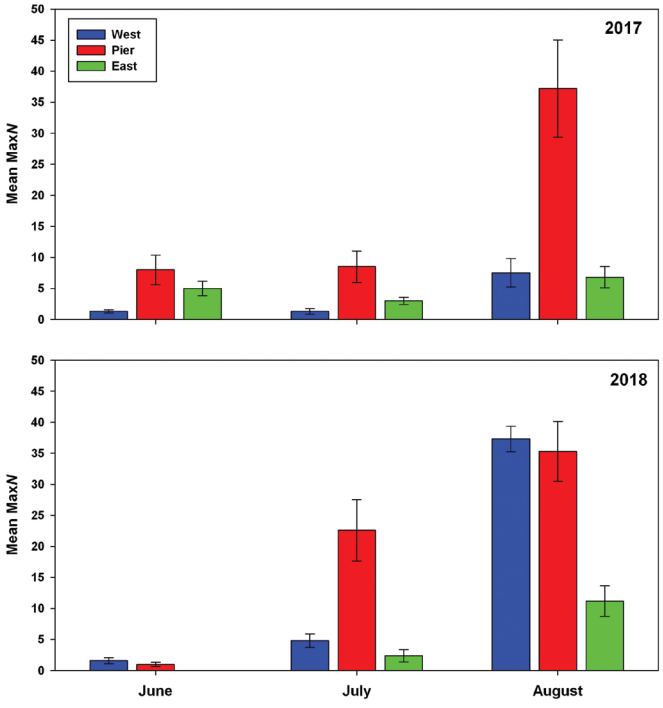


**Fig 5:** Mean *MaxN* (Mean maximum total No. of individuals of mobile fauna seen in 20 min deployment) calculated from video footage obtained at each sampling site in June, July and August 2017 and 2018. Error bars show +/- SE.

**Fig 6:** Edible crab (*Cancer pagurus*) at base of piles.
Photo A. Hall

**Fig 7:** Cuttlefish (*Sepia officinalis*) at the pier head.
Photo A. Hall

**Fig 8:** Pollack (*Pollachius pollachius*) and Bass (*Dicentrarchus labrax*) beneath the pier in September 2016. In the foreground is the bryozoan *Flustra folicaea* and colonial sea squirt *Botryllus schlosseri*.
Photo: A. Hall

**Fig 9:** Bass beneath the pier in September 2019.
Photo R.J.H. Herbert

common and sandwich terns, engaged in a feeding frenzy when shoals of bait fish were swept through the pier. In June and July, common terns that had captured prey in proximity to the pier were observed flying north across the Solent towards the Beaulieu River, where there is a small breeding colony

In 2017 and 2018, numbers of bass, pollack, corkwing wrasse and ballan wrasse were typically greater around the pier (Figs. 10 and 11).

Following replacement of piles at the pier head, a total of 29 mobile species were recorded from BRUV videos across the three sites (Appendix 2). These comprised four species not seen in 2017, including spurdog (*Squalus acanthias*), common smoothound (*Mustelus mustelus*), painted goby (*Pomatoschistus pictus*) and European anchovy (*Engraulis encrasicolus*). Again, the pier had the greatest variety of species recorded (19 species).

2019 survey

In total, *Seasearch* divers recorded fifteen species of seaweeds and twenty species of benthic and mobile fauna, including shanny (*Lipophrys pholis*), which was not found in 2017-2018 (Appendix 1). Three non-native species recorded; the Korean sea squirt (*Steyela clava*), wireweed (*Sargassum muticum*) and the cold-temperate circumpolar sea squirt (*Corella euymota*), which is previously unrecorded from Yarmouth.

The BRUV surveys yielded a total of 17 species of mobile fauna including five invertebrates. Four species of wrasse were observed, with corkwing being almost ubiquitous although never numerous. Bass were less frequent than in August 2018, yet pollack were more visible during hours of darkness and appeared to be attracted towards the torchlight, as were cuttlefish and red mullet. Species richness and abundance fluctuated significantly over both neap and spring tidal cycles. On the two neap tide days, species richness and abundance appeared to coincide with periods of higher current flow between low and high water; however this was less clear on spring tides. Sand smelt (*Atherina* sp.) were mainly observed during the flood tides and were most numerous during the neap tide flood on 23rd August. Conversely, bass were most prominent immediately after High Water on spring tides and present on the first part of the ebb (Fig.12).

At midnight, during a neap tide on 23rd August a mantis shrimp (*Rissoides desmaresti*) swam across the bait pole and disappeared down a burrow.

**Discussion**

There is no doubt the pier offers habitat to a relatively large number invertebrates and fish, which would otherwise either not be present at all, or be in much smaller numbers. The environment created by the pier is complex, and attributing benefits of the structure to specific mobile species is difficult. Yet the replacement of the pier head with new pilings offered a rare opportunity to examine this more closely. During the summer of 2018, the fauna and flora on the new pilings was not as diverse as that recorded on the older piles in 2017, although the coverage of green *Ulva* sp. and the red alga *Ceramium* sp. was already surprisingly high. Yet there was very little evidence for reduced abundance and diversity of associated mobile species in 2018 as a consequence.

Differences observed could equally be attributed to natural variation in populations, which is commonly seen in these habitats. Individual species will have 'good' and 'poor' years depending on variation in recruitment and survival. In both years, much of the species mobile assemblage was not unlike a shallow subtidal rocky reef, where a variety of species dominated by wrasse,

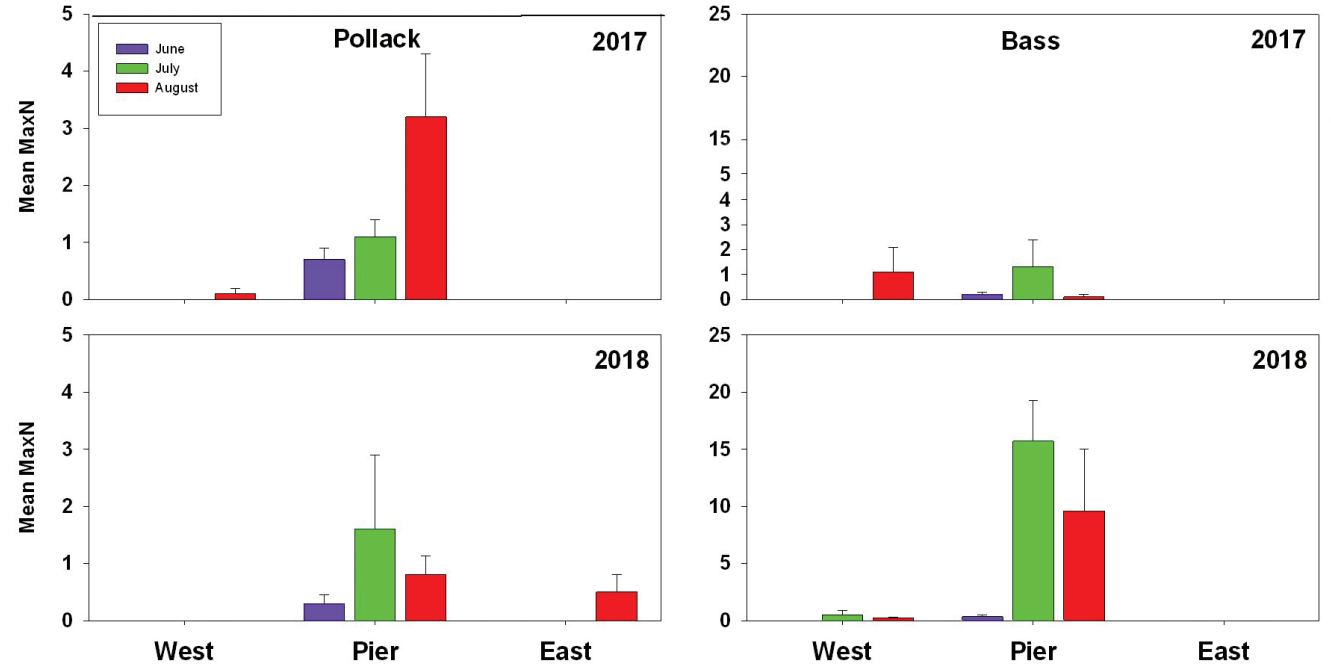


**Fig 10:** Mean *MaxN* pollack and bass recorded in 2017 and 2018. Values calculated from BRUV footage obtained at each sampling site in June, July and August 2017 and 2018. Note difference in axis scale for bass. Error bars show +/- SE.

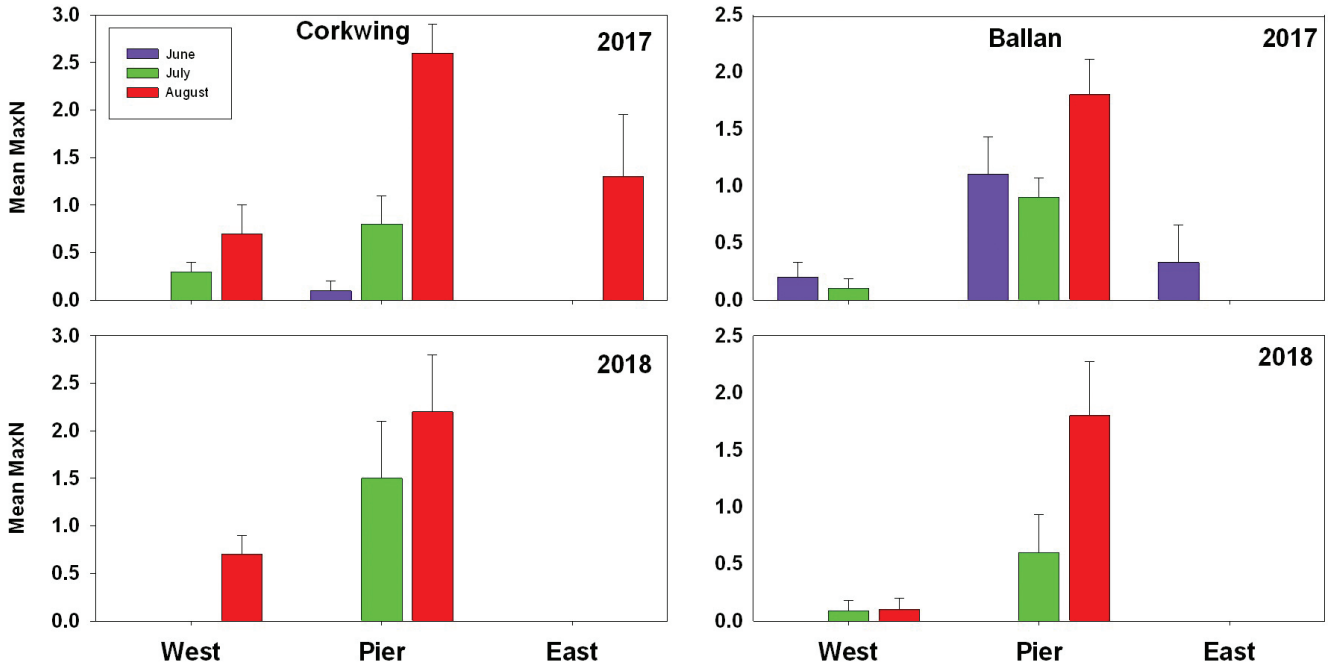


**Fig 11:** Mean *MaxN* corkwing wrasse and ballan wrasse recorded in 2017 and 2018. Values calculated from BRUV footage obtained at each sampling site in June, July and August 2017 and 2018. Error bars show +/- SE.

pouting and gobies, are also likely to be prevalent. The protection and shelter afforded by the piles might mimic boulders and overhangs in natural habitats, enabling species to gain shelter from strong currents, ambush prey and hide from predators. Planktivorous sand smelt appeared to benefit from moderate current flow beneath the pier, yet they were much less common on the ebb flowing tides than on the flood. It is possible this may relate to an inability to stem the faster current, or because of greater predation risk from bass and pollack which arrive at high water and can be dominant beneath the pier during the ebb.

As with natural habitats, some species may forage directly on the seabed. When viewing from the pier steps at low slack water, there were occasional observations of corkwing wrasse foraging on pile fouling. The seabed beneath the pier is different to the control sites, and consists of larger cobbles which may have rolled down with the tide and become trapped amongst the structure. There are broken sections of former piles and a whole array of items dropped by pier visitors, including mobile phones! This adds structural complexity to the seabed and provides habitat for crabs and smaller benthic algae and animals which are prey for larger species. Although there was localised disturbance of this habitat during re-construction, this appears not to have negatively affected the mobile fauna.

That bass arrived in considerable numbers in 2018 would indicate that it is shelter provided by the structure,

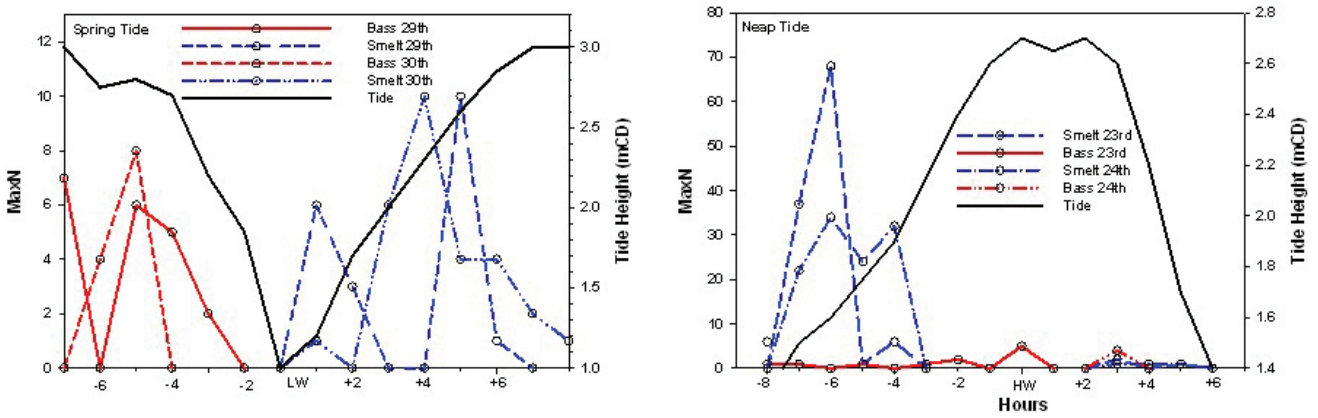


**Fig 12:** Changes in abundance (*MaxN*) of sand smelt and bass over spring and neap tide cycles. X-axis is hours before and after Low or High Water. Note different y-axis scales.

August 23rd Low Water 09:31 and 22:01; High Water at 17:06. Sunrise 06:04, Sunset at 20:10.
August 24th Low Water at 10:26 and 23:06; High water at 18:13. Sunrise at 06:06, Sunset at 20:07.
August 29th High Water at 10:35 and 22:45, Low Water at 16:20. Sunrise at 06:13, Sunset at 19:57.
August 30th High Water at 11:11 and 23:20; Low Water at 17:08. Sunrise 06:15, Sunset 19:55. All times DST.

and not the colonising benthos, which is of principal importance for this species. The pier's unique location and provision of shelter, in a region of particularly strong tidal currents, is important. The combined biological and hydrodynamic conditions created by the pier structure have established a beneficial feeding area for species of conservation importance.

Over the three years 2017-2019, a total of 135 different species taxa were recorded either on the pier structure or in immediate proximity in the water column or sea bed. Additionally, the lobster (*Hommarus gammarus*), hermit crab (*Paguridae* sp.) and spurdog (*Squalus acanthias*) was recorded at the BRUV control site to the east of the pier (RSYC mooring) and the scallop (*Pecten maximus*) to the west (YHC mooring). For such a small narrow transect, this is particularly notable and is one of the most detailed surveys of its kind (Intertidal, SCUBA and BRUV) undertaken in the Solent. The observation of the cushion star (*Asterina phylactica*) by *Seasearch* divers beneath the pier in August 2018 was of particular interest. This appears to be a new record for the Solent region and a significant range expansion east in the Channel. The native oyster (*Ostrea edulis*), a Species of Principal Importance (NERC Act 2006 Section 41), was recorded in both years on the seabed beneath the structure.

The discovery of the mantis shrimp (*Rissoides desmaresti*) in 2019 is, to the best of knowledge, the first record of active swimming behaviour 'in situ' around the English coast. The species has been recorded and photographed by divers in North Wales (Ramsay & Holt, 2001) and one specimen was seen beneath a rock in an intertidal pool at Bembridge in September 2011 (Herbert: personal records). Many have been dredged up as by-catch from oyster fishermen over the years (Herbert *et al.* 2011; Griffin *et al.* 2012). One specimen was caught by an angler at Yarmouth Pier in July 2012 using sand-eel as bait (Herbert: personal records). The species remains uncommonly recorded in the British Isles; however, its cryptic behaviour may disguise a much more widespread distribution.

## Future work

The overall impression is that the life beneath the pier is rich and interesting and a habitat worthy of continued investigation. More research should be carried out on the diverse range of habitats in proximity to the pier and harbour entrance, including the seagrass beds and cobble beach beside Gossips café. Yarmouth is an ideal site to create a marine observatory due to the unique access provided for the general public; there are very few places in the Solent where one can 'walk over the water' and observe the strength of the ebbing spring tide below. The survey work was of great interest to the many visitors strolling along the pier and the new interpretation in the Round House is a great asset. A short video *Pier Beneath*, to be shown in the newly refurbished Round House, has been created from the BRUV footage obtained during the project.

## Acknowledgements

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**Appendix 1:** Species recorded within different habitats of Yarmouth Pier 2017-2019.

**Abundance:** S - Superabundant; A - Abundant; C - Common; F - Frequent; O - Occasional; R - Rare; P - Present
See text for further details and Seasearch surveyor guidance available at:
http://www.seasearch.org.uk/downloads/Survformguide%202-14.pdf

| | | 2017 | | | | | | | 2018 | 2019 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pile Sublittoral | | | Seabed | | | Pile Littoral | | New piles | Sea bed | Old piles |
| Group | Species | Inner | Mid | Outer | Inner | Mid | Outer | | | | | |
| Lichen | *Xanthoria parietina* | | | | | | | P | | | | |
| Algae | *Acrosorium ciliolatum* | | | | | O | P | | | | | |
| | *Aglaothamnion tenuissimum* | F | | | O | | | | | | | F |
| | *Apoglossum ruscifolium* | | | | | | | | | | | O |
| | *Ascophyllum nodosum* | | | | | | | P | | | | |
| | *Asparagopsis armata* | | | | | R | | | | | | |
| | *Bryopsis plumosa* | | | | P | | | | | | | |
| | *Calliblepharis ciliata* | | | C | O | F | C | | F | O | O | F |
| | *Callophyllis* sp. | | | | | | | | | | | F |
| | *Carradoriella elongata* | | | | | | | | A | | | |
| | *Ceramium nodulosum* | | | | | | | | A | | | |
| | *Ceramium secundatum* | | | | O | | | | | | | |
| | *Chaetomorpha* sp. | | | | | | | | O | | | |
| | *Chondria capillaris* | | | | O | | | | | | | |
| | *Chondria dasyphylla* | | | | | O | | | | | | |
| | *Chondrus crispus* | | | | | R | | | | | | |
| | *Cladophora sericea* | R | R | | R | R | | | | | | |
| | *Cladophora* sp. | | | | | | | | F | | | R |
| | *Cladostephus spongiosus* | | | | | O | | | | | | |
| | *Corallina officinalis* | | | | | | | | O | | | O |
| | Corallinacea sp. | | O | | F | | | | O | | | |
| | *Cryptopleura ramosa* | | | | O | O | O | | | | | O |

| | | 2017 | | | | | | | 2018 | 2019 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pile Sublittoral | | | Seabed | | | Pile Littoral | | New piles | Sea bed | Old piles |
| **Group** | **Species** | **Inner** | **Mid** | **Outer** | **Inner** | **Mid** | **Outer** | | | | | |
| **Algae *Continued*** | *Delesseria sanguinea* | | | | | R | | | | | | |
| | *Desmarestia ligulata* | | O | | | | | | | | | |
| | *Dictyota dichotoma* | | | | C | F | O | | F | O | | |
| | *Dictyota spiralis* | | | | R | | | | | | | |
| | *Fucus serratus* | | | | | R | | R | | | | |
| | *Fucus vesiculosus* | | | | | | | P | | | | |
| | *Furcellaria/Polyides* sp. | | | | | | | | R | | | |
| | *Gracilaria bursa-pastoris* | | | | O | | | | | | | |
| | *Gracilaria gracilis* | | | | F | O | O | | | | | |
| | Gracilaridae sp. | | | | | | | | F | | | |
| | *Grateloupia subpectinata* | | | | | | P | | | | | |
| | *Grateloupia turuturu* | | | | | | P | | | | | |
| | *Griffithsia corralinoides* | | | | | | | | P | | | |
| | *Halarachnion* sp. | | | | | | | | O | | | |
| | *Halidrys siliquosa* | | | C | | O | O | | | | | |
| | *Halopithys incurva* | | | | F | | | | | | | |
| | *Halurus equisetifolius* | | | | F | | R | | | | | C |
| | *Halurus flosculosus* | F | C | | F | | | | | | | C |
| | *Heterosiphonia plumosa* | | | O | O | F | O | | | O | | |
| | *Hypoglossum hypoglossoides* | | | | P | | | | P | | | |
| | *Laminaria digitata* | | | | O | O | | | | | | |
| | *Metacallophyllis laciniata* | | | | | O | | | | | | |
| | *Naccaria wiggii* | | | | | O | | | | | | |
| | *Osmundea* sp. | O | | | O | | | | | | | |
| | *Palmaria palmata* | | | | | | | | O | | | F |
| | *Plocamium cartilagineum* | | | | O | | | | | | | |
| | *Plocamium* sp. | | | | | O | O | | F | | | |
| | Red crusts (on shell) | | | | | | P | | | | | |
| | *Rhodymenia holmesii* | | | | R | | | | | | | |
| | *Saccharina latissima* | | | | R | O | F | | R | | | |
| | *Saccorhiza polyschides* | R | R | | | | | | | | | |
| | *Sargassum muticum* | | | O | C | O | F | | O | O | | |
| | *Symphocladiella parasitica* | | | | R | | | | | | | |
| | *Ulva lactuca* | | | | O | | | | | | | |
| | *Ulva* sp. | | | | F | O | O | P | | | | C |
| | *Vertebrata byssoides* | | P | | | | | | | | | |
| **Plants** | *Zostera marina* | | | | | O | | | R | | | |
| **Porifera** | *Amphilectus fucorum* | | R | | | | | | | | | P |
| | *Cliona celata* | | R | | | | | | | | | |
| | *Dysidea fragilis* | O | O | | | | | | O | | | |
| | *Halichondria panicea* | | O | | | | | | | F | | C |
| | ? *Hymeniacidon perlevis* | | | | | | | | R | | | |
| | Porifera crusts | O | | O | R | | | | | | | P |
| | *Sycon ciliatum* | | | | | | | | R | | | |
| **Cnidarians** | *Aglaophenia* sp. | | | | | | | | O | | | |
| | *Anemonia viridis* | | | | | | | | P | | | |
| | *Sertularella* cf. *rugosa* | | | | | | P | | | | | |
| | *Hydrallmania falcata* | | | | R | R | | | R | | | |
| | Hydrozoa sp. | | | | | | | | C/O | | | |
| **Annelids** | *Spirobranchus triqueter* | | | | O | | | | | F | | |
| **Crustacea** | *Austrominius modestus* | F | | | | | | P | | | | |
| | *Balanus crenatus* | | | | | | | | O | | | |
| | *Cancer pagurus* | | | | | | R | | | | | |
| | *Carcinus maenas* | | | | R | | | | | | | |
| | Cirripedia | | | | O | | | | | | | |
| | *Inachus* sp. | | | | | | P | | | | | |
| | *Ligia oceanica* | | | | | | | P | | | | |
| | *Maja brachydactyla* | | | | R | | O | | | | | |
| | *Necora puber* | | | | O | O | O | | O | | C | |
| | *Perforatus perforatus* | | | | | | | P | | | | |
| **Molluscs** | *Semibalanus balanoides* | | | | | | | P | O | | | |
| | *Calliostoma zizyphinum* | | | | | | | | R | O | | |
| | *Crepidula fornicata* | | | | O | O | O | | | | | |
| | *Littorina littorea* | | | | | | | P | | | | |
| | *Littorina saxatilis* | | | | | | | P | | | | |

| | | 2017 | | | | | | | 2018 | 2019 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pile Sublittoral | | | Seabed | | | Pile Littoral | | New piles | Sea bed | Old piles |
| Group | Species | Inner | Mid | Outer | Inner | Mid | Outer | | | | | |
| Molluscs *Continued* | *Nucella lapillus* | | | | R | | | P | | | | |
| | *Ocenebra erinaceus* | | | | O | | | | | | | |
| | *Ostrea edulis* | | | | O | O | O | | | | | |
| | Rissooidea sp. | | | | | | | | F | | | |
| | *Patella vulgata* | | | O | | | | P | | | | |
| | *Sepia officinalis* | | | | | | R | | | | | |
| | *Sepiola atlantica* | | | | | | P | | | | | |
| | *Steromphala* sp. | | | | R | R | | | | | | |
| | *Steromphala cineraria* | | | | | | | | O | | | |
| | *Steromphala umbilicalis* | | | | | | | P | | | | |
| | *Thecacera pennigera* | R | | | | | | | | | | |
| | *Tritia reticulata* | | | | | R | O | | | | | |
| Bryozoans | *Amathia lendigera* | C | | | P | | | | | | | |
| | *Bugula* sp. | | R | | | R | | | | | | |
| | *Chartella papyracea* | C | O | | | | | | | | | |
| | Crisiidae sp. | | | P | | | | | | | | |
| | *Electra pilosa* | O | | O | | | | | | | | |
| | *Flustra foliacea* | F | F | A | | | | | R | O | | |
| | *Obelia geniculata* | | | | | | O | | | | | |
| | *Parasmittina trispinosa* | R | | R | | | | | | | | |
| | *Scrupocellaria/Tricellaria* sp. | | | | C | | | | F | | | |
| Echinodermata | *Asterina phylactica* | | | | | | | | R | | | |
| Ascidians | *Ascidiella aspersa* | | | | | | | | O | | | O |
| | *Botryllus schlosseri* | | | | | | | | R | | | |
| | *Botrylloides leachii* | | | | | | | | | O | | |
| | *Botryllus schlosseri* | | | | R | | R | | | | | |
| | *Ciona intestinalis* | | | | | | | | R | | | |
| | *Clavelina lepadiformis* | | R | | | | | | | | | |
| | *Corella eumyota* | | | | | | | | | F | | |
| | *Dendrodoa grossularia* | | R | | R | | | | R | | | |
| | *Didemnum maculosum* | R | | | | | | | | | | |
| | *Diplosoma* cf.*listerianum* | | | | P | | | | | | | |
| | *Molgula* sp. | | | | | | | | O | | | |
| | *Polycarpa errans* | | | | | | | | F | | | |
| | *Styela clava* | | R | | | | | | | | | |
| Pisces | *Atherina* sp. (Sand smelt) | | | | | P | | | | | | |
| | *Callionymus* sp. (Dragonet) | | | | | R | | | | | | |
| | *Ctenolabrus rupestris* (Goldsinny wrasse) | | | | | | O | | | | | |
| | *Gobius* sp. (Goby) | | | | | R | | | | | | |
| | *Gobiusculus flavescens* (Two-spot goby) | | | | R | | | | | | | |
| | *Labrus bergylta* (Ballan wrasse) | O | | | | | | | O | | | |
| | *Lipophrys pholis* (Shanny) | | | | | | | | | O | | |
| | *Parablennius gattorugine* (Tompot blenny) | | | | | | | | R | | | |
| | *Pollachius pollachius* (Pollack) | O | | | | | A | | | | | |
| | *Pomatoschistus* sp. (Goby) | | | | | O | R | | O | | | |
| | *Pomatoschistus minutus* | | | | | | | | O | | | |
| | *Spondyliosoma cantharus* (Black bream) | | | | | | | | O | | | |
| | *Syngnathus acus* (Greater pipefish) | | | | | | | | R | | | |
| | *Symphodus melops* (Corkwing wrasse) | O | O | | | O | | | O | | | |
| | *Trisopterus luscus* (Bib) | | O | | | O | C | | | | | |

**Appendix 2:** Mobile species recorded using BRUV at each of the three survey sites in 2017, 2018 and 2019. Values are *MaxN* recorded with single BRUV unit and 20 minute soak time in June, July, August (2017, 2018) and August only in 2019.

| | | | 2017 | | | 2018 | | | 2019 |
|---|---|---|---|---|---|---|---|---|---|
| **Group** | **Common Name** | **Scientific Name** | **West Control** | **Pier** | **East Control** | **West Control** | **Pier** | **East Control** | **Pier** |
| **Cnidaria** | Moon jellyfish | *Aurelia aurata* | | | | 1 | 1 | | |
| **Crustacea** | Edible Crab | *Cancer pagurus* | 1 | 1 | 1 | | 1 | | 1 |
| | Green shore Crab | *Carcinus maenas* | | 1 | | | | | |
| | Hermit Crab | Paguridae sp. | | | 3 | 1 | | 1 | |
| | Lobster | *Hommarus gammarus* | | | 1 | | | 1 | |
| | Spider Crab | *Macropodia rostrata* | | | | 1 | | 1 | |
| | Spiny Spider Crab | *Maja brachydactyla* | 2 | 2 | 3 | 3 | 1 | 3 | 1 |
| | Velvet swimming crab | *Necora puber* | 2 | 2 | 1 | | 3 | | 3 |
| | Mantis shrimp | *Rissoides desmaresti* | | | | | | | 1 |
| **Mollusca** | Great Scallop | *Pecten maximus* | 1 | | | | | | |
| | Common Cuttlefish | *Sepia officinalis* | | | 1 | | | | 1 |
| | Netted Dog Welk | *Tritia reticulata* | 1 | | 7 | 1 | | 6 | |
| **Fish** | Sand smelt | *Atherina* sp. | 21 | 52 | | | | | 68 |
| | Golden grey mullet | *Chelon aurata* | | 1 | | | | | 1 |
| | Thin lipped mullet | *Chelon ramada* | | | | 1 | | | |
| | Corkwing Wrasse | *Symphodus melops* | 3 | 5 | 7 | 2 | 7 | | 4 |
| | Goldsinny wrasse | *Ctenolabrus rupestris* | 10 | | | | 3 | | |
| | Bass | *Dicentrarchus labrax* | | 11 | | 4 | 52 | | 6 |
| | Anchovy | *Engraulis encrasicolus* | | | | 195 | 421 | | |
| | Black Goby | *Gobius niger* | | 1 | 1 | 1 | | | |
| | Goby Two spot | *Gobiusculus flavescens* | | 1 | | | 2 | | 1 |
| | Ballan Wrasse | *Labrus bergylta* | 1 | 4 | 2 | 1 | 5 | | 2 |
| | Cuckoo wrasse | *Labrus mixtus* | | | | | 1 | | |
| | Red Mullet | *Mullus surmuletus* | | | | 2 | 2 | 3 | 1 |
| | Common smoothound | *Mustellus mustellus* | | | | | 1 | | |
| | Tompot Blenny | *Parablennius gattorugine* | | 2 | | | 1 | | 1 |
| | Pollack | *Pollachius pollachius* | 1 | 12 | | | 13 | | 4 |
| | Common goby | *Pomatoschistus microps* | | | 2 | 2 | 1 | | |
| | Sand Goby | *Pomatoschistus minutus* | 1 | 1 | | 3 | 1 | | |
| | Painted Goby | *Pomatoschistus pictus* | | | | | | 1 | |
| | Black bream (Adult) | *Spondyliosoma cantharus* | 2 | 4 | 6 | 3 | 3 | 21 | 7 |
| | Black bream (Juv) | *Spondyliosoma cantharus* | | | | 47 | 33 | 27 | |
| | Spurdog | *Squalus acanthias* | | | | | | 1 | |
| | Ballons Wrasse | *Symphodus bailloni* | | 1 | | | | | |
| | Gurnard sp. | Triglidae | | 1 | | | | 1 | |
| | Bib (pout) | *Trisopterus luscus* | | 29 | 1 | | 2 | | 8 |
| **TOTAL** | | | **12** | **18** | **13** | **16** | **20** | **11** | **16** |

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# BOHEMIA BOG: A BOTANICAL TREASURE

***Colin R. Pope***

Bohemia Bog is one of the Island's botanical jewels, lying about 1km to the southwest of Rookley. It is a tiny site, a seepage mire of just 0.6ha, situated on a north facing paddock of 5ha. Bohemia Bog is a fragmented relic in the landscape dating back to a time, two or three hundred years ago, when heathland formed a significant component of the landscape. It has been estimated that heathland landscapes accounted for just over 10% of the Island's land cover around 1600 (Chatters, 2021). I first visited on 31st July 1964 and was informed that it was a privilege to visit as it was a private site and visits were not encouraged. On later visits, I would ask for permission to visit from the elderly Mrs Vera Attrill who lived in a bungalow next to the farm and she was always obliging. Remarkably, little has been published about this very special site.

**Fig. 1:** The eastern end of Bohemia Bog, photographed in August 2017 showing the richest part of the site and gorse incursion. There are reddish-brown fruiting spikes of Bog Asphodel and, in the foreground, a surviving patch of Dwarf Gorse.

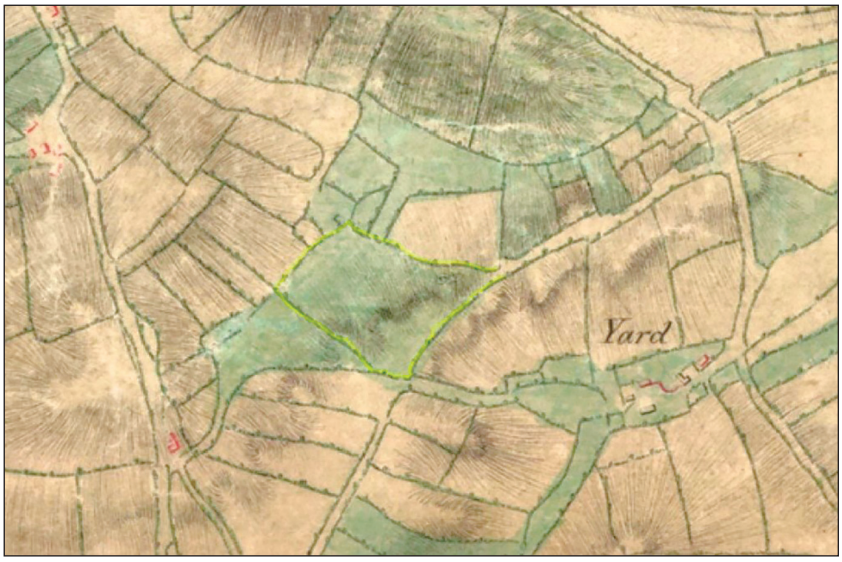
## The historical background

Historically, there were extensive heaths on the Lower Greensand. Bleak Down is a gravel-capped plateau which reaches 84.7m above OD on the watershed between the Medina and the Eastern Yar. It was listed in the Royal Survey of 1559 as 'a heath and furze of 200 acres pertaining to the manor of Rookley' and the absence of Old English place names in the vicinity correlates closely with the presence of terrain unsuitable for settlement or intensive agriculture (Basford, 2013). Dispersed settlements in the area may have exploited the landscape as an extensive grazing resource in the Middle Ages.

The Mudge map of 1793 shows fairly large areas of rough grazing still occupying the gravel ridge of Bleak Down, crossed by a network of unfenced trackways. Straight field boundaries shown on the 1793 map (Fig. 2a) suggest the enclosure of land from rough grazing or heathland at a fairly recent date, possibly 18th century (Basford, 2013). The 1793 coloured Mudge survey drawing shows extensive areas of open rough grazed land in and around Bohemia Bog (depicted as a green wash) reached by tracks with funnelled entrances, a characteristic of trackways as they pass onto greens or heaths. Around Bleak Down, roads seem to have developed from tracks along funnel entrances to the common (IWC, 2008). Also in the vicinity were Lake Common and Kennerley Heath.

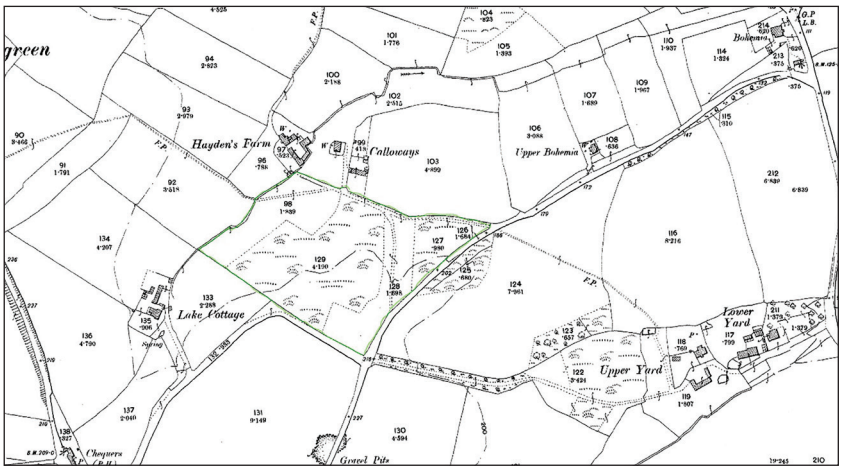
The 1862 OS map (Fig. 2b) indicates some reduction in the extent of rough grazing land but still shows an extensive area of rough grazing to the south-east of Bohemia Bog and an almost contiguous, larger Kennerley Heath. The 1898 OS map (Fig. 2c), however, shows a considerable fragmentation of this landscape with the 3.3ha land parcel containing Bohemia Bog as

**Fig. 2:** Bohemia Bog historic maps with Bohemia Bog is outlined in green.




**a:** 1793 Mudge Map shows Bohemia Bog as an area of open grazing land reached by tracks with funnel entrances.


**b:** 1862:1st edition O.S. map showing extent of rough grazing land.




**c:** 1898 O.S. map showing Bohemia Bog land parcel.

the last piece of rough grazing land. Even this land parcel is compartmentalised into two areas of rough grazing, totalling 59% of the land parcel set within better grazing land. These two areas depicted as rough grazing persist today, but the smaller, eastern area is now birch woodland whilst the larger area has become increasingly scrubbed over. Gradually, low-intensity rough grazing ceased to have a viable function in the 20th century landscape.

The nineteenth and twentieth centuries saw the gradual destruction of the Bleak Down heathland landscape by the piecemeal reclamation for agriculture and gravel extraction, followed by tipping and neglect. Some heathland survives on Bleak Down and it is currently being managed, but it lacks much of the diversity and species-richness which once occurred.

Gravel extraction was started in earnest in the early 20th century and several pits were dug to a depth of 2.5m. Up to 100 men were employed at one time and a tramway was laid down. In November 1931, the equipment to wash and grade chippings collapsed. Gradually, works were moved to St George's Down where there were deeper gravel deposits. By the 1960s, gravel extraction on Bleak Down had been abandoned and the site was used by the Rural District Council as a landfill refuse tip.

The gravel-capped plateau provides the catchment in which rainwater penetrates vertically and laterally through permeable soils in the superficial gravels, to emerge downslope of the terrace surface at the junction with clay beds of the Lower Greensand. There were weeping springs around the edge of Bleak Down on the terrace slopes, giving rise to an arcuate series of spring-line seepage mires which supported species-rich plant communities. The seepage mires once found around the slopes of the down have all been lost with the exception of Bohemia Bog which still survives today, surrounded by arable and pastoral agricultural land, as a refuge for true bog plants.

## The palaeoecological background

In 1980, Rob Scaife completed his PhD thesis entitled 'Late Devensian and Flandrian Palaeoecological Studies in the Isle of Wight'. Extensive fieldwork across the Island enabled identification of a number of sites where there were sufficient undamaged peat deposits to allow core samples to be taken to investigate the fossil pollen and plant seed record. These allow the study of

vegetation and environmental changes which have occurred since the end of the last Ice Age. Bohemia Bog proved to be a fruitful site for study, with a maximum of 96cm of peat remaining.

As a result of his studies, Scaife (2003) writes, 'It became apparent in recent years that, although of only very small extent, this remaining bog is an extremely important element of the Island's plant communities'. He found that a typical heathland environment was initiated in the middle to late Bronze Age. Most heathland seems to have developed during the middle Bronze Age and is often associated with clearance of Small-leaved Lime (*Tilia cordata*) woodland for agriculture. Certainly, Lime would have been the dominant woodland on the surrounding better-drained soil. From the initiation of the peat until 3,000 BP, this was a more base-rich habitat with some surrounding Alder (*Alnus glutinosa*), Willow (*Salix* sp) , Bog-myrtle (*Myrica gale*) and grass-sedge fen with Royal Fern (*Osmunda regalis*). More extensive woodland clearance and agriculture resulted in the extension of heathland and gorse scrub, which was accompanied by increased acidity and the formation of the bog moss (*Sphagnum* spp) community and associated taxa.

Scaife's studies have shown that many species or genera currently characteristic of the site have a respectable historic representation dating back to at least 1,000 BP, including Bog Asphodel (*Narthecium ossifragum*), Bog Pimpernel (*Anagallis tenella*) and Round-leaved Sundew (*Drosera rotundifolia*). In addition, the pollen record demonstrates the presence of a number of acidic wetland species that have not been recorded by visiting botanists. These include Bogbean (*Menyanthes trifoliata*), Oblong-leaved or Great Sundew (*Drosera intermedia* type), Marsh Pea (*Lathyrus palustris*) and Marsh Clubmoss (*Lycopodiella inundata*). The Sundews and Marsh Clubmoss require bare peat, generally created by livestock skirting around the edge of a bog along narrow trackways. There are also records of Meadow Saxifrage (*Saxifraga granulata*) and Adder's-tongue fern (*Ophioglossum vulgatum*) which are likely to have come from nearby grasslands. Scaife considered that the reduced area of Bohemia Bog and heath may have occurred only around the last hundred years and this correlates with map evidence.

**The discovery of Bohemia Bog as a botanical site**

There is no mention of Bohemia Bog in Dr William Bromfield's *Flora Vectensis* (1856), that remarkably extensively documented and exemplary Victorian county flora. Although there are a number of nineteenth century records of Wall Pennywort (*Umbilicus rupestris*) from Bohemia, these refer to the banks of the sunken lanes in the vicinity. Bohemia Bog also does not figure in the very worthy publications covering the Island's flora by Alexander Goodman More in 1858 or Frederick Townsend in 1883. At that time, Bleak Down and The Wilderness moors of the Medina provided rich and extensive areas for the botanist where almost all of the heath and bog plants found now at Bohemia Bog could be easily found in quantity.

The first specific reference to Bohemia Bog came in 1908, when E. W. Pollard made the remarkable discovery of Pale Butterwort (*Pinguicula lusitanica*). The find was reported by Frederick Stratton and published in the Journal of Botany in 1913. He wrote:

*It may be worth recording that* Pinguicula lusitanica *which I have long deemed extinct in the Isle of Wight has been found in a new locality, boggy ground near Bohemia (in Townsend's district iv (3)). This is some three miles east of the most easterly of the old Isle of Wight habitats, but the eastern limit of the plant in Hants is not extended, as Townsend records the plant as found at Purbrook, which is about nine miles further east than Bohemia.*

Evelyn Pollard (1877-1961) was an Isle of Wight pharmacist, and one of a gifted family (his elder brother was A.F. Pollard, the historian). He was a friend of, and much influenced by, John Milne, and set up observatories of his own equipped with Milne-type booms firstly on the Island, then, after his retirement, at Dorking, Surrey. He was also an amateur botanist and he recorded the precise locations of many rare Island plants on a series of maps now held at the IWNHAS office.

On 30th June 1917 and again on 20th June 1918, Bohemia Bog was visited by Rev. Douglas Montague Heath (1881-1961). He was a prolific botanist who searched botanical sites in the vicinity of his clerical appointments. He made a number of visits to the Island between 1910 and 1920, when he had a curacy in Sarisbury, between Portsmouth and Southampton. His extensive herbarium is housed at Birmingham University library. We know he visited Bohemia Bog, even though his herbarium sheets merely give 'Rookley' as the location, because he collected Pale Butterwort on both occasions. His herbarium notes make it clear that he also visited and collected material from The Wilderness on the first occasion, but not in 1918.

Bohemia Bog is a private site, for three generations in the ownership of the Attrills who lived at Calloway's Farm and the landowner was not keen to allow access. This may explain the paucity of botanical records from the site. Indeed, Bevis *et al* (1978) in their popular Botanical Calendar of botanically rich sites to visit on a monthly basis omit Bohemia Bog but include Bleak Down, The Wilderness, Cridmore and Munsley Bog. A few interesting sporadic records were made by visiting botanists but it was not until 1966 that the first comprehensive list was compiled and this was in connection with surveys for a proposed (but never completed) Hampshire and Isle of Wight Flora.

The eminent ecologist Francis Rose visited the site in the mid-1970s and he was the first person to draw attention to the special bryological interest of the site. The presence of peat-building bog mosses, *Sphagnum* spp. made possible the detailed palaeoecological studies by his PhD student, Rob Scaife, as previously described. There have been a series of detailed botanical surveys carried out by resident and visiting botanists over the past thirty years, including the British Bryological Society during their Isle of Wight Field Meeting in 2002. More recently, the site has attracted the interest of conservationists, keen to restore the degrading habitats.

**The botanical interest of Bohemia Bog**

Bohemia Bog site comprises a shallow, spring-line hanging bog situated partway up a north-facing slope. In the 1960s, the bog was dominated by *Sphagnum*

mosses with pools and wet hollows. The very wet acidic water flushed the adjoining flat areas to the west giving rise to a larger seepage area dominated by Common Cotton-grass (*Eriophorum angustifolium*) and Bog Asphodel. (Fig.3) The steep bank behind was dominated by Bracken (*Pteridium aquilinum*) and Gorse (*Ulex europaeus*) with some Dwarf Gorse (*Ulex minor*) and areas of birch woodland. The remainder of the land parcel was acid grassland. The site was grazed by cattle creating poaching and exposed peat enabling the smaller specialist plants, including insectivorous plants, to flourish. In many respects, the site resembled some of the New Forest lowland valley mires.

The bog comprised hummocks of *Sphagnum papillosum* and red *S. capillifolium* (Fig. 5) and pools with *S. cuspidatum,* (Fig. 6) *S. denticulatum* and Bog Pondweed (*Potamogeton polygonifolius*). The British Bryological Society recorded seven species of *Sphagna* during their visit on 15th March 2002 (Fig. 4) together with a number of tiny leafy liverworts growing amongst them (*Cephalozia connivens, C. macrostachya* var. *macrostachya* and *Kurzia pauciflora*), fascinating and beautiful species under a hand-lens. Additional leafy liverworts associated with *Sphagn*a were *Cladopodiella fluitans* found by Francis Rose on his visit in 1975 and *Odontoschisma sphagni* found by Sharon Pilkington on 4th March 2012. Other plants typical of the bog were Cross-leaved Heath (*Erica tetralix*), Common Heather (*Calluna vulgaris*), Bog Pimpernel, Marsh Pennywort (*Hydrocotyle vulgaris*), Lesser Skullcap (*Scutellaria minor*), Bulbous Rush (*Juncus bulbosus*) and various sedges.

The adjoining flushed mire had an abundance of Purple Moor-grass (*Molinia caerulea*) with Heath Spotted Orchid (*Dactylorhiza maculata*), Marsh Willowherb (*Epilobium palustre*), Ragged Robin (*Silene flos-cuculi*), Heath Milkwort (*Polygala serpyllifolia*) and Lousewort (*Pedicularis sylvatica*).

The adjoining birch wood also had some Aspen (*Populus tremula*) and Alder Buckthorn (*Frangula alnus*). Following ditch clearance alongside of the lane to Calloways Farm, Lemon-scented Fern (*Oreopteris limbosperma*) was discovered in 1990, the first Island modern record. It persisted until 2007.

The majority of these species still survive, but the extent of bog vegetation has declined considerably since first surveyed in 1980, with considerable increases in Gorse and rushes (*Juncus spp.*), loss of some species and a considerable decline of others. The vegetation suggests that the area is gradually drying out and the spread of gorse is eliminating much of the interesting bog vegetation. Up to the point when conservation work was first carried out in the early 2000s, just one reasonably open area survived to the east which remained un-colonised by gorse and bramble where all the Pale Butterwort and most of the Sundew and other interesting species were confined.

A bryological survey by Pilkington (2012) found that an interesting feature of the hydrology was apparent from the distribution of species across this flush. The upper part of the flush was dominated by *Sphagnum* mosses, most commonly *S. palustre* and *S. subnitens,* which both indicate relatively acid and infertile water. About halfway down the flush, the groundwater chemistry appeared to change, and *Sphagnum* mosses were almost entirely replaced by carpets of *Calliergonella cuspidata,* indicating a movement towards eutrophic conditions and a circum-neutral pH. A significant number of mire specialist bryophytes recorded previously were not relocated in this survey and it is likely that the habitat has changed through decades, possibly by drying out, scrubbing over and/or nutrient enrichment.

When Bohemia Bog was first visited by botanists at the beginning of the twentieth century, Pale Butterwort was the principal plant that attracted their attention. It was the sole Island station for this plant. All the other wonderful bog plants, which can still be found here, were at the time widespread in the wider area. Sadly, that no longer remains the case. Reclamation for agriculture, gravel extraction, tipping and benign neglect has led to the loss of most of the sites and the few which remain - parts of Bleak Down, The Wilderness, Munsley Bog and Cridmore Bog, although still of botanical interest, have declined greatly in condition.

This pattern of loss has been repeated time and time again across lowland Britain. A recent assessment of the state of England's flora (Stroh, 2014) found that across England, habitats with the highest proportion of threatened species were also the least fertile: heaths and bogs. These habitats have suffered rapid, widespread and irreversible habitat loss and the fragmentation of populations. Apart from the loss of

**Fig. 3:** Western end of Bohemia Bog.
Left: Historic view of west end of site showing an abundance of Common Cotton Grass , not seen in recent years 15.05.66. Photo Reg Kettell.
Right view of the site, looking in the same direction in 1983.

sites, drainage and eutrophication of remaining sites were having substantive negative impacts. Changes in hydrology result in drier conditions which in turn allows the rapid invasion of shrub species that could not persist in saturated soils. Today, Bohemia Bog supports (or supported) populations of eight species of flowering plants and seven species of bryophytes found nowhere else on the Island. It also holds populations of many more species that are rare and in decline in the county. That is remarkable for a site of just over half a hectare. (Table 1)

When E.W. Pollard first found Pale Butterwort at Bohemia Bog, we also know from his annotated maps held by IWNHAS that he also recorded Round-leaved Sundew, Bog Asphodel and Common Cotton-grass (and Small-flowered Catchfly, *Silene gallica*, from the rough ground above Bohemia Bog). These four bog species became the signature species for which subsequent botanists visited the site and for a long time, little else was recorded. Nevertheless, three interesting, and somewhat enigmatic species were subsequently recorded.

When Rev. Douglas Montague Heath visited 'Rookley' on 30th June 1917, he collected a number of herbarium species. Generally, these give no indication to locality but some of his herbarium sheets are labelled 'wet meadows by The Wilderness'. However, because the collection includes Pale Butterwort, he must also have visited Bohemia Bog. He returned again on 20th June 1918 and collected a second specimen. There are also two herbarium sheets of Deergrass (*Trichophorum cespitosum s.l.*), not previously recorded from the Island. Although labelled 'Rookley', the two dates correspond with the dates he collected Pale Butterwort so it seems reasonable to conclude that these came from Bohemia Bog.

In 1966, 'the first Island record' for Deergrass was published (White, 1966). It was found by Mrs. D. Millington, who ran Access to the Countryside meetings and was not a botanist but the discovery was apparently determined by a Mrs Hewitt. Mrs Hewitt is not known as a botanist, but she joined the Society in the same year as Mrs. Millington and may have been a friend. Following Mrs Millington's discovery, Bohemia Bog was visited the following year, on 29th May, by Bill Shepard and Reg Kettell where they found the plant to be 'very rare.' Jim Bevis, an experienced botanist, visited on 30th June 1972 and recorded both Deergrass and the superficially similar Many-stalked Spike-rush, *Eleocharis multicaulis.* Deergrass was found to have increased tremendously. This proved to be the first record for the Spike-rush at Bohemia Bog, where it is a frequent and well-established component of the flora. In May 1977 (Fig.9) Deergrass was photographed *in situ* by Thelma White, botanical recorder at the time but there have been no confirmed subsequent records.

During a site visit in 1945, Gladys Bullock found Oblong-leaved Sundew (*Drosera intermedia*) growing

**Fig. 4:** Site visit by British Bryological Society in pouring rain on 15.03.02 showing Sphagnum hummocks and bog pools with Bog Pondweed. Photo Jonathan Sleath.

**Fig. 5:** Red Bog-moss, *Sphagnum capillifolium*, 17th November 2008.

**Fig. 6:** Feathery Bog-moss, *Sphagnum cuspidatum*, the most aquatic of the British species, 15th March 2002. Photo Jonathan Sleath.

| Species (Br = Bryophyte) | Number of extant sites considered extinct at Bohemia Bog | England Red List Status (flowering plants) |
|---|---|---|
| *Carex rostrata* (Bottle Sedge) | 5 | LC |
| *Cirsium dissectum* (Meadow Thistle) | 1* | LC |
| *Drosera intermedia* (Oblong-leaved Sundew) | 0* | VU |
| ***Drosera rotundifolia* (Round-leaved Sundew)** | 1 | NT |
| *Eleocharis multicaulis* (Many-stalked Spike-rush) | 1 | LC |
| ***Eriophorum angustifolium* (Common Cotton-grass)** | 3 | VU |
| ***Narthecium ossifragum* (Bog Asphodel)** | 1 | LC |
| *Oreopteris limbosperma* (Lemon-scented Fern) | 0* | LC |
| ***Pinguicula lusitanica* (Pale Butterwort)** | 1 | LC |
| *Potamogeton polygonifolius* (Bog Pondweed) | 4 | LC |
| *Trichophorum cespitosum s.l.* | 0* | LC |
| ***Wahlenbergia hederacea* (Ivy-leaved Bellflower)** | 1 | NT |
| *Sphagnum capillifolium* (Br) | 1 | |
| *Sphagnum cuspidatum* (Br) | 2 | |
| *Sphagnum fallax* (Br) | 3 | |
| *Sphagnum papillosum* (Br) | 1* | |
| *Cephalozia macrostachya* (Br) | 1 | |
| *Cladopodiella fluitans* (Br) | 1* | |
| *Kurzia paucifolia* (Br) | 1 | |
| *Odontoschisma sphagni* (Br) | 1 | |
| *Riccardia latifrons* (Br) | 1 | |

**Table 1:** The rarest plants of Bohemia Bog, occurring in five or fewer Island sites.
Red List Status: LC Least concern; NT Near threatened; VU Vulnerable Species in **bold** are illustrated in **Fig. 8.**

with Round-leaved Sundew and the record was duly published (Anon, 1945). There was no supplementary evidence, Oblong-leaved Sundew was not found by subsequent visits and Bevis *et al* (1978) were very dismissive of the record. However, Gladys Bullock was a good and meticulous botanist not known for making erroneous observations, and subsequent discoveries from the pollen record preserved in the peat have shown that *D. intermedia* was present from Bohemia Bog in the fossil pollen record. It could well be that Miss Bullock was fortunate to observe the last plants on the Island.

A third remarkable discovery was made in 2020. During a visit on 20th July to assess the recovery of areas of the bog where gorse had been removed and scrapes created three winters previous at the western end of the site, I was attracted to a flowering carpet of Bog Pimpernel and noticed that one or two flowers at the edge of the patch appeared bluish. Looking more closely, I could see that the flower structure was different and it suddenly occurred to me that this was something special. I realised was looking at a small patch of Ivy-leaved Bellflower (*Wahlenbergia hederifolia*). Looking up, I saw that there was a larger, very prolifically-flowering patch very close within the same little clearing.

I couldn't believe what I was seeing, and it seemed to me inconceivable that this would have been missed before. Perhaps botanists spent less time in the western


**Fig. 7:** Deergrass (*Trichophorum caespitosum*) Herbarium sheet collected by D.M. Heath, left hand specimen from Bohemia Bog, 1918 (Herbarium at University of Birmingham Library).

**Fig. 8:** Some of the star plants of Bohemia Bog.

Top left: Round-leaved Sundew (*Drosera rotundifolia*) 20.08.19.
Top right: Pale Butterwort (*Pinguicula lustitancia*) 11.08.17.
Middle left: Bog Asphodel (*Narthecium ossifragum*) 11.08.17.
Middle right: Ivy-leaved Bellflower (*Wahlenbergia hederifolia*) 27.07.20.
Bottom left: Common Cotton-grass (*Eriophorum angustifolium*) 28.06.19.
Bottom right: Bog Pimpernel (*Anagallis tenelia*) 10.07.07.

**Fig. 9:** Deergrass (*Trichophorum caespitosum*). Photograph in situ by Thelma White. May 1977.

end of the site, away from the core area, but a 1966 photograph by Reg Kettell shows an abundance of cotton grass at the western end of the site. A photograph of the western end taken in 1983 shows the area was still good, but becoming scrubbed over (Fig. 3).

However, a possible explanation is that visits were usually earlier in the year, before *Wahlenbergia* is in flower. Also, populations are known to fluctuate considerably from year to year, flourishing for a few years after clearance and then disappearing as shade increases. It is likely that a seedbank was disturbed by recent work and it is probable that the plant has not been present on the site for very many years. This is interesting because little is known about seed bank persistence (Smith, 2019).

Bromfield (1856) reports Ivy-leaved Bellflower as being not infrequent 'on Bleak Down, in various places, especially on a boggy tract along the northern declivity above the road leading to Godshill, in some abundance.' This description could well encompass the Bohemia site. The last Island record was made by Rev D. M. Heath on 4th July 1918; there are two herbarium sheets in Birmingham University herbarium labelled 'Godshill, near Ventnor'. As noted above, we know that he visited Bohemia Bog (which is described as 'Rookley') on two occasions in June 1917 and 1918 when he collected Pale Butterwort and Deergrass but not the bellflower as it may have been too early to find it in flower.

In Britain, Ivy-leaved Bellflower is an Atlantic species with its core area in Wales and southwest England but there are small population clusters in the New Forest, the Weald and south Pennines. It has declined over a long period and has been lost from a number of localities in southern and central England. Losses are mainly a result of habitat destruction, in particular the agricultural improvement of damp pasture through fertilisation and land drainage, along with under management or abandonment of rough grazing land (Smith, 2019). They are usually associated with seepages and spring lines in shallow valleys and habitat patches can be very small, for example a few square metres around a discrete spring.

**Efforts to protect Bohemia Bog**

After the Second World War, a Nature Reserves Investigation Committee, composed of leading ecologists of the time, was set up to explore the concept and requirements of a series of national nature reserves. Local sub-committees were tasked with drawing up lists of possible sites. In 1944, The Hampshire and Isle of Wight Sub-committee had proposed twenty-seven areas in the Island as eligible for preservation, 'in as far as may be found possible' (Stroh, 1944). These included 'Bohemia Bog, near Chequers' for its plants, but not Bleak Down. The Nature Reserves Investigation Committee recommended that reserves should be made the responsibility of the science, rather than the planning, sector of Government, as part of a wider institutional development of post-war ecological research in the U.K.

In 1949, the Government at the time passed the National Parks & Access to the Countryside Act which gave provision for the establishment of the Nature Conservancy. One of their jobs was to identify and protect a national network of sites containing the most important habitats which provided an opportunity for scientific research. These were termed Sites of Special Scientific Interest, or SSSIs. In 1965, Colin Tubbs, who was at the time the Assistant Regional Officer for the Nature Conservancy with responsibility for the Isle of Wight, wrote to the Isle of Wight Natural History & Archaeological Society requesting their views on a proposed revision of SSSIs on the Isle of Wight and asking them to assess a short list of unscheduled sites.

At the time, the Society had an active conservation committee with a voluntary Conservation Officer, Mr D W Axten. Amongst sites, the Society proposed that Bleak Down and Bohemia Bog should both be scheduled as an SSSI. It was customary for NCC to request the view of the landowner and the farmer of Bohemia Bog, Mr Hilton Attrill, refused assent to notification. Consideration of scheduling the site was put to NCC Conservation Sub-Committee which met on the 5th November 1965. Colin Tubbs subsequently wrote to the Society informing them that, 'The suggestion (minute 53) that part of Bleak Down should be 'released' for a SSSI suggests that these points have not been fully appreciated. If, in view of the foregoing, the Society wish to persist with their recommendation that Bleak Down and Bohemia should be designated, perhaps you would let us know.'

Subsequently, Mr Axten, wrote to Colin Tubbs on 27th September 1967, 'At a recent meeting of our conservation committee it was agreed therefore to ask you to schedule Bohemia Bog as an SSSI in spite of the non-cooperation of the owner… As Bleak Down is almost beyond salvation it is, as you will realise, more important than ever that Bohemia be scheduled an SSSI.' Colin Tubbs' reply pointed out that, 'As you remark, the Conservancy has powers to schedule a site as SSSI without the owner's consent but, save in exceptional circumstances, it is not the policy of the Conservancy to do so since the protection of the site depends so largely on the active co-operation of the owner.' The proposal to designate the site was subsequently dropped.

In 1969, Bill Shepard wrote the following account of his view on Bohemia Bog:

*'Bohemia Bog occupies the ground falling steeply towards the road to Calloway's Farm, and only the roadside bank separates one from the other, with much of the drainage seeping through this natural barrier and*

*forming an ever-running rivulet down the road into the farmyard. It is a never ceasing source of wonderment how this water-laden earth bank retains the semi-liquid mass behind it, and perhaps more pertinent, for how much longer. The end is certain, but whichever comes first, collapse of the roadside bank with the ever-increasing volume and individual size of traffic, or a drainage conscious farmer, the consequence will be the same. The loss of one of the most important botanical sites we at present possess.'*

Much later, in 2001, the Isle of Wight Council designated Bohemia Bog as a Site of Importance for Nature Conservation (SINC), a lower grade local designation, in view of its habitat and species assemblage.

**Site Management**

For the past hundred years, the Attrill family have owned and managed Bohemia Bog as part of their larger land holding. Management has consisted of grazing by heifers and steers. They maintained short vegetation and a level of poaching of peat within the richer parts of the flush allowing microhabitats for the smaller specialist species to persist. Periodically scrub was burnt off. The adjoining acid grassland has been fertilised and improved for forage; however, the bog was not drained as it was considered to be too small to be worth the effort (R. Attrill, pers. comm.). In more recent years, fewer stock have been put on the land and the extent of scrub has increased significantly, threatening the survival of the bog. In 2020, the owner put the property (Calloway's Farm) on the market.

Since 2002, the charity Gift to Nature, under Ian Boyd's guidance, has worked with the Wildlife Trust and Environment Agency to improve habitat management with the help and support of the farmer, Malcolm Attrill. They have cleared back overgrowth, set up fencing for grazing control, and begun to extend the bog by uncovering its margins. They have restored about 0.5ha of new bog by painstakingly clearing scrub from around and between the remaining patches of high-quality bog.

In November 2018, a digger was brought in to create new clearances, scrapes and hollows, principally at the western end of the site which has suffered the greatest from scrub invasion. (Fig. 10)

They are also managing the site for its invertebrates and, in particular, for its Hemiptera. A key species found by Adam Wright on the site in August 2014 was *Paradelphacodes paludosa*. This plant-hopper is a bog-loving moss dweller and Notable A wetland species which lives on the sedges *Carex panicea* and *C. rostrata;* it was new to the Isle of Wight when discovered here. Other species recorded from the site include Adder (*Viper berus*), Common Lizard (*Zootoca vivipara*), Common Toad (*Bufo bufo*), and the Sphagnum associate waxcap fungus, *Hygrocybe coccineocrenata.*

The long-term future for Bohemia Bog is not promising. A change of ownership with different priorities presents practical issues with management. A pastoralist is unlikely to be attracted to a fragmented site that has insufficient forage for his livestock. For the Wildlife Trust, or other conservation body, the unit costs of micro-managing a small nature reserve is far greater than overseeing a large working landscape.

**Acknowledgements**

I am grateful to comments from Rob Scaife and to Robin Attrill for his thoughts and recollections of the site which was owned by his distant relatives.

All photographs by author, except where indicated

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**Fig. 10:** Mini-digger, driven by Kevin Smith, carrying out excavation work at Bohemia Bog November 2018. Natural Enterprise Ltd.

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# A REVIEW OF THE TURONIAN FAUNA FROM ROGER'S PIT, CARISBROOKE, ISLE OF WIGHT

***Dr Martin Munt***

## Introduction

In the early part of the twentieth century, several major studies were published on the Chalk of England. Jukes-Brown and Hill (1903-04) dedicated two of their three-volume memoir on the Cretaceous rocks of Britain to the Chalk, whilst Arthur Rowe published a five-part study on the zones of the White Chalk (excluding what we would now call the Grey Chalk subgroup or the Lower Chalk) of the coast of England between 1900 and 1908. Amongst more localised studies, that of R.M. Brydone (1912) on the Chalk of Hampshire stands out as a thorough study of the many quarries and road cuttings that dotted the landscape. Between the 1920s and 1940s, Christopher Gaster published a string of papers on the Chalk of Sussex.

Arthur Rowe's work was essentially about documenting the fauna found at the different localities according to the zonal system at the time, largely derived from the pioneering work of Charles Barrois (1876). The works of Rowe, Brydone and Gaster included maps showing the distribution of the Chalk zones, and a particularly useful aspect of Rowe's maps was that they were drawn onto Ordnance Survey maps and show the locations of the quarries in the study.

The Isle of Wight was the subject of the final part of Rowe's work and undoubtedly benefitted from both his own and his companions' experience in the other areas of study (Sussex, Dorset, Devon, and Yorkshire). Rowe and his associates spent nine weeks recording the White Chalk of the Isle of Wight, surveying 108 quarries, along with the coastal exposures.

## The site

Rowe's Pit 51, known as Roger's Pit, Carisbrooke (SZ 490 877) marked on Fig. 1, stands out as one of the richest fossil localities in the Chalk of the Isle of Wight. At the time, the zones exposed in the pit were referred to the Middle Chalk, defined essentially as pure chalk without flints, and the Upper Chalk, being pure chalk with flints. The diversity of fossils found there is well-represented in the Isle of Wight Council geological collection, cared for by the staff of Dinosaur Isle Museum, Sandown.

The collection of fossils from Roger's Pit is not huge; however, it's the diversity that stands out, with well-preserved bony fish remains and, notably, ammonites and nautiloids. This level of diversity is not seen elsewhere in the Island's Chalk, apart from the green nodule beds in the *Marsupites testudinarius* to *Offaster pilula* biozone, now the part of the Newhaven Chalk Formation between Culver Cliff and Whitecliff Bay.

Roger's Pit clearly attracted the attention of some of the Island's most well-known, early twentieth century fossil collectors. The catalogue at Dinosaur Isle Museum records the names of the donors: this includes former curator of the Museum of Isle of Wight Geology, J.F. Jackson and his patron Frank Morey. Collections were also made by Hubert Poole and G.T. Woods. Most of the specimens entered the collection between 1924 and 1926. These were collectively the people who brought the museum to life and kept it alive through to the Second World War.

Today the quarry is the headquarters of the builders Mount Joy. There is a marked difference between Rowe's finds and those made in the 1920's. This stands out particularly in the echinoid record, reflecting the poor exposure of the *plana* Biozone in the 1920s, in contrast to the timing of Rowe's visit in the 1900s.

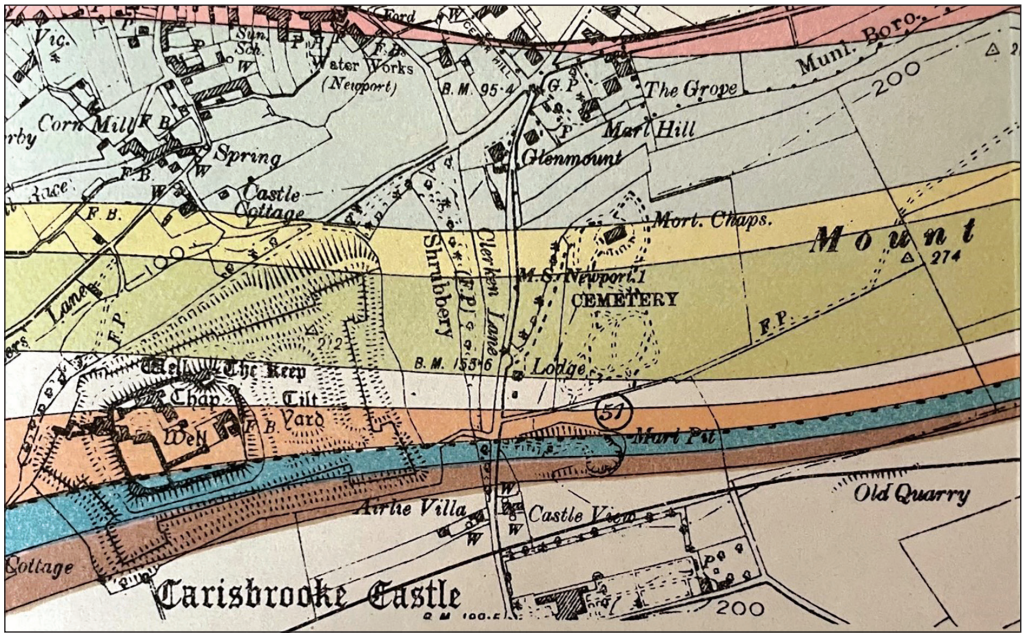


**Fig. 1: Map extracted from Rowe (1908) showing the location of Roger's Pit number 51.**

'Middle Chalk'.

Brown = *Rhynchonella cuvieri.*

Blue = *Terebratula gracilis.*

Orange = *Holaster planus sensu* Rowe, for an update see Figure 3.

## STRATIGRAPHY

As the collecting took place in the early part of the twentieth century, finds were recorded by zone. Rowe's map, plate D (Fig. 1) shows the quarry cut along strike with the *Rhynchonella cuvieri* and *Terebratula gracilis* Biozone forming most of the quarry and the *Holaster planus* Biozone forming the north wall of the quarry. Rowe (p.280) noted that the Plenus Marls were not seen in the quarry, which indicates that the quarry contained only the Middle and Upper Chalk as he would have interpreted it.

In subsequent revisions of the zonal system, for example Rawson *et al*. 1978, the *cuvieri* Biozone forms part of the *Inoceramus labiatus* Biozone (now *Mytiloides labiatus* Biozone), *gracilis* Biozone corresponds to the *Terebratula lata* Biozone (now the *Gyrosoria lata* Biozone, and the *Terebratulina lata* Biozone) and *planus* Biozone is unchanged, but is now known as the *Pleisocorys* (*Sternotaxis*) *plana* Biozone.

In terms of translating the stratigraphy of Roger's Pit into current lithostratigraphy (see Fig. 3), the *Mytiloides labiatus* Biozone can be correlated to the Holywell Nodular Chalk Formation, whereas the lower part of the *lata* Biozone is contained within the New Pit Chalk Formation. The remainder of the zone plus the *plana* Biozone zone are part of the Lewes Nodular Chalk Formation (all *sensu* Bristow *et al.*,1997, see Mortimore, 2011) .

The collectors of the specimens used *labiatus* and *lata* Biozone for the Middle Chalk. Curiously there are few records for the *S. plana* zone in the geological museum collection. Perhaps it was inaccessible during their collecting visits, whereas Rowe collected and recorded over 21 taxa for that zone from the pit. Rowe recorded 79 taxa in total from the *plana* Biozone of the Isle of Wight.

There are a few other stratigraphic clues in Rowe's account. Modern Chalk lithostratigraphy leans heavily on marker horizons such as flints and marl seams, and the significance of such features was not missed by Rowe. On page 281, Rowe noted that within the *gracilis* Biozone, (*lata* Biozone = New Pit Chalk Formation) was a layer of siliceous nodules known as the Spurious Chalk Rock. Mortimore (2011a, p.303) describes this layer as a glauconitised, phosphatised hardground with pyrite nodules.

A grey, and also a black marl band were visible. The black marl seam, seen in the northern wall of pit 51 could also be seen (and can still be seen) in Rowe's pit 77 at Brighstone (see Mortimore, 2011a page 304). Known as the Southerham Marl, it is an important marker in the Lewes Nodular Chalk Formation and occurs approximately three metres above the Spurious Chalk Rock in pit 77. The grey marl seam was described by Brydone (1917) as '8-10 foot above the black marl and separated by nodular chalks on the Island'. This compares favourably with the three metres separating the two marl seams at Cheverton Quarry where the grey marl is identified as the Caburn Marl (see Mortimore, 2011a, p.303, Fig. 4).

The Chalk Rock with its diverse mollusc fauna has not been seen at Roger's Pit. Woods (1896) recorded a thickness of eight inches (20 cm) to two foot seven inches (79cm) on the Isle of Wight. So, it is poorly developed compared to Wiltshire where it is up to twelve feet (3.6 m) thick. The Chalk Rock fauna is best known from Berkshire, Oxfordshire and Bedfordshire.

**Fig. 2:** Rare nautiloid MIWG 4407 *Eutrephoceras sublaevigatum* (d'Orbginy, 1850), *lata* Biozone.

## PALAEONTOLOGY

These abbreviations are used in the following account.
IWCMS = Isle of Wight Council Museum Service.
MIWG = Museum of Isle of Wight Geology.
(R) = Revision of identification.
(S) = Updated synonymy.

### Sponges

Whereas sponges are both common and diverse in the British Chalk, much of the literature is historic. Toulmin Smith (1848), Hinde (1883) and Reid (1959-1997) are the main sources. Reid (1962) reviewed the sponges of the Chalk Rock. Wood (2002) provides a summary of some of the common forms found in the Chalk. More recent revisions of late Cretaceous sponges have focused on well preserved sponges from eastern Germany and Poland e.g. Świerczewska-Gladysz (2012). Rowe (1908) records eighteen different sponge taxa from Isle of Wight in the three zones exposed at Roger's Pit, but none are specifically mentioned from there.

*Sponges: material*

MIWG 375 *Plocoscyphia* sp., *labiatus* Biozone, J.F. Jackson.

MIWG 376 *Plocoscyphia* sp., *labiatus* Biozone, J.F. Jackson.

MIWG 1487 *Cephalites bennettiae* (Mantell, 1822), *labiatus* Biozone, J.F. Jackson.

MIWG 1488 *Camerospongia campanulata* (T. Smith, 1848), *labiatus* Biozone, J.F. Jackson.

<table>
<tr><th></th><th>Rowe 1908 zones</th><th>Rawson et al. 1978 zones</th><th>Current zonal names</th><th>Lithostratigraphy</th><th>Ammonite zones</th></tr>
<tr><td rowspan="2">Upper Chalk</td><td>Holaster planus</td><td>Holaster planus</td><td>Pleisocorys (Sternotaxis) plana</td><td>Lewes Nodular Chalk Formation</td><td>Subprionocyclus neptuni</td></tr>
<tr><td rowspan="3">Middle Chalk</td><td>Terebratula gracilis</td><td>Terebratulina lata</td><td>Gyrosoria lata</td><td rowspan="2">New Pit Chalk Formation</td><td rowspan="2">Collignoiceras woollgari</td></tr>
<tr><td>Rhynchonella cuvieri</td><td>Inoceramus labiatus</td><td>Mytiloides labiatus</td><td rowspan="2">Holywell Nodular Chalk Formation</td></tr>
<tr><td>Mammites nodosoides</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Fagesia catinus</td></tr>
</table>

**Fig. 3:** The Turonian stratigraphy of southern England.

MIWG 2826 *Plocoscyphia* sp., Spurious Chalk Rock, J.F. Jackson.

MIWG 4019 *Ventriculites impressus* (T. Smith, 1848), *lata* Biozone, G. T. Woods.

**Serpulids**

The tubes of serpulid worms are common throughout the Chalk, usually attached to the shells of molluscs or echinoid tests. A single specimen in the IWCMS collection comprises an isolated round, unattached tube, slightly bowed, of irregular thickness, with irregular moderate growth line, possibly *Glomerula gordialis* (Schlotheim, 1820), but lacking the distinctive knotted early section of the tube.

*Serpulids: material.*

MIWG 4411 *Serpula* sp., H. F. Poole.

**Brachiopods**

Brachiopods are a major component of the British Chalk fauna and have been studied extensively. For a general overview, reference should be made to Owen (2002). Terebratulids (see Sahni,1929 and 1958) and rhynchonellids (see Pettitt, 1949 and 1954) dominate the fauna along with epifaunal craniids. The conspicuous Chalk genus *Cretirhynchia* was revised by Simon and Owen (2001). The Biozone fossil *Gyrosoria lata* (Etheridge, 1881) was reviewed by Sklenář and Simon (2009). No micromorphic brachiopods have been recognised from Roger's Pit.

From the Island as a whole, Rowe (1908) recorded nine brachiopod taxa across the three Biozones seen at Roger's Pit. Of these taxa, five were recorded from the pit.

These are the zone fossils *Rhynchonella cuvieri* (d'Orbigny, 1847) (= *Orbirhynchia cuvieri*) and *Terebratulina gracilis* (= *Gyrosoria lata* (Etheridge, 1881)) *Terebratula carnea* (J. Sowerby, 1812) (= *Carneithyris carnea*), and *Gibbithyris semiglobosa* (J. Sowerby,1813)

were recorded from the *plana* Biozone. The latter was recorded across all three zones, IWCMS registers record these as coming from the *lata* Biozone.

*Brachipods: material*

MIWG 384 *Orbirhynchia cuvieri* (d'Orbigny, 1847), *labiatus* Biozone, J.F. Jackson.

MIWG 4016 *Gibbithyris semiglobsa* (J. Sowerby,1813), *lata* Biozone, G. T. Woods.

MIWG 4408 *Orbirhynchia cuvieri* (d'Orbigny, 1847), *labiatus* Biozone, H. F. Poole.

MIWG 4409 *Gibbithyris semiglobsa* (J. Sowerby,1813), *lata* Biozone, H. F. Poole.

MIWG 6327 '*Terebratula*' sp. Collector unknown.

**Bivalves**

The White Chalk subgroup, in contrast to the Grey Chalk subgroup, has a quite limited diversity of bivalves, principally comprising inoceramids, oysters and pectinids. However, within individual families there is considerable diversity. For example, the inoceramids, which are of great biostratigraphic significance, with their own zonal system, are of great utility for international correlation. The abundant and widespread *Mytiloides labiatus* (Schlotheim,1813) is used in the standard Biozone system in the Lower Turonian, and there are nine individual inoceramid zones recognised within the Turonian.

As with gastropods and ammonites, bivalves are far more diverse in the Chalk Rock as recorded by Woods (1897). Rowe (1908) records twenty-two bivalve taxa from the Island in the three zones represented at Roger's Pit.

Rowe recorded *Mytiloides mytiloides* (Mantell, 1822) as *Inoceramus mytiloides*, but possibly meaning *Mytiloides labiatus* (Schlotheim, 1813), *from the cuvieri* Biozone, and *Inoceramus brongniarti* Mantell, 1822 (= *Cremnoceramus brongniarti*) from the *plana* Biozone, Rowe considered *C. brongniarti* a characteristic fossil from that zone.

*Mytiloides labiatus* (Schlotheim, 1813) is used *sensu lato* for the purpose of this study, as it represents several different forms and species, see Cleevely and Morris (2002 p.112-13). *Spondylus spinosus* (J. Sowerby, 1814) first appearing in the Cenomanian, occurs almost throughout the White Chalk subgroup. Typically, the bivalves are preserved as neomorphosed calcite shells, or as composite moulds.

*Bivalves: material*

MIWG 1521 *Ostrea* sp. = *Pycnodonte* (*Phygraea*) *vesiculare* (Lamarck, 1806), F. Morey. (S)

MIWG 2017 *Mytiloides labiatus* (Schlotheim, 1813), *labiatus* Biozone, collector unknown.

MIWG 4007 *Mytiloides labiatus* (Schlotheim, 1813), *labiatus* Biozone, G. T. Woods.

MIWG 4008 *Inoceramus lamarcki* Parkinson var. *cuvieri* = *Inoceramus apicalis* Woods, 1911, *labiatus* Biozone, G. T. Woods. (S)

MIWG 4009 *Inoceramus* sp. G. T. Woods.

MIWG 4010 *Spondylus spinosus* (J. Sowerby, 1814), G. T. Woods.

MIWG 4405 *Spondylus* cf. *fimbriatus* Goldfuss, 1835, Collector unknown.

MIWG 4923 *Mytiloides labiatus* (Schlotheim, 1813), *labiatus* Biozone, F. M. Walker.

MIWG 7350, *Mytiloides labiatus* (Schlotheim, 1813), *labiatus* Biozone, H.F. Poole.

**Fig. 4.1:** MIWG 7350 *Mytiloides labiatus* (Schlotheim, 1813), *labiatus* Biozone.

**Gastropods**

Woods (1896) recorded a diverse gastropod fauna from the Late Turonian Chalk Rock (*Pleisocorys* (*Sternotaxis*) *plana* Biozone) in southern England. However, and probably due to the Chalk Rock not having been seen at Roger's Pit, only the pleurotomariid *Bathrotomaria perspectiva* (Mantell, 1822) has been recorded from Roger's Pit from the *lata* Biozone. British pleurotomariids were reviewed by Cox (1960, see pages 406-408) who records this wide-ranging taxon from the Albian Upper Greensand to the Coniacian *Micraster coranguinum* Biozone.

*Gastropods: material.*

MIWG 389 *Leptomaria perspectiva*, = *Bathrotomaria perspectiva* (Mantell, 1822), *lata* Biozone, F. Morey. (S)

**Ammonites**

Ammonites are a striking element of the fauna from pit 51 and are recorded from all three zones. Preservations are variable from good to poor and distorted; they are preserved as composite internal moulds. 'Middle Chalk' ammonites have been studied extensively, notably Wright (1979), Wright and Kennedy (1981) and more recently Kennedy (2019-20). The Chalk Rock, not seen in pit 51 is the last time ammonites are diverse and common in the English Chalk.

*Ammonites: material*

MIWG 390 *Pachydiscus peramplus* = *Lewesiceras peramplum* (Mantell,1822), *labiatus* Biozone, F. Morey. (S)

MIWG 391 *Pachydiscus peramplus* = *Lewesiceras peramplum* (Mantell,1822), *lata* Biozone, F. Morey. (S)

MIWG 392 *Pachydiscus peramplus* = *Lewesiceras peramplum* (Mantell,1822), *lata* Biozone, G.T. Woods. (S)

MIWG 393 *Collignoniceras woollgari* = *Romaniceras* (*Yubariceras*) *ornatissimum* (Stoliczka,1865), *lata*

**Fig. 4.2:** MIWG 389 *Bathrotomaria perspectiva* (Mantell, 1822), *lata biozone*.

Biozone, J. F. Jackson. (R) Fig 4.4 above right.

MIWG 1022 *Collignoniceras woollgari* G. T. Woods.

MIWG 1390 *Pachydiscus peramplum = Lewesiceras peramplum* (Mantell,1822), *labiatus* Biozone, J. F. Jackson. (S)

MIWG 4004 *Pachydiscus peramplum = Lewesiceras peramplum* (Mantell,1822), *lata* Biozone G. T. Woods. (S)

MIWG 4005 *Pseudojacobites* sp. = *Romaniceras* (*Yubariceras*) *ornatissimum* (Stoliczka,1865), *lata* Biozone, G. T. Woods. (R)

MIWG 4006 *Subprionocyclus neptuni* (Geinitz, 1849), *lata* Biozone, G. T. Woods. This specimen is more likely to be from the *plana* Biozone.

**Fig. 4.3:** MIWG 392 *Lewesiceras peramplum* (Mantell,1822), *lata Biozone*.

## Nautiloids

Rowe (1908, p. 293) recorded *Nautilus* cf. *atlas* from the *cuvieri* Biozone which he felt sufficiently rare to note. The IWCMS holds four specimens assigned to *Cymatoceras atlas* (Whiteaves, 1876) from the *lata* Biozone.

*Kennedy (2002) recorded that C. atlas is restricted to the Cenomanian, with records of nautiloids previously ascribed to Cymatoceras from the Turonian S. neptuni ammonite zone, assigned to the genus Deltocymatoceras. Deltocymatoceras has the distinct ornament of ridge typical of cymatoceriids, and its venter is acute.*

*Woods (1896) and Kennedy (2002) record the long ranging Eutrephoceras sublaevigatum (d'Orbigny, 1850) ranging to the Upper Turonian in southern England. The Roger's Pit specimens do not have the characteristic ornament of cymatoceriids; however, the umbilicus is fully occluded and this is a character of Eutrephoceras sublaevigatum to which this material is now assigned.*

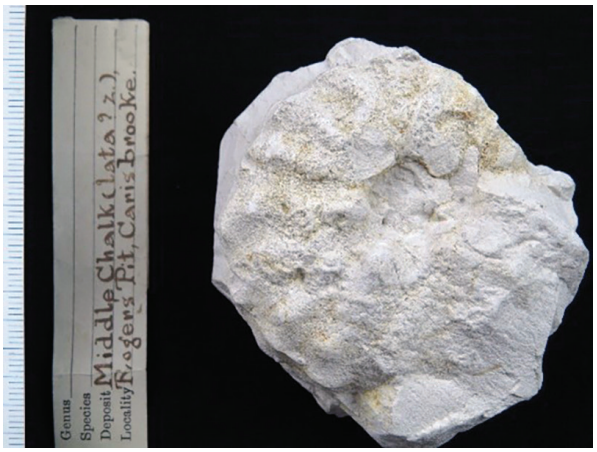


**Fig. 4.4:** MIWG 393 *Romaniceras (Yubariceras) ornatis-simum* (Stoliczka,1865), lata biozone.

*Nautiloids: material*

MIWG 2018 *Cymatoceras atlas = Eutrephoceras sublaevigatum* (d'Orbigny, 1850), *lata* Biozone, J. F. Jackson. (R)

**Fig. 4.5:** MIWG 4006 *Subprionocyclus neptuni* (Geinitz, 1849), *lata Biozone*.

MIWG 4003 *Cymatoceras atlas = Eutrephoceras sublaevigatum* (d'Orbigny, 1850), *lata* Biozone, G. T. Woods. (R)

MIWG 4407 *Cymatoceras atlas = Eutrephoceras sublaevigatum* (d'Orbginy, 1850), *lata* Biozone, G.T. Woods. (R)

MIWG 4407a *Cymatoceras atlas = Eutrephoceras sublaevigatum* (d'Orbginy, 1850), *lata* Biozone, G.T. Woods. (R)

## Arthropods

Chalk arthropods are summarised by Morris and Collins (2002). Devillez *et al.* (2017) provides a useful revision of the larger lobsters from the Late Cretaceous, concluding that *Enoploclytia* was the dominate genus at the time. Malacostraca are never abundant in the Chalk which makes the specimens from Roger's Pit rare finds. Rowe (1908) made no records of lobsters from the White Chalk subgroup of the Isle of Wight.

*Arthropods: material*

MIWG 381 *Enoploclytia* sp., *lata* Biozone, F. Morey.

MIWG 3257 *Enoploclytia leachii* (Mantell, 1822), *labiatus* Biozone, J. F. Jackson.

MIWG 4015 *Glyphea willetti* (Woodward, 1878), *lata* Biozone, H. F. Poole.

**Echinoids**

Smith and Wright (2002) provide an excellent overview of the echinoderms from the Chalk. Rowe (1908) records 33 different echinoids, asteroids and crinoids from the three zones represented at Roger's Pit, including *Echinocorys scutata* Leske, 1778, *Gauthieria radiata* (Sorignet,1850) *Pleisocorys* (*Sternotaxis*) *plana* (Mantell,1822), *Micraster leskei* d'Orbigny, 1855, and *Micraster corbovis* Forbes, 1850 from the *plana* Biozone.

The fauna collected by Rowe is in marked contrast to the IWCMS collection, and reflects over ten years difference in the exposures in the quarry. *Conulus subrotundus* Mantell, 1822 is common in the Lower to Middle Turonian in southern England (Smith and Wright, 2002).

*Echinoids: material*

MIWG 378 *Conulus subrotundus* Mantell, 1822, *lata* Biozone, J. F. Jackson.

MIWG 379 *Conulus subrotundus* Mantell, 1822, *lata* Biozone, J. F. Jackson.

MIWG 2016 *Galerites* sp. Biozone and collector unknown.

MIWG 4017 *Conulus subrotundus* Mantell, 1822, G. T. Woods.

MIWG 4018 *Discoidea dixoni* Forbes, 1850 = *Dixonia dixoni* (Forbes, 1850) *lata* Biozone G. T. Woods. (S)

MIWG 4410 *Conulus subrotundus* Mantell, 1822, *lata* Biozone, H. F. Poole.

**Sharks and rays**

These comprise isolated teeth.

*Material*

MIWG 395 *Otodus* sp. = *Cretoxyrhina mantelli* (Agassiz,1843) *lata* Biozone, F. Morey. (R)

MIWG 396 *Oxyrhina* sp. *lata* Biozone, J. F. Jackson.

MIWG 3696 *Ptychodus mammilaris* Agassiz, 1835. W. H. Daniel.

MIWG 4401 *Ptychodus mammilaris* Agassiz, 1835. *lata* Biozone, H. F. Poole.

MIWG 4402 *Odontaspis* sp. *lata* Biozone, H. F. Poole.

**Bony Fish**

These exceptionally preserved, articulated bony fish are the best-preserved fish remains from the Chalk of the Island, and are comparable to the those illustrated by Mantell (1822). A summary of Chalk fish remains is given by Longbottom and Patterson (2002); however, reference should be made to Woodward (1902-12).

*Bony Fish: material*

MIWG 398 *Hoplopteryx* sp. *lata* Biozone, J. F. Jackson.

MIWG 1522 *Hoplopteryx* sp. *lata* Biozone, J. F. Jackson.

MIWG 2019 *Hoplopteryx* sp. *lata* Biozone, J. F. Jackson.

MIWG 4013 fish scales *lata* Biozone, G. T. Woods.

**Fig. 4.6:** MIWG 395 *Cretoxyrhina mantelli* (Agassiz,1843) *lata* biozone.

MIWG 4400 *Osmeroides lewesiensis* (Mantell, 1822), *lata* Biozone, H.F. Poole.

MIWG 4012 *Berycopsis major* Woodward, 1902. *lata* Biozone, G. T. Woods.

**Miscellaneous**

The erect bryozoan *Bicavea rotaformis* Gregory, *1907 was recorded by Rowe from the plana Biozone. Rowe (1908, p.220) named the strata immediately above the grey marl (Caburn Marl) as the Bicavea Bed, due to its abundance.*

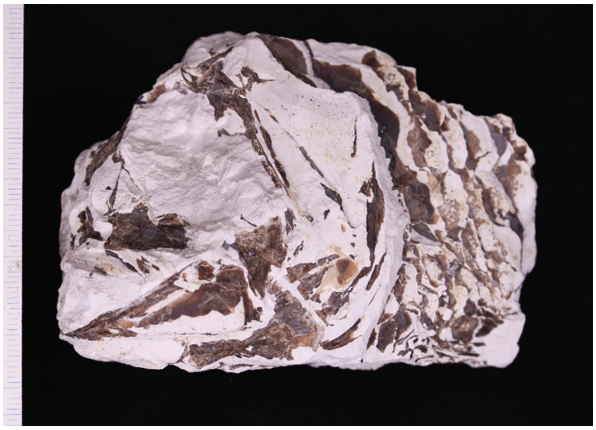

**Fig. 4.7:** MIWG 2019 *Hoplopteryx* sp. lata Biozone.

*Miscellaneous: Material*

MIWG 394 Coprolite, *lata* Biozone, J. F. Jackson.

MIWG 4014 fish = *Terebella lewesiensis* worm tube trace fossil with bones, *lata* Biozone, G. T. Woods. (R)

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# FLOWERING PLANTS AND FERNS, ISLE OF WIGHT, 2020

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Despite the effects of lockdowns due to the pandemic limiting our opportunities to botanise and preventing group meetings taking place, 2020 proved to be a good year for botanical recording with some remarkable and quality observations being made. This may, in part, be due to the pressure on recording for Atlas 2000 being lifted, enabling us to look for things which took our fancy at leisure.

It is heartening in 2020 to report the rediscovery of a number of native species which it was feared might have been lost from the Island's flora. Details can be found under the listings below.

In April, the Hampshire & Isle of Wight Wildlife Trust announced that they had purchased Little Duxmore Farm, a principally arable 40 ha farm off Rowlands Lane near Havenstreet, with the intention of 're-wilding' the land to enhance wildlife. Essentially, this will involve stopping the chemical input of fertilisers and pesticides and converting arable land to permanent grassland. However, a botanical survey commissioned by the Trust has established that the farm has a remarkably rich arable flora, with strong populations of many Red listed species. This will require a rethink of the management to allow parts of the site to continue to support an arable flora. Additionally, an area which had been used for keeping chickens has produced an interesting flora of plants probably brought in with chicken feed.

Another farming development has been the trend for farmers to sow cover crops, non-cash crops grown primarily for the purpose of protecting or improving the soil between periods of regular crop production. Cover crop mixtures are generally sown with the predominant crop being Brassicas (mustards, radishes or turnips), legumes (vetches or clovers) or grasses and cereals. However, some of these novel seed mixes have been found to contain some interesting and surprising seed contaminants.

**Fig. 1:** Arable cover crops. Left: Forage radish with *Helianthus, Phacelia* and *Linum*. Right: Egyptian clover.

Ryde Harbour was constructed in 1989, and been of little botanical interest until recently when the inner breakwater has started to become colonised by saltmarsh plants which otherwise would not have been expected along this stretch of coastline.

**Fig. 2:** Saltmarsh plants colonising the rock armouring at Ryde Harbour, Left: Sea Pink, *Armeria maritima*.
Right: Rock Samphire, *Crithmum maritimum*.

This year, the records have been divided into those of native species and archeophytes (plants associated with man's activities that have occurred in this country since at least Medieval times) and those of non-native species. Nomenclature follows Stace (2019). I am grateful to everyone who submits their records; all of them are valuable and all records have been digitised, whether reported here or not, and submitted to the BSBI.

**Natives and Archeophytes**

**Adder's-tongue fern** *Ophioglossum vulgatum*

Large numbers on the front lawn of a house in Galley Lane, Brighstone (SZ422829). A surprising find for a species that is strongly associated with old, unimproved grassland (PS).

**Sea Spleenwort** *Asplenium marinum*

Still persisting on a large boulder near St Catherine's Point (SZ492754) where it has been known since at least 1973 (AJB). The site has become increasingly difficult to access as it has become surrounded by almost inaccessible scrub. Twelve plants were counted on the southwest aspect and two on southeast aspect, a decline since last visited, but the population here does fluctuate.

**Hybrid Shield-fern** *Polystichum* x *bicknellii*

A single plant in Brighstone Forest (SZ420849) with both parents, Hard and Soft Shield-ferns (PS). The origin of the Hard Shield Fern is unknown; it is growing close to a roadside (Lynch Lane). Second Island record.

**Prickly Poppy** *Roemeria* (*Papaver*) *argemone*

A strong population of up to 300 plants on fallow arable land at Atherfield Farm, SZ473795 (PS). Listed as Vulnerable in the Red List for England.

**Tall Ramping-fumitory** *Fumaria bastardii*

Three plants appeared on ground disturbed by construction works for the new St Mary's junction highway works, SZ494902 (PS).

**Few-flowered Fumitory** *Fumaria vaillantii*

Two plants growing on a bank alongside barn at Tapnell Farm, SZ374867 (PS). Listed as Endangered in the Red List for England.

**Suffocated Clover** *Trifolium suffocatum*

Found on arable land east of Grammars Common, Brighstone, SZ416837 (PS).

**Dyer's Greenweed** *Genista tinctoria*

A large patch of flowering plants on the cliffs at Redcliff, Sandown SZ618853 (CRP). Usually associated with unimproved clay pastures on the north side of the Island, this is one of only two extant sites south of the central chalk ridge. Listed as Vulnerable in the Red List for England.

**Burnet Rose** *Rosa spinosissima*

A large patch on the cliff at Totland, SZ323871 (CRP). Also known from the cliff at Colwell. Bromfield (1856) describes Burnet Rose as being 'common about Colwell'.

**Hybrid Rose** *Rosa canina* x *R. tomentosa*

One bush by the trackside at Golden Hill, Freshwater SZ339879 (PS). Second Island record.

**Hybrid Violet** *Viola* x *contempta*

A hybrid between Field Pansy and Wild Pansy discovered on arable land at Little Duxmore, Ashey SZ563879 (MS). First Island record. One of the parents, Wild Pansy (*Viola tricolor*), is a very rare plant on the Island

**Creeping Willow** *Salix repens*

A group of about six bushes surviving in reeds in the south marsh, Afton Marsh, Freshwater, SZ348860 (CRP). The plants were growing up to 1.5m in height. Creeping Willow was considered to have been lost from the Island, with the last record in 1998 of a single plant surviving precariously on a ledge at Headon Warren. It was known historically from Freshwater Marshes with the last previous record in 1970.

**Fig. 3:** Creeping Willow, *Salix repens,* growing amongst Reed and Marsh Fern in Freshwater Marshes.

**Broad-leaved Spurge** *Euphorbia platyphyllos*

A huge population of thousands of plants discovered during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS). Growing amongst a cover crop of Egyptian Clover in arable fields at Great Park, Swainston SZ455887 (ML/PS).

**Dwarf Spurge** *Euphorbia exigua*

A huge population of thousands of plants discovered during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS). Dwarf Spurge is listed as Vulnerable in the Red List for England.

**Water-purslane** *Lythrum portula*

A large population discovered on the draw-down zone of a field reservoir between Northpark Copse and the old railway track, Swainston SZ437886 (ML/PS). A locally rare plant.

**Fig. 4:** Water-purslane, *Lythrum portula*, growing on mud in the draw-down zone of a reservoir at Swainston.

**Sea-pink** *Armeria maritima*

A surprise find of several flowering clumps growing between concrete blocks at Ryde Harbour breakwater SZ595929 (PSc). Fig. 2

**Cornfield Knotgrass** *Polygonum rurivagum*

A large population discovered during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS).

**Upright Chickweed** *Moenchia erecta*

Several hundred plants in parched acid grassland on St George's Down, SZ520865, (CRP). Last recorded from this site by Bill Shepard in 1965. Upright Chickweed is listed as Vulnerable in the Red List for England.

**Knawel** *Scleranthus annuus*

**Fig. 5:** Field margin at Appleford supporting a huge population of Knawel, *Scleranthus annuus*.

The population on sandy arable land at Appleford, Chale Green, first discovered by Geoff Toone in 2002, held an impressive population of many thousands of plants in 2020, SZ500806 (CRP). Two small patches in arable land at Coombe Farm, Brighstone, SZ419840 (ML/PS). Knawel is listed as Endangered in the Red List for England. It is frequently quoted as one of the plants that has shown the greatest decline in lowland England and Wales over the past twenty years.

**Night-flowered Catchfly** *Silene noctiflora*

One plant amongst game cover at Dunsbury Farm, Brook SZ387848; about 35 plants on arable land at Little Duxmore farm SZ559879 (PS). Night-flowered Catchfly is listed as Vulnerable in the Red List for England.

**Small-flowered Catchfly** *Silene gallica*

A remarkable population of some 500 plants on fallow arable land at Atherfield Farm, SZ473795 (PS). Eight plants on sandy arable at Coombe Farm, Brighstone SZ419840 (ML/PS). Small-flowered Catchfly is listed as Endangered in the Red List for England. It has become increasingly rare on the Island, with very few records in the past ten years.

**Sea-purslane** *Atriplex portulacoides*

Colonising cracks between concrete blocks at Ryde Harbour breakwater SZ595929 (PSc).

**Fig-leaved Goosefoot** *Chenopodium ficifolium*

Found to be abundant during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS).

**Maple-leaved Goosefoot**
*Chenopodiastrum* (*Chenopodium*) *hybridum*

Three plants on waste ground associated with roadworks near St Mary's Hospital, Newport, SZ493904 (PS).

**Oak-leaved Goosefoot**
*Oxybasis glauca* (*Chenopodium glaucum*)

Frequent on the draw-down zone of a field reservoir between Northpark Copse and the old railway track, Swainston SZ437886 (ML/PS). Oak-leaved Goosefoot is listed as Vulnerable in the Red List for England.

**Fig. 6:** Oak-leaved Goosefoot, *Oxybasis glauca*, colonising mud in the draw-down zone of reservoir at Swainston.

**Fig. 7:** Upright Goosefoot, *Oxybasis urbica*, growing on enriched soil at Little Duxmore Farm. Photo: Mark Larter.

**Upright Goosefoot**
*Oxybasis urbica* (*Chenopodium urbicum*)

Eight good plants found growing on enriched soil derived from an area previously used for keeping chickens at Little Duxmore farm, Ashey SZ558882 (PS/

ML). Upright Goosefoot is listed as Critically Endangered in the Red List for England. It is a plant that has existed in Britain since farming began when both the seeds and leaves were eaten. It has become extraordinarily rare in Britain and most records are casual; it is likely that the Duxmore plants came in with chicken feed. Attempts are being made by Natural England and the Species Recovery Trust to maintain it in cultivation. Fig. 7

**Annual Sea-blite** *Suaeda maritima*

Colonising cracks between concrete blocks at Ryde Harbour breakwater SZ595929 (PSc). Fig. 1

**Dodder** *Cuscuta epithymum*

The population on the south slopes of Afton Down had a good year with noticeable spreads of reddish stems SZ366855 (AM). Dodder is listed as Vulnerable in the Red List for England.

**Hybrid Woundwort** *Stachys* x *ambigua*

Found during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS).

**Field Woundwort** *Stachys arvensis*

A remarkable population of thousands of plants found during a survey of the arable flora at Little Duxmore Farm, Ashey SZ559880 (MS). Also recorded from arable land at Coombe Farm, Brighstone, SZ419840 (ML/PS), and arable margins of field alongside Northpark Copse, Swainston, SZ438884 (CRP). Field Woundwort is listed as Near Threatened in the Red List for England.

**Field Cow-wheat** *Melampyrum arvense*

An excellent year for the population at St Lawrence Bank, with an estimated 17,700 flowering plants, the highest this century (TS), making this easily the largest surviving population in the country. Field Cow-wheat is listed as Endangered in the Red List for England.

**Nettle-leaved Bellflower** *Campanula trachelium*

Found to be impressively frequent in rides in Mudless Copse, Swainston, (SZ448869) making this the largest extant Island population (CRP/GG).

**Yarrow Broomrape** *Phelipanche* (*Orobanche*) *purpurea*

An isolated population in a restricted area on Afton Down (SZ357857) has been known for some time. In 2020, two sites were found 40m apart, one with four plants and one with seventeen plants (AM). Yarrow Broomrape is listed as Vulnerable in the Red List for England.

**Ivy-leaved Bellflower** *Wahlenbergia hederacea*

Appeared at Bohemia Bog following scrub clearance, SZ514833 (CRP/GG). A remarkable find of a plant which it was long thought had been lost from the Island's flora; last recorded in 1918. For further details, see the article on Bohemia Bog elsewhere in this volume. Ivy-leaved Bellflower is listed as Near Threatened in the Red List for England.

**Sheep's-bit** *Jasione montana*

A population of around 100 flowering plants on inaccessible cliff ledges west of Shanklin, SZ584805 (CRP). This may well be the only extant site on the Island. It appears to have been lost from Sandown Golf Course, Blackgang and Luccombe Chine. Last previous record was 2013 from Luccombe Chine. Sheep's-bit is listed as Vulnerable in the Red List for England.

**Fig. 8:** Sheep's-bit, *Jasione montana*, growing on inaccessible cliff ledges south of Shanklin.

**Cornflower** *Centaurea cyanus*

Many plants in fallow arable land at Atherfield Farm, SZ473795 (PS). Not previously recorded from this site but within the range of the native arable population. The private site proved to be very productive for arable plants with large populations of Small-flowered Catchfly, Prickly Poppy, Smooth Cat's-ear and Corn Marigold.

**Fig. 9:** Cornflower, *Centaurea cyanus*, growing at a rich arable flora site, Atherfield.

**Smooth Cat's-ear** *Hypochaeris glabra*

Many plants in fallow arable land at Atherfield Farm, SZ473795; also recorded from arable land southwest of Grammar's Common, Brighstone, SZ413837 (PS). Smooth Cat's-ear is listed as Vulnerable in the Red List for England.

**Hybrid Cat's-ear** *Hypochaeris* x *intermedia*

A few plants with both parents identified at each of the two sites for Smooth Cat's-ear given above.

**A Hawkweed** *Hieracium umbellatum*

Scattered plants around the north marsh, Freshwater Marshes, SZ344865 (CRP), last recorded from here in 1924; a few plants on Sandown Golf Course, SZ585848 (CRP), last recorded from here in 1915 .

**Broad-leaved Cudweed** *Filago pyramidata*

Thirty-three very dwarf plants in the chalkpit at West High Down, where Paul Stanley first discovered it in 2012, SZ324855 (PS). Broad-leaved Cudweed is listed as Endangered in the Red List for England.

**Stinking Chamomile** *Anthemis cotula*

A huge population, estimated as millions, discovered during a survey of the arable flora at Little Duxmore

Farm, Ashey SZ559880 (MS). Stinking Chamomile is listed as Vulnerable in the Red List for England.

**Spreading Hedge-parsley** *Torilis arvensis*

A single large healthy plant discovered at Little Duxmore Farm, Ashey SZ558879 (MS). Previously recorded from nearby Duxmore Farm by Geoff Toone. Spreading Hedge-parsley is listed as Endangered in the Red List for England.

**Rock Samphire** *Crithmum maritimum*

Colonising cracks between concrete blocks at Ryde Harbour breakwater SZ595929 (PSc). Fig. 2

**Flat Duckweed** *Lemna gibba*

Remains frequent in ditches at Carpenters, Brading Marshes, SZ616881, its sole extant Island station (CRP).

**White Helleborine** *Cephalanthera damasonium*

Five flowering plants in holm oak woodland on St Boniface Down, SZ568781 (SO-M). White Helleborine is listed as Vulnerable in the Red List for England.

**Broad-leaved Helleborine** *Epipactis helleborine*

One plant in Walkershill Copse, Havenstreet, SZ549889 (PS); two plants in overgrown wooded garden at Rookley, SZ506841 (RA). It is persisting in its urban Newport location at Lidl carpark and a plant has appeared in Marks & Spencer carpark, also in Newport, SZ501889 (PS).

**Twayblade** *Neottia ovata*

Twayblade was a common and widespread orchid on the Island, principally occurring in woodlands, but it seems to have declined in recent years and many traditional sites hold very few or no plants today, although a number of sites with strong populations survive.

**Autumn Lady's-tresses** *Spiranthes spiralis*

Stephen Oakes-Monger has been meticulously recording sites of this orchid, particularly on garden lawns, as a result of which, its distribution is now better known than at any time in the past. Autumn Lady's-tresses is listed as Nationally Threatened in the Red List for England. Fig. 11

**Greater Butterfly Orchid** *Platanthera chlorantha*

It was discovered this year in Kemphill Moor Copse, Havenstreet SZ571896 (SO-M), from where it was last recorded in 1980. Surveys of the site resulted in a count of 30 plants, including 24 flowering plants, making this probably the largest extant Island population.

**Early Spider-orchid** *Ophrys sphegodes*

A single plant was found in flower close to the Old Battery at the Needles headland, West High Down, SZ294848 (WH). Fig. 10 This is the fifth occasion since 1992 that a plant has flowered on the Freshwater to Needles chalk downland but this one is by far the westernmost location, the rest having appeared within the vicinity of the Tennyson Monument.

**Hybrid Woodrush** *Luzula* x *borreri*

One clump by a ride in Kemphill Moor Copse, SZ571898 (PS). Fourth modern record.

**Galingale** *Cyperus longus*

Still persisting at its sole native location near St Catherine's Point, SZ502754 (AJB). Management by the National Trust has enabled the plant to survive but it is not showing signs of increasing. Galingale is listed as Near Threatened in the Red List for England.

**Fig. 10:** Early Spider-orchid, *Ophrys sphegodes*, near The Battery, Needles headland. Photo: Will Hannam.

**Hybrid Sedge** *Carex otrubae* x *C. divulsa* subsp. *divulsa*

Two plants growing along Rowlands Lane, north of Rowlands Farm, SZ564886 (PS).

**Hybrid Sedge** *Carex* x *emmae*

Seven plants on a roadside verge at Moons Hill, Freshwater, SZ332861 (PS). Second modern Island record.

**Hybrid Sedge** *Carex* x *subgracilis*

A few plants on Morton Marsh, Brading SZ595854 (PS). This is the hybrid between *Carex acuta*, rediscovered by Geoff Toone on Morton Marsh in 2018, and *C. acutiformis.* First Island record.

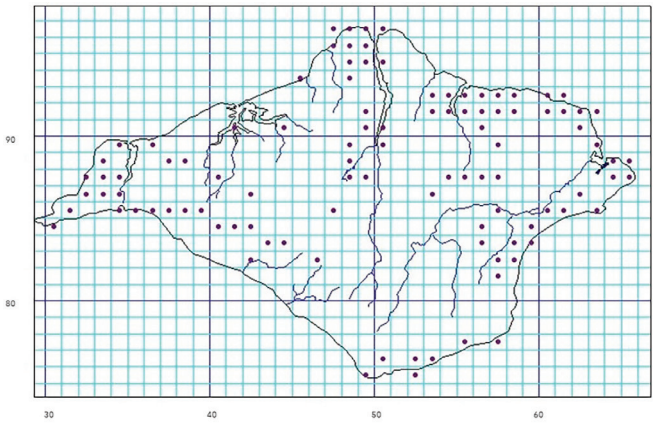


**Fig. 11:** 1 km2 distribution of Autumn Lady's-tresses, *Spiranthes spiralis*, post 2000.

**Hybrid Sedge** *Carex* x *pseudoaxillaris*

Recorded from a trackside in Firestone Copse, SZ557907; and roadside at Moons Hill, Freshwater, SZ332861 (PS).

**Mat-grass** *Nardus stricta*

In rough grassland southwest of the clubhouse on Sandown Golf course, SZ585847 (CRP). Last recorded from here by Margaret Burnhill in 1996. Otherwise only known from Brading Marshes. Mat-grass has become rare in lowland England and is listed as Near Threatened in the Red List for England.

**Sand Cat's-tail** *Phleum arenarium*

About two hundred plants in three discrete patches on Norton Spit, Yarmouth, SZ350897 (CRP). It has not been seen here, its sole Island locality, since 2006, despite several intensive searches. Sand Cat's-tail is listed as Near Threatened in the Red List for England

**Fig. 12:** Sand Cat's-tail, *Phleum arenarium*, Norton Spit.

**Aliens and Neophytes**

**Fortune's Holly-fern** *Cyrtomium fortunei*

A single young plant on the northern facing trackside of Play Lane leading to Dame Anthony's Common, Ryde, well away from housing, SZ580916 (CRP, det. Fred Rumsey). Fred Rumsey says, 'I would record this as *Cyrtomium fortunei* subsp. *clivicola*. The pinnae are relatively broad and with a smallish auricle and it lacks the shininess and fleshiness of *falcatum*. This would seem to be the plant most commonly sold in garden centres currently.' First Island record; all other records have referred to the closely related House Holly-fern (*C. falcatum*). Fig. 13

**Hybrid Plume-poppy** *Macleaya* x *kewensis*

Recorded from Melville Street, Ryde, SZ596925 (MS). First Island record.

**Mossy Stonecrop** *Crassula tillaea*

Large patch in sandy ground on south side of Ryde Canoe Lake, SZ602926 (CRP). Fig. 14

**Lesser Mexican-stonecrop**
*Sedum kimnachii* (*S. confusum*)

Monkton Street, Ryde, SZ597923 (MS). First Island record but some previous records for Greater Mexican Stonecrop, *S. praealtum,* may have been in error for this species.

**Purple Vetch** *Vicia benghalensis*

One of a number of rarely recorded peas and vetches

**Fig. 13:** Fortune's Holly-fern, *Cyrtomium fortunei*, Play Lane, Ryde, a lockdown discovery.

recorded as contaminants of a cover crop of Egyptian Clover, *Trifolium alexandrium*, sown in several fields at Great Park, Swainston, SZ45884 (PS). For many of these, it is the first modern Island record. Fig. 1

**Fodder Vetch** *Vicia villosa*

As above

**Hungarian Vetch** *Vicia pannonica*

As above

**Reversed Clover** *Trifolium resupinatum*

As above

**Hungarian Clover** *Trifolium pannonicum*

As above.

**Narrow-leaved Clover** *Trifolium angustifolium*

As above.

**Hedgehog Clover** *Trifolium echinatum*

As above.

**Mediterranean Nettle** *Urtica membranacea*

Cross Street, Ryde, SZ592926 (MS).

**Almond Willow** *Salix triandra*

Several bushes at Gunville, SZ481893, galled by the host specific gall midge, *Rabdophaga heterobia* (AM).

**French Mallow** *Malva nicaeensis*

One of a group of rarely recorded difficult mallows found growing on dung heaps previously used for keeping

**Fig. 14:** Mossy Stonecrop, *Crassula tillaea*, Canoe Lake, Ryde, another discovery during lockdown.

chickens at Little Duxmore Farm, Ashey, SZ559880 (PS). They probably arose from imported chicken feed.

**Least Mallow** *Malva parviflora*

As above. Also, a single plant on a dung heap at Gaggerhill Farm, Brighstone, SZ421835 (PS).

**Small Mallow** *Malva pusilla*

As above.

**Smaller Tree-mallow**
*Malva multiflora* (*M. pseudolavatera*)

As above

**Chinese Mallow** *Malva verticillata*

A well-established patch in an old flowerbed in Puckpool Park, Ryde, flowering for much of the year, SZ615921 (MS).

**Hoary Mustard** *Hirschfeldia incana*

A strong population of about 500 plants on waste ground at Binstead, SZ578923 (PS).

**Winter Heath** *Erica carnea*

Amongst native heaths on Sandown Golf Course, SZ585848 (CRP). Well away from houses but presumably originally planted, although now spreading.

**Purple Viper's-bugloss** *Echium plantagineum*

A single plant on waste ground associated with roadworks near St Mary's Hospital, Newport, SZ493904 (PS).

**Pink Hedge-bindweed**
*Calystegia sepium* subsp. *roseata*

Little Duxmore Farm, Ashey, SZ559883 (MS).

**Hairy Bindweed** *Calystegia pulchra*

Well established, growing through a roadside fence, The Square, Freshwater Bay, SZ342860 (CRP).

**Corsican Mint** *Mentha requienii*

Well established between paving stones at Fairlee Cemetery, Newport, SZ503896 (D&HT). Found during the 2020 New Year Plant Hunt.

**Yellow Star-thistle** *Centaurea solstitialis*

Two plants in an arable field sown with a radish cover crop, Military Road, Brook, SZ384838 (RL). Found whilst chasing an escaped sheep! There are very few Island records for this showy plant. The botanist, Gladys Bullock, found it growing with Red Star-thistle in a field at Rowlands, Havenstreet in 1932.

**Narrow-leaved Ragwort** *Senecio inaequidens*

Four plants at Shalfleet shipyard, SZ414905 (PS).

**Ragweed** *Ambrosia artemisiifolia*

On waste ground associated with roadworks near St Mary's Hospital, Newport, SZ493904 (PS).

**Italian Bluebell** *Hyacinthoides* (*Scilla*) *italica*

A patch of flowering plants found besides a rural track near Kings Manor Farm, Freshwater with blue and white flowered plants on 7th April, SZ346878 (JA, det. PS). Well away from habitation. First Island record.

**Tufted Sedge** *Carex elata*

One clump on waste ground off Three Gates Road, Cowes, SZ490945 (PS). It is assumed that this an accidental introduction resulting from balancing pond construction; there are no historic records for this as a native species.

**Compact Brome** *Anisantha madritensis*

Ryde town centre, SZ596923 (MS). First modern record.

All photos by the author unless otherwise indicated.

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**Recorders**

| | | | |
|---|---|---|---|
| AJB | Andy Butler | AM | Anne Marston |
| CRP | Colin Pope | D&HT | Dave & Hazel Trevan |
| GG | George Greiff | JA | Jess Aldred |
| MS | Mark Spencer | ML | Mark Larter |
| PS | Paul Stanley | PSc | Paul Scott |
| RA | Robin Attrill | RL | Robin Lang |
| SO-M | Stephen Oakes-Monger | | |
| TS | Tony Stoneley | WH | Will Hannam |


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**Fig. 15 to 18:** Continued on page 93

# NEW AND INTERESTING FUNGI, ISLE OF WIGHT, 2020

***Colin R. Pope and Jackie Hart***

COVID 19 restrictions this year prevented us from holding our main foray, when visiting mycologists usually record many interesting and often new fungi, and has considerably restricted our opportunities to hold smaller forays with the fungi group. Nevertheless, we did hold a series of mini-forays and individuals reported interesting finds.

We had a long, hot, dry summer with September the hottest on record, meaning that the season got off to a late start. However, once the season was underway, although we did not see the abundance of fruiting bodies found in some years, a variety of fungi which are not often recorded were seen. The season extended well into December and some fungi prospered particularly well. There was, for instance, a great abundance of fruiting Honey Fungus (*Armillaria mellea*) and wood-rotting fungi appeared to do well.

There were six species first recorded for the Island in 2020. In addition, a first UK record made in 2019 but only recently determined as a result of DNA sequencing, is reported here.

Apart from records reported here, George Greiff has recorded many ascomycetes growing with mosses and liverworts. This is an under-recorded area of study and George has found many species new to the Island and some new to the UK. These will be the subject of a paper in a future volume of Wight Studies.

## AGARICS (Agaricomycetes)

### *Arrhenia peltigerina*

An uncommon small fungus which grows on old or decaying fronds of Dog's-tooth Lichen (*Peltigera*). It was found on 22nd November growing on *Peltigera canina* on St Helen's Duver (CP). It has previously been confirmed from this, its only Island site, in 2011.

### *Amanita alseides*

On 20th October 2019, Sue Rogerson found a specimen of an unusual Amanita in Firestone Copse which was identified and reported as *Amanita simulans.* She retained the specimen and, as there were only a handful of British records, material was sent to Sheffield University for DNA sequencing. The results gave a strong match for *Amanita alseides,* new to the UK. This identification has subsequently been confirmed and the record is accepted as the first British record.

**Fig. 1:** *Amanita alseides* Firestone Copse. Photo Sue Rogerson.

In 2010, the Hampshire Fungi Group collected and had confirmed a second UK collection of *A. alseides* from Hursley, between Romsey and Winchester in Hampshire.

### *Amanita strobiliformis* Warted Amanita

An infrequently recorded Amanita found during a foray in Parkhurst Forest on 4th November (fg). In this country it is confined to warm, southern woodland edges. It was last recorded by Dr Derek Reid in 1984 from Combley Great Wood.

**Fig. 2:** *Amanita strobiliformis* (Warted Amanita), Parkhurst Forest.

### *Clathrus ruber* Red Cage fungus

The Red Cage Fungus was found at Seaview on 2nd November (JH). Last recorded from Seaview in 1978.

### *Hygrocybe (Porpololomopsis) calyptriformis* Pink or Ballerina Waxcap

This is a very rare species in Europe but is a regular fruiter in certain sites with good, unimproved grassland in this country. We have found it regularly at Osborne House grounds, Northwood Cemetery, Fairlee Cemetery and Ryde Cemetery. A new site was found this year when Vidya Wolton brought to light an interesting waxcap grassland at St James' churchyard in East Cowes. It is quite a large waxcap, distinctive in its pink coloured sharp pointed cap. When mature, the cap splits and flares like a skirt.

### *Hygrocybe punicea* Crimson Waxcap

This impressive grassland waxcap is the largest waxcap, apparently sometimes getting to 15cm high with a cap equally wide! The intensely deep red cap is sticky,

the gills are widely spaced and the stem is thick, dry, coarsely fibrous and some combination of red, orange or yellow. This uncommon waxcap was found growing at a new site this year, St James' churchyard in East Cowes (VW).

***Hygrophoropsis aurantiaca var. albida***
a form of False Chanterelle

The False Chanterelle is a common and widespread fungus. Recent studies have shown that a number of closely related forms can occur. Var. *albida* is a white form which we found in quantity growing on wood chip at Northwood Cemetery on 31st October (fg). First Island record.

**Fig. 3:** *Hygrophoropsis aurantiaca* var. *albida*; on woodchip in Northwood Cemetery.

***Hygrophoropsis rufa***

This is closely related to the False Chanterelle, but a distinctively dark tan-orange species. It was at one time considered to be a mere variety of *Hygrophoropsis aurantiaca*, but recent DNA studies have shown that it is a distinct species Kibby (2012). It is currently under recorded and seems to be confined to conifer stumps and conifer woodchip. We recorded it in quantity of woodchip in Northwood Cemetery on 31st October (fg). First Island record.

**Fig. 4:** *Hygrophoropsis rufa* on woodchip in Northwood Cemetery.

***Leucopaxillus giganteus*** Giant Funnel

This giant mushroom was recorded in 2019 for the first time since 1976. In 2020 a few were found during a foray at Northwood Cemetery on 24th November (fg). Unfortunately, they were rather past their best.

**Fig. 5:** *Leucopaxillus giganteus.*

***Mycena adonis*** Scarlet Bonnet

This is an attractive little red capped bonnet fungus which we rarely find. There are just two previous records. We were delighted to find it (var. *coccinea*) during a foray at Sainham Woods, Godshill on 24th October (fg).

**Fig. 6:** *Mycena adonis.*

***Tricholoma cingulatum*** Girdled Knight

A distinctive grey coloured *Tricholoma* which unusually, has a prominent woolly ring around the stem and grows under willows. It was found during a foray at Martin's Wood, Newchurch on 10th November (fg). We have only had one previous modern record. Fig. 7 overleaf.

***Tulostoma brumale*** Winter Stalkball

This is an uncommon small lollipop-shaped puffball. It was recorded for the first time in 2010 in mossy grassland in Thorness Bay by Howard and Lesley Atkins. It was a surprise to find a few old specimens in a new site, short chalk grassland near the cliff edge on Tennyson Down on 7th January (CP). Fig. 8 overleaf.

**Fig. 7:** *Tricholoma cingulatum,* Martin's Wood, Newchurch.

**Fig. 8:** *Tulostoma brumale* Tennyson Down.

## TOOTHED FUNGI

***Hericium coralloides*** Coral Tooth

This nationally rare and spectacular tooth fungus was again seen on the fallen ash limb in Span Wood, Wroxall from where it was first recorded in 2015 (CP, reported by the owner).

## RUSTS & SMUTS

***Claviceps purpurea*** Ergot

We regularly find ergots on various species of grasses during the autumn but they are usually quite small. Common Cord-grass (*Spartina anglica*) growing in salt marshes is known to support particularly large ergots, far larger than on other grasses, and we record them most years. This year, an epidemic of ergot fungus appeared on Cord-grass on some of our saltmarshes, with well over half the inflorescences infected. This phenomenon has been recorded on other saltmarshes in the Solent (Raybould *et al.*, 1998). It is considered that the genetic variability of Common Cord-grass is very limited, having arisen largely by vegetative propagation. The very limited gene pool has enabled *Claviceps* to spread rapidly through the population when conditions are suitable. It has been hypothesised that the large ergots of *Claviceps purpurea* on *Spartina* are a specific physiological race originating from North America.

**Fig. 9:** Saltmarsh St Helens Duver

**Fig. 10:** *Claviceps purpurea on Spartina anglica.*

## ASCOMYCETES

***Cordyceps militaris*** Scarlet Caterpillar Club

This bright orange-red fungus is parasitic on buried butterfly and moth larvae. Natalie Bone found a specimen in grassland during a foray at Northwood Cemetery on 31st October (fg). We have only had four previous records.

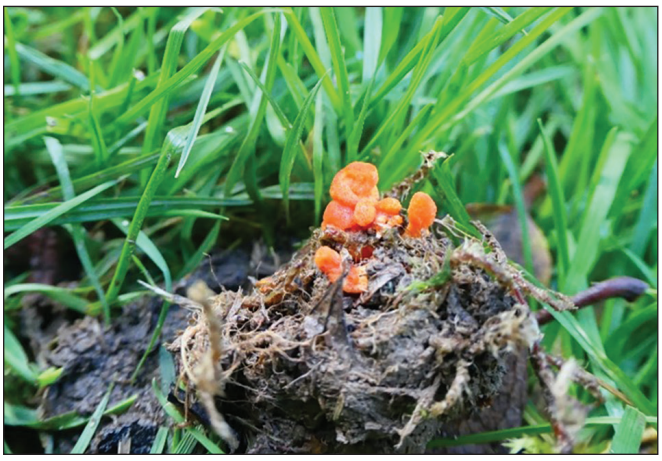

**Fig. 11:** *Cordyceps militaris* at Northwood Cemetery.

***Hymenoscyphus fagineus***

A small white stalked cup fungus growing on Beech cupules. Found in Sainham Wood, Godshill on 24th October (fg det CP). First Island record.

***Otidea bufonia*** Toad's Ear

An uncommon dark brown Hare's Ear with just one previous record. We were shown it by Ben Tonner on a foray at Northwood Cemetery on 24th November (fg).

**Fig. 12:** *Otidea bufonia* at Northwood Cemetery.

## MICROFUNGI

***Atopospora betulina***

A leaf spot on fallen Birch (*Betula*) leaves, found on a foray in Firestone Copse on 1st December (fg). First Island record but undoubtedly previously overlooked.

***Cercosporidium depressum***

A leaf spot found on Angelica (*Angelica sylvestris*) in Combley Great Wood on 23rd September (fg, det DB). First Island record.

***Perofascia lepidii*** A Downy Mildew

This downy mildew was found growing on Swine-cress (*Lepidium coronopus*) commonly in arable land at Atherfield Farm on 22nd June (CP). Although this was the first Island record, it has clearly been overlooked and it was subsequently found in other arable sites. Fig. 13

**Fig. 13:** *Perofascia lepidii* growing on Swine-cress, Atherfield.

**Recorders**

BT Ben Tonner
CP Colin Pope
DB David Biggs
fg Fungi Group
JH Jackie Hart
SR Sue Rogerson
VW Vidya Wolton

All photographs by the author, excepting where indicated.

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# BATS (CHIROPTERA), ISLE OF WIGHT 2019 AND 2020

***Colin R. Pope***

This report covers both 2019 and 2020, as the last published report was in 2018. A total of fifteen different bat species were recorded during 2019 and 2020. As usual, several house roosts were monitored by householders. In 2020, despite, or perhaps because of the pandemic, the Bat Hospital was kept busy with many bat calls dealing with 123 individual bats. I am grateful to them for allowing me to use their records in this report and to Donna Street for entering the records into Mapmate.

**Greater Horseshoe Bat** *Rhinolophus ferrumequinum*

Only recorded from Shide hibernaculum. There was one present on 10th January 2019 but not on 9th February. One was present on 22nd February 2020 was found to be using one of the bat hibernation boxes (C&JP).

**Daubenton's Bat** *Myotis daubentonii*

One was recorded from the Shide hibernaculum on the visit on 22nd February 2020. It was using one the hibernation boxes in the tunnel (C&JP).

The Bat Hospital received a single bat in 2019: a female was found grounded in Shanklin High Street on 23rd August and subsequently released. In 2019, a male was found flying inside of Boots the Chemist, in Newport High Street on 11th August and a female was found on Ryde beach on 23rd August. (GS). It is not unusual for Daubenton's Bats to be found in unusual circumstances, often in shops in towns, during August.

**Whiskered Bat** *M. mystacinus*

The long-established house roost at Pallance Road, Northwood was occupied in both 2019 and 2020 but the bats vacated the roost early. A maximum of 21 were counted on 22nd May 2019 (SC).

The Bat Hospital treated three grounded Whiskered Bats in 2019: a male was grounded in Union Street, Ryde on 27th July; a male was grounded at Mill Lane, Yarmouth on 1st August; and an adult female was grounded at East Cowes on 15th September. In 2020, a male was grounded at Gatehouse Road, Ashey on 23rd April; a female was killed by a cat at Godshill on 4th July; a male was brought in by a cat at Pallance Road, Northwood on 27th august; and a female was found beneath wooden cladding of a building at Rew Street on 12th October. (GS).

**Brandt's Bat** *M. brandtii*

Two individuals treated by the Bat Hospital in 2020 were considered to be this species rather than the similar Whiskered Bat. A grounded female was found at Apse Manor Road, Shanklin on 1st April and another female was found flying in the stairwell of a house along The Mall, Brading on 15th September (GS).

**Natterer's Bat** *M. nattereri*

One was found in Shide tunnel hibernaculum on 9th February 2019 occupying one of the bat hibernation boxes. One was present in a different hibernation box on 22nd February 2020 (C&JP).

Individuals were caught during mist net/harp trap surveys in 2019. There was an adult female on 23rd May and an adult male on 14th June off Nicholson Road, Elmfield, Ryde (IDW). Two were trapped during surveys in Priory Woods, St Helens on 7th August and one on 12th September (DW).

The Bat Hospital treated two bats in 2019: an adult male grounded at Northcourt, Shorwell on 24th April; and an adult female grounded at Fishbourne on 21st August. In 2020, a dead adult male was reported from Little Kennerley Farm on 23rd November and another was killed by a cat at Solent View Road, Cowes on 3rd December. (GS)

**Bechstein's Bat** *M. bechsteinii*

Only one record in the past two years. The Bat Hospital treated one individual in 2019, an adult male grounded at Rolls Hill, Thorness on 31st December, suggesting it had been disturbed from hibernation. None were dealt with in 2020.

**Noctule** *Nyctalus noctula*

The Havenstreet Station Cottage house maternity roost continues to hold both Noctule and Serotine bats. The highest count of Noctules was 23 on 14th June 2020 (JL).

One was trapped by mist netting in Priory Woods, St Helens on 7th August 2019 (DW). Bat passes of foraging and commuting Noctules were recorded regularly by ecologists conducting surveys of hedgerows, pasture and woods at Preston Farm, Elmfield, Ryde between August and October 2019.

No Noctules were treated at the Bat Hospital in 2019 or 2020.

**Serotine** *Eptesicus serotinus*

The long-established maternity house roost in Lower Adgestone Road, held improved number in 2020: 48 were counted emerging on 24th June (JG). The Havenstreet Station Cottage house maternity roost continues to hold both Noctule and Serotine bats. The highest count of Serotines was 38 on 23rd June 2020 (JL).

The Bat Hospital received four bats in 2019 and five in 2020. A particularly interesting record was an adult male found at Chiddles Farm, Kern Lane, Alverstone on 29th August 2019. During the visit, Graham located a roost in the adjoining converted barn. This was a known Serotine nursery roost at the time that the barn was proposed for conversion, and planning conditions were put in place in order to try to ensure that the roost was retained. Another interesting record was a grounded bat found in a bus shelter at Godshill on 15th August 2020. This bat was ringed and from the information it was found that the bat had been ringed as a juvenile female by James Agetter on 3rd August 2010 at a nursery roost in Watergate Road, Newport.

**Pipistrelle** *Pipistrellus pipistrellus / P. pygmaeus*

Both Common and Soprano Pipistrelles were trapped during mist netting in Priory Wood, St Helens in 2019. On 7th August, 14 Common Pipistrelle and six Soprano Pipistrelles were caught; on 12th September, one Common Pipistrelle and six Soprano Pipistrelles were caught (DW).

Pipistrelle bats are the most frequently treated at the Bat Hospital. In 2019, 79 bats were dealt with (including one Soprano Pipistrelle) and in 2020, 88 bats were dealt with (including seven Soprano Pipistrelles).

**Nathusius' Pipistrelle** *Pipistrellus nathusii*

One was trapped by mist netting in Priory Woods, St Helens on 7th August 2019 (DW). None were treated at the Bat Hospital in 2019 or 2020. During 2019 and 2020, Adrian Bicker has been carrying out a study investigating the migratory patterns of Nathusius' Pipistrelles along the south coast of England and the north coast of France using Audiomoth acoustic loggers set up in various locations for long term acoustic monitoring. He has utilised a number of sites on the Island. Preliminary findings indicate that there is an autumn movement of bats from the Baltic along the south coast, including the Solent coast of the Island. There is also a late April movement from the French coast across the Channel, with many reaching the southwest coast of the Island and moving north along river valleys. The assumption is that these bats are heading back to the Baltic. There is also another, as yet unexplained, pulse of activity on the Island coasts in late May/early June.

**Kuhl's Pipistrelle** *Pipistrellus kuhlii*

Over the past twenty years there have been around 20 records of Kuhl's Pipistrelle in this country, including five from the Island. Most of these have been along the south coast and the bat is considered to be a vagrant species.

**Fig. 1:** Juvenile male Kuhl's Pipistrelle at The Bat Hospital. Photo Graham Street.

**Fig. 2:** Juvenile male Kuhl's Pipistrelle at The Bat Hospital. Photo Graham Street.

In 2020, there were three intriguing records (Briggs & Morris, 2020). In June, a grounded female was found on the beach at Dungeness Bird Observatory in Kent which subsequently gave birth in captivity. This was shortly followed by the discovery of a grounded juvenile on 8th August at Merstone on the Island (GS). Fig. 1 Estimated to be around six weeks old, this individual was most likely making its first attempts at flight, which suggests that it would have been born in the near vicinity. Donna Street was not at first aware that this bat was anything different, until she discovered that it would not interact with other juvenile pipistrelles in captivity at the Hospital

When it was test flown in September it was noted that the bat had a distinctive white trailing edge to the wing, suggesting that it was a Kuhl's Pipistrelle (Fig. 2). This was subsequently confirmed by Tony Hutson.

Following this remarkable find, later in August, another grounded female was found at Samphire Hoe in Kent which was believed to be one of this year's young. Taken together, this suggests that this vagrant species is a recent colonist and may now be breeding along the south coast.

**Brown Long-eared Bat** *Plecotus auritus*

Six were caught in mist net surveys at Priory Woods, St Helens on 7th August (DW)

Considering this is one of our commonest bats, generally, rather few individuals are treated at the Bat Hospital in any one year. Ten individuals were treated in both 2019 and 2020.

**Grey Long-eared Bat** *P. austriacus*

This rare bat tends to be reported to the Bat Hospital during the late summer/early autumn. The Bat Hospital dealt with two individuals in 2019, both adult females. On 7th August, one was grounded at Chiddles Farm, Kern Lane, Alverstone and on 7th September one was grounded at Grange Road, Shanklin. Both were able to be released.

In 2020, five individuals were treated: On 21st August one was reported on a wall at Carisbrooke Castle; on 1st September one was found outside a business in High Street, Bembridge; on 17th September one was grounded at Firestone Glade, Wootton; on 22nd September one was found at Osborne House; and on 30th November a juvenile was grounded at Sandown High School. (GS).

**Barbastelle** *Barbastella barbastellus*

One was trapped during mist netting at Priory Woods, St Helens on 12th September 2019 (DW). Barbastelle bat passes were recorded by ecologists conducting surveys at Preston Farm, Elmfield, Ryde in 2019. Jon Whitehurst and members of the Isle of Wight Bat Group have been carrying out audio surveys in the northern half of Parkhurst Forest to inform Forestry England who are proposing thinning works in late 2021.

In 2019, three were dealt with by the Bat Hospital: on 29th April, an adult female found on a footpath at Apse Heath; on 21st August, an adult male grounded in Victoria Street, Ventnor; and on 4th October, an adult male grounded at Crocker Street, Newport. All but the Newport individual were successfully released.

In 2020, there were also three individuals at the Bat Hospital. On 9th April, a dead adult female was reported at Binstead; on 7th May, an adult male was grounded at Pump Lane, Calbourne; and on 11th August, an adult female was found at Quay Lane, Brading, which had become entangled in thistles and brambles. The last two were successfully released. (GS).

**Acknowledgements**

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# NOTABLE MOTHS, ISLE OF WIGHT 2020

***Jim R. Baldwin***

A slight increase in the number of records received, compared to 2019, was helped by a monumental effort by Iain Outlaw whose 7,629 records represented approximately 50% of the total.

A quiet start to the recording year was not helped by the pandemic-enforced lockdown preventing any trapping away from the garden. *Paracrania chrysolepidella* was a new record for the vice-county in April, while Lunar Double-stripe *(Minucia lunaris)* at Ningwood Common in May was the highlight of the spring migration and a welcome addition to the county list. Three records of *Agrotera nemoralis* at the end of May were followed by four further records in June.

Other June highlights consisted of three new county records: *Ethmia quadrillella* was seen, and photographed, during daylight at Alverstone, while Rose Plume *(Cnaemidophorus rhododactyla)* and *Epinotia nanana* were recorded at Shanklin on 24th June. July and August saw a single *Agrotera nemoralis*, eight Plumed Fan-foot *(Pechipogo plumigeralis)* and two *Acrobasis tumidana*. The August highlights were both recorded at Bonchurch with Marsh Dagger *(Acronicta strigosa)*, five years after the first sighting at the same site, and a Small Ranunculus *(Hecatera dysodea)* which was a likely immigrant rather than from the south-east Hampshire population. Other August records of note included Beautiful Marbled *(Eublemma purpurina)*, four records of *Ethmia quadrillella* and Slender Burnished Brass *(Thysanoplusia orichalcea)* at Shanklin.

September saw two further county records: *Selania leplastriana* at Freshwater Bay and *Elachista consortella* at Totland. October saw the two records of the year of Dewick's Plusia *(Macdunnoughia confusa).*

**New vice-county records**

All were recorded at light unless otherwise stated and species were confirmed by dissection where necessary.

**2.002 *Paracrania chrysolepidella*** (Zeller, 1851)

The scarcest and most local of the Eriocrania species in Britain. Recorded regularly from two sites in Hampshire. One was trapped at Shanklin on 2nd April.

**15.060 *Phyllonorycter ulicicolella*** (Stainton, 1851)

A Nationally Scarce species found in heathland and grassland in southern England and also northwest England. A mine, containing larva, found on young shoots of Common Gorse *Ulex europaeus* at St Helens on 19th September.

**15.0931 *Phyllocnistis citrella*** Stainton, 1856

An adventive species found on imported Citrus plants. A vacated leaf-mine on a potted Citrus Lemon Citrus x limon at a Freshwater garden centre on 22nd September.

**28.008 *Metalampra italica*** Baldizzone, 1977

This is a very rare immigrant or adventive species which is spreading rapidly in England. First recorded in Devon in 2003 when it had not previously been reported outside of Italy. One trapped at Bonchurch on 5th August.

**33.002 *Ethmia quadrillella*** (Goeze, 1783) Fig. 1

A Nationally Scarce species which was first found in Hampshire in 2012. One seen at Alverstone on 8th June (daytime observation), with a further four records in August at Wheeler's Bay, Bonchurch and Shanklin.

**38.048 *Elachista consortella*** (Stainton, 1851)

A Nationally Scarce species found on grassland. One was trapped at Totland on 18th September.

**45.022 Rose Plume** *Cnaemidophorus rhododactyla* ([Denis & Schiffermüller], 1775) Fig. 2

This is a Nationally Scarce and local species in the British Isles, occurring only in South-east England. One recorded at Shanklin on 24th June.

**Fig. 1:** *Ethmia quadrillella.* Photo Ricky Ashanollah

**Fig. 2:** Rose Plume *(Cnaemidophorus rhododactyla).* Photo Iain Outlaw

**49.242 *Epinotia nanana*** (Treitschke, 1835)

A Nationally Scarce species, the smallest of the British Epinotia species, which is possibly under-recorded. A female came to light on 24th June and a male on 25th June, both at Shanklin.

**49.346 *Selania leplastriana*** (Curtis, 1831) Fig. 3

A Nationally Scarce and local species, restricted to coastal localities in Kent, Dorset and South Devon. One trapped at Freshwater Bay on 15th September. There were a further four daytime observations, when it was found on its foodplant Wild Cabbage *Brassica oleracea*, from the same area between 16th-21st September.

**Fig. 3:** *Selania leplastriana.* Photo Phil Barden

**72.086 Lunar Double-stripe** *Minucia lunaris* ([Denis & Schiffermüller], 1775) Fig. 4

This is a rare immigrant from southern Europe. One was trapped at Ningwood Common on 20th May.

**Fig. 4:** Lunar Double-stripe *Minucia lunaris.* Photo Jamie Marsh

**73.280 Small Ranunculus** *Hecatera dysodea* ([Denis & Schiffermüller], 1775)

A Red Data Book species which became extinct in Britain by 1941. It is now re-establishing itself along the south-east coast. One recorded at Bonchurch on 18th August was thought to be an immigrant rather than from the small population in south-east Hampshire.

The following are a few of the other notable records

**12.019 *Nemapogon ruricolella*** (Stainton, 1849) Recorded only once before, in 1934. One trapped at Parkhurst Forest on 28th July.

**30.002 *Agnoea subochreella*** (Doubleday, 1859)

Two specimens at Sandpit Copse on 20th May made the fourth record for the Isle of Wight. First recorded at Newtown in 1969, there have now been three further records since May 2019.

**37.050 *Coleophora albidella***
([Denis & Schiffermüller], 1775)

The fourth county record was one trapped at Parkhurst Forest on 29th June.

**37.086 *Coleophora versurella*** Zeller, 1849

One at Ventnor on 29th September was the first to be recorded on the Isle of Wight since 1938.

**49.363 *Pammene argyrana*** (Hübner, [1799])

One at Shanklin on 18th April was the fourth county record.

**62.033 *Acrobasis tumidana***
([Denis & Schiffermüller], 1775)

Singles at Shanklin on 31st July and 9th August. Originally recorded in 1873 and 1900, it was not seen again until 2003. Since 2014, there have been eight records of this species.

**63.041 *Agrotera nemoralis*** (Scopoli, 1763)

Singles at Bonchurch on 27th, 29th & 30th May, 2nd & 8th June. One at Haseley Manor on 9th June, three at Shanklin on 13th June and a single at Shanklin on 1st July. First recorded in 2015, this species has been reported annually since 2017.

**72.074 Beautiful Marbled** *Eublemma purpurina* ([Denis & Schiffermüller], 1775)

After two records in 2018, there were five reports of this immigrant species from southern Europe in 2020. Singles at Bonchurch on 8th August, Shanklin on 20th August, Wheeler's Bay on 16th September and Freshwater Fruit Farm on 19th & 21st September.

**72.081 Dark Crimson Underwing**
*Catocala sponsa* (Linnaeus, 1767)

An exceptional year for this species with five records, making a total of 14 recorded since 1893. Singles at Shanklin on 6th July, at Firestone Copse on 21st July and at Bonchurch on 6th, 9th & 11th August.

**72.082 Light Crimson Underwing**
*Catocala promissa* ([Denis & Schiffermüller], 1775)

One at Shanklin on 25th June was the first record since 2018 and only the twelfth for the Island.

**73.004 Slender Burnished Brass**
*Thysanoplusia orichalcea* (Fabricius, 1775)

A male trapped at Shanklin on 23rd August was a fifth record for the Isle of Wight, and the first since the celebrated lepidopterist Bernard Skinner took one at Totland in 2006.

**73.010 Dewick's Plusia**
*Macdunnoughia confusa* (Stephens, 1850)

This immigrant species was first reported in 2001 and has been recorded annually since 2016. Singles captured at Bonchurch on 5th & 22nd October.

**73.041 Marsh Dagger** *Acronicta strigosa*
([Denis & Schiffermüller], 1775)

One at Bonchurch on 7th August was the second

county record, five years after the first sighting at the same site. This is only the sixth record of this species as a suspected immigrant in Britain. It formerly bred in this country but was last recorded in 1933 and is now thought to be extinct.

**Acknowledgements**

My thanks to everyone who submitted records in 2020, in particular Phil Barden, Andy Butler, Sue Davies, James Halsey, Chris Hicks, the late Sam Knill-Jones, Jamie Marsh, Ellie Ness and Iain Outlaw. Additional thanks to those who provided photographs for this report. I would also like to thank the Forestry Commission, National Trust, People's Trust for Endangered Species and Royal Society for the Protection of Birds for allowing access to their estates.

It is also an opportunity to thank Iain Outlaw for his brilliant work as County Moth Recorder for the past six years. His unwavering enthusiasm, friendly attitude and attention to detail, plus an encyclopaedic knowledge of moths, made him the perfect candidate for the role. He is a difficult act to follow, and I offer my grateful thanks to both Iain and James Halsey for their support and advice.

Finally, we lost one of our most experienced Lepidopterists on the Isle of Wight in 2020 when Sam Knill-Jones passed away on 3rd August at the age of 77. His obituary appears below, but it was fitting that such a character should be trapping right to the end of his life. He will be greatly missed by fellow entomologists, both locally and nationally, being a former County Moth Recorder for the Isle of Wight. He recorded around 100 new species for the Island, including two new species for Britain.

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## SAMUEL ALAN KNILL-JONES (1942-2020)

Sam was born in Freshwater where his father was a General Practitioner. He commenced his 'career' in entomology aged seven and left an account that follows below. He attended Malvern College, and being musically gifted, later studied oboe at the Royal College of Music. He worked in banking in Romsey and later as Senior Executive Officer for the Associated Board of the Royal Schools of Music. In the 1980s Sam moved back to the Island, firstly to Brooklands where he looked after his mother, and later to a cottage in Moons Hill.

Sam was the Lepidoptera Recorder for the Isle of Wight for more than 16 years and published annual reports in the IWNHAS Proceedings. There were some sixteen annual reports of 'Notable Moths taken in the Isle of Wight' and at least another three papers on other subjects.

There were also many letters (about 35 were found in his files) published in the County Press over the years, on subjects varying from 'notable captures' to 'late Raspberries' and 'Roses flowering in December'.

Another thirty articles and notes appeared in Entomological Journals between the 1960s and the 1990s. As this was before online access was commonplace, they attracted requests for reprints, from nine countries as far afield as Iran, Japan and Canada.

Two articles gave evidence about global warming, derived from years of observations on the earlier and earlier emergence dates of butterflies on Afton Down and at the small car park called Whiteways on the chalk between Freshwater Bay and Compton. On one occasion, as he wielded a net, Sam was challenged there, by either a member of the public or a ranger, neither of whom could have appreciated the nature of the observations being made which were critical evidence for these papers. Sam, being a man of few words in unfamiliar situations, said nothing and put the net away. However, his regular observations resumed a few days later.

Sam ran moth trapping evenings for the Society from his home. He also sang bass in the Isle of Wight Cantata Choir for over 25 years and would discuss lepidoptera and cricket with anyone who called. He was a member of the British Entomological and Natural History Society for over 50 years, and regularly attended the Annual Exhibition held in London in November. His last attendance was in 2018. The Yarmouth Ferry was not running on the morning of the 2019 meeting and he was unable to travel to meet his brother and friends, nor stay for the weekend.

**An Entomologist's Memories by Sam Knill-Jones**

At the age of five my brother Robin, who was two years older than me, started to catch Cabbage Whites in the garden with 'our' hands. This began our interest in collecting butterflies. Our next-door neighbour, Dr Mansfield who was my father's predecessor as the doctor at Brooklands had a collection of butterflies & moths mostly

collected from the Cambridge area and he was a great inspiration to us. He gave us a net and pill boxes and after a time he let us have his small cabinet full of Lepidoptera which really inspired us to form a collection.

My father, grandfather and uncle also collected in their youth and my grandfather gave us several storeboxes of moths. Uncles also gave me papered butterflies collected during WW2 from the Far East, including Rangoon, which I mounted in display boxes and distributed amongst the family. My first notable capture was in 1949, when at the age of seven, I caught the only second Island record of the Lulworth Skipper in the front garden, over the bed of geraniums. In 1952 my brother captured one of a pair of Long-tailed Blues which were flying over wild pea at the front of our house Brooklands.

Our enthusiasm for collecting prospered and in 1955 my father bought us one of the early metal Robinson mercury vapour moth traps from Watkins & Doncaster for the princely sum of £13 12s 6d. The following year I caught an American Painted Lady on August 19th in the garden and on the same night we captured a Three Humped Prominent. Both species were the twelfth ever to be recorded in the British Isles and it was surely a great red-letter day. At about this time, we visited Dr Blair with our rarities to hand. We were ushered into his house which overlooked Freshwater Marsh by his petite wife and taken to his upstairs study. This room was filled with cabinets, and on the window shelf stood his moth trap which consisted of a high voltage electric light bulb. It was good to meet this eminent entomologist and he gave us further encouragement to continue collecting.

Sam hard at work sorting out a night's catch.

Before my father died in 1963, we were visited by the well-known entomologist Dr Bernard Kettlewell and he came to have dinner with us at Brooklands. He was a charming man and we fed him on crab salad which we had caught in a drop net on Totland pier. This happened to be one of his favourite dishes and the evening with him was a great success. My brother and I visited him at Oxford University on our way to school at Malvern College and he showed us his containers of Peppered Moth larvae. He was, of course, the leading authority on industrial melanism. It was through us that he later sent his son to Malvern College.

Another entomologist who visited us at this time was Robin Mere, a solicitor from Surrey. On a night collecting on Tennyson Down, we returned by car around midnight to Brooklands. As we were getting out of the car, we heard the sound of breathing coming from the back seat of the car. Then to our amazement we noticed a bearded tramp dressed in a long thick coat lying on the back seat. Few words passed between us and he slowly got out of the car and walked out of our drive into the middle of Freshwater. This was certainly our greatest capture ever! Other visiting entomologists at that time were Dr John Bradley who was an authority on the British *Tortricidae* and Teddy Pelham-Clinton, from Edinburgh, who later became the Duke of Newcastle.

In early October 1963, shortly after my father's death I had the pleasure of a visit of two experienced entomologists Mr E.J. Hare & Mr D. Nore. On showing them my recently acquired collection of Irish insects, they remarked that my so-called Flounced Rustics resembled the Sandhill Rustic which used to occur on the sandhills at Rhyl, Flintshire, and St. Anne's-on-Sea on the Lancashire coast. That same week I took these insects along to the British Museum (Natural History) where Mr D.S. Fletcher kindly identified them as the Sandhill Rustic (*Luperina nickerlii*). However, they appeared much darker than the continental examples, and we decided to send them to Mr Charles Boursin of Paris, who is the authority on this family. In December 1963, Charles Boursin confirmed that these *Luperina nickerlii* were, in fact, a new subspecies and he named them ssp. *knilli* in the memory of my father.

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with Sam Knill-Jones' own observations on his entomological recording.

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# ODONATA, ISLE OF WIGHT 2020

***Jim R. Baldwin***

Despite being in lockdown at the start of the 2020 recording season, there was a welcome increase in records with 1,170 received, the highest total since 2006. Twenty-five species of Odonata were reported, which equalled the previous best year of 2007.

There was a new species recorded for VC10 with the first confirmed records of Southern Migrant Hawker *(Aeshna affinis)*. The sightings on 30th July of a single male at Bouldnor and at Briddlesford Woods were the undoubted highlight of the year.

Unsurprisingly, garden pond sightings provided the majority of the records in April and early May. The first record of the season was a newly emerged Large Red Damselfly *(Pyrrhosoma nymphula)* at Niton on 8th April. This was the earliest emergence date reported for this species since 2012.

The exceptionally warm weather in early spring produced several other phenology records for earliest reported dates for species as detailed below.

The final record of the year was a Common Darter *(Sympetrum striolatum)* at Bembridge Lagoons on 12th November.

The taxonomic sequence and nomenclature follow Schorr and Paulson (2020).

**Southern Emerald Damselfly** (*Lestes barbarus)*

The small breeding colony at Bouldnor was again well monitored by Peter Hunt, but was only seen on five dates, with a maximum of four seen on 30th May. The first record of the year was on 25th May, which equalled the earliest reported sighting of this species for the vice-county. A male was seen on 13th June and three on 20th. There were no further reports until 20th August, when a lone female was located a distance from the two breeding scrapes which had dried out by then. This constituted the last record of the year for this species. Although fewer sightings were reported, it is hoped that the colony will remain viable to breed at this site.

**Banded Demoiselle** *(Calopteryx splendens)*

A female seen in Martin's Wood on 13th May was the earliest record of this species for the Isle of Wight.

**Southern Migrant Hawker** *(Aeshna affinis)* Fig. 1a & 1b

As previously mentioned, a single male was seen at Bouldnor and Briddlesford Woods on 30th July which was the first confirmed record of this species for the Isle of Wight. They remained at both sites with two males being seen at Bouldnor on 6th August and the last report of a single male on 11th. At Briddlesford, the maximum reported were four males on 1st August with the final sighting of a single male being chased by a male Emperor Dragonfly *(Anax imperator)* on 12th August. This species is a recent colonist with a well- established breeding population in the Thames Estuary. There appears to be an increase in migrants along the south coast which would account for our records. As the species likes breeding in ponds with vegetation and low water levels, like the Southern Emerald Damselfly, it is possible that it could breed on the Isle of Wight in the future.

**Fig. 1a:** Southern Migrant Hawker *Aeshna affinis* (Jim Baldwin)

**Fig. 1b:** Southern Migrant Hawker *Aeshna affinis* (Jim Baldwin)

**Emperor Dragonfly** *(Anax imperator)* Fig. 2

There was an odd record of a male Emperor Dragonfly attempting to mate with a female Hairy Dragonfly at one of the ponds at Rocken End on 2nd June (Fig 2). Although damselflies have been recorded mating with mixed species, there appears to be no record of two species of the Aeshnidae family in the UK. Normally an Emperor Dragonfly would be catching a Hairy Dragonfly as its prey! Thankfully, the breeding attempt would not be successful.

**Hairy Dragonfly** *(Brachytron pratense)* Fig. 2

The early spring weather possibly contributed to a record number of sightings for this species with the first seen on 21st April, a new county record, from no

**Fig. 2:** Emperor Dragonfly *Anax imperator* and Hairy Dragonfly *Brachyton pratense* (Graham Sherratt)

less than three locations: Newchurch, Rookley and Sandown Meadows NR.

**Downy Emerald** (*Cordulia aenea)*

After no records of this species in 2019, it was pleasing to receive a record number of sightings from seven sites, including one on private land in the East Wight where it was last reported in 2010. The first sighting at Dickson's Copse on 7th May was the earliest county record for this species.

**Broad-bodied Chaser** *(Libellula depressa)* Fig. 3

It was a good year for the species with new early and late county records. One emerged from a garden pond in Carisbrooke on 14th April while a pristine male appeared at a garden pond in Shanklin on the comparatively late date of 23rd August and was last seen and photographed on 1st September.

**Scarce Chaser (***Libellula fulva)*

Scarce Chaser had a bumper season along the Eastern Yar Valley with a record number of sightings and a record count of 16 at Newchurch Moors on 26th June. It was also the earliest (18th May) and latest (29th July) reports for the county of this species. There was an interesting record of an immature female photographed at a new site, on private land, in the East Wight.

**Keeled Skimmer** *(Orthetrum coerulescens)*

Fewer records were received this year as there were only two visits to the main site at Blackgang Terrace, mainly due to the difficulties of access. Therefore, it is not possible to ascertain how the population is faring.

**Red-veined Darter** *(Sympetrum fonscolombii)*

After breeding activity was observed for the past two years, it was disappointing that there were only two records of this species in 2020. Two mature males at the usual reservoir in the Atherfield area on 14th June were possible migrants and the only other record was a male at the same site on 20th July.

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**Fig. 3:** Broad-bodied Chaser *Libellula depressa.* (Kathy Williams)

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# DINOSAUR ISLE MUSEUM: A YEAR IN REVIEW

***Alex Peaker***

**Introduction:**

Dinosaur Isle Museum was opened in 2001 and holds the collection that was originally founded by the Isle of Wight Natural History Society in the early 1800s. Since its beginning, the collection has grown extensively. Now comprising of the remnants of at least four museums, Dinosaur Isle holds over 11,000 separate accessions representing nearly 2,500 different taxa or samples. All but a few of these have been found on the Isle of Wight.

The exposed geology of the Isle of Wight shows a mostly complete sequence of approximately 75 million years. This dates from the Barremian (Early Cretaceous, approximately 125mya) through to the Rupelian (Late Paleogene, approximately 32mya) with a small gap caused by an erosive period in the Late Cretaceous/ Early Paleogene. Because of the time period the rocks formed in, their highly fossiliferous nature, and the location in which they formed, the Isle of Wight has produced a wide array of internationally important fossils, many of which are held by Dinosaur Isle.

This report aims to give an update on the collection of Dinosaur Isle Museum, focussing on the donations that were made in 2020 and the recent research that has been carried out on the collection. The summary of research includes work that was in publication in 2020 which either cites or figures the museum and its collection.

**Recent donations to Dinosaur Isle Museum**

A total of 46 accessions have been made at Dinosaur Isle throughout 2020, a relatively small amount compared to other years and likely to be related to Covid-19. None the less, we have still received spectacular donations and much research has been carried out on our collection.

During 2020, three holotypes and one neotype were added to, or recognised within, the collection. The holotypes are of the dinosaur *Vectaerovenator inopinatus* gen. et sp. nov. (Barker, 2020) and the pterosaurs *Wightia declivirostris* gen. et sp. nov. (Martill, 2020) and *Uktenadactylus rodriguesae* sp. nov. (Holgado, 2020). The neotype specimen is of the crab *Portunus vectensis* (Quayle, 2020). In total specimens held within the collections of Dinosaur Isle have been cited or figured in 14 separate articles through the year.

**Summarisation of type specimens**

Type specimens are those that are chosen to be representative of a taxon. There are several different forms of type; in this article, holotypes and neotypes are relevant. A holotype is the specimen that has been used to describe a new taxon. A neotype is a specimen that has been designated as a replacement if a holotype can no longer be recognised.

Vectaerovenator was initially discovered in March 2019 when an individual cervical vertebra was discovered on the beach at Shanklin. Between then and March 2020, a total of six vertebrae were found and donated to the Museum. As of yet, no further material of this animal has been recognised.

The cliffs of Shanklin are dominated by the Lower Greensand Group, a unit that was mostly deposited in a marine environment, making dinosaur finds quite rare. Vectaerovenator is the most recent significant dinosaur remains found in the vicinity of Shanklin since the sacrum and partial pelvic girdle of a sauropod were discovered near Luccombe Chine in 1945.

From the late Barremian/Early Aptian a large scale marine transgression occurred and eventually covered most of Europe in seas. This gave rise to the swathes of Chalk that can be seen across Southern Britain and much of the continent. Other than the dinosaurs of Romania, late Cretaceous dinosaurs are quite rare in Europe. Vectaerovenator is one of the youngest dinosaurs to have been found on the Island and is the youngest diagnosable non-avian theropod to have been discovered in Great Britain

In terms of the description of a new genus, six vertebrae is very little material. Autapomorphies (distinctive features that on their own or together are specific to a taxon) of Vectaerovenator are mostly the positioning of pneumatic features of the cervical and dorsal vertebrae (Fig. 1). A combination of the age, paleogeography, and lack of similar contemporaneous fossils from other locations has also helped the designation.


**Fig. 1:** Left-lateral view of an early dorsal vertebra showing a deep pneumatic foramen. Scale in mm.

*Wightia declivirostris* was found at Yaverland in 2019 and was recognised by Martill *et al.* (2020) as being the first example of a tapejarid pterosaur on the Isle of Wight. It is represented by fused partial premaxillae. The whole specimen is less than 5cm in length and shows the characteristic features of a lack of teeth and slit like foramina, (passages through the bone for blood vessels) allowing it to be recognised as a tapejarid. A combined angle of downturn in the premaxillae along with the length between downturn and projected tip has allowed the specimen to be recognised as a new genus.

*Uktenadactylus rodriguesae* has been recognised in the collection from a specimen initially found in 2014. Originally identified as the first occurrence of Coloborhynchus on the Isle of Wight it has been confirmed more recently as a new species. The specimen itself is a small portion (it is less than 50mm at its greatest dimension) close to the tip of the rostrum. However, specific features found in this piece of bone have shown the fossil to be a second species of Uktenadactylus. The only other species of Uktendactylus (*U. wadleighi*) is represented by a specimen found in Texas from slightly younger deposits.

In 2018, a well-preserved example of the crab *Portunus vectensis* was found on the beach at Hamstead. Fossil arthropod material is rare at this locality but occasionally specimens can wash out from the Cranmore Member exposed at the top of the cliff.

The holotype for *P. vectensis* (Carter, 1898) was held by the Sedgwick Museum (Cambridge) but can no longer be found within the collection. Incomplete specimens are held in the collections of Dinosaur Isle Museum and the Natural History Museum (London) and have not warranted description. The completeness of the new specimen allowed the new description, and due to the holotype no longer being recognised within collections, the new specimen was designated the neotype.

**A review of publications citing or figuring the Museum or its collection**

Evers and Joyce (2020) give a new description of the turtle *Sandownia harrisi*. Represented by a nearly complete skull (Fig. 2) and mandible found in the 1931 at Atherfield, this specimen is likely one of the best preserved vertebrate remains to have come from the Island's Lower Greensand. Aside from the re-description of the specimen, the paper discusses the phylogenetics of Sandownia. As it is likely to be a secondarily marine turtle, that is, evolutionarily an animal that has evolved from inhabiting the sea, to the land, and back to the sea again, it has the potential to give better understanding of extant sea turtles.

With the skull of Sandownia, acid preparation was used to remove matrix from the bones to show the full detail. This most recent description has used X-ray computed tomography (X-CT) to show sutures between bones more readily (Fig. 3) and recognise interior details that cannot be seen (Fig. 4).

The principle of an X-CT scan is that multiple, parallel x-rays are taken of the object and then stacked to create a 3D image. The number of images that are stacked will depend on the resolution of image needed.

**Fig. 2:** *Sandownia harrisi* skull in dorsal view.
The image was taken with a standard light camera.

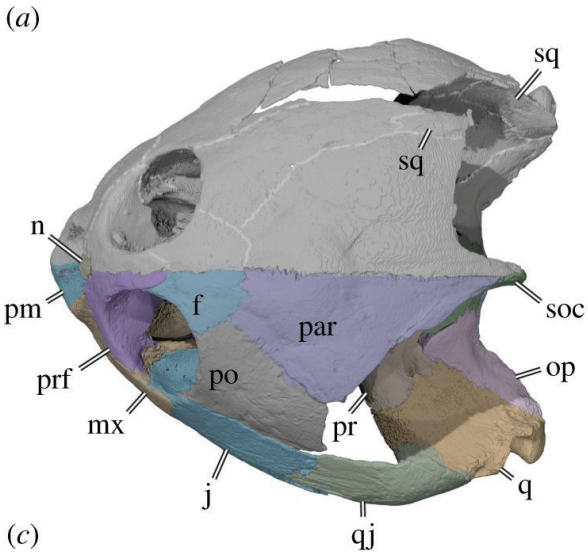


**Fig. 3:** CT image of the Sandownia harrisi skull in dorsal view.

X-CT scans are commonly used in the medical world, and their use in palaeontology can present a novel challenge. An X-ray can be used to create an internal image as denser material absorbs more radiation than a less dense material. For example, when scanning a human body, the bones will absorb more radiation than other organs. The amount of radiation that passes through the body will therefore create an image of the body based on density; so long as what you are trying to see possesses varying densities then the X-rays will create an image.

With fossils , this can present a problem as they can often be too dense. A common form of fossilisation is pyritisation; that is the replacement of the original material with pyrite, a mineral made of iron and sulphur. If a fossil is more heavily pyritised (or replaced by any particularly dense material), either through replacement of the original material or the infill of voids such as blood vessels, then the fossil can become dense to the point that not enough radiation will pass through to create an image. This can be negated by using higher power X-rays, but this comes at the cost of resolution, and

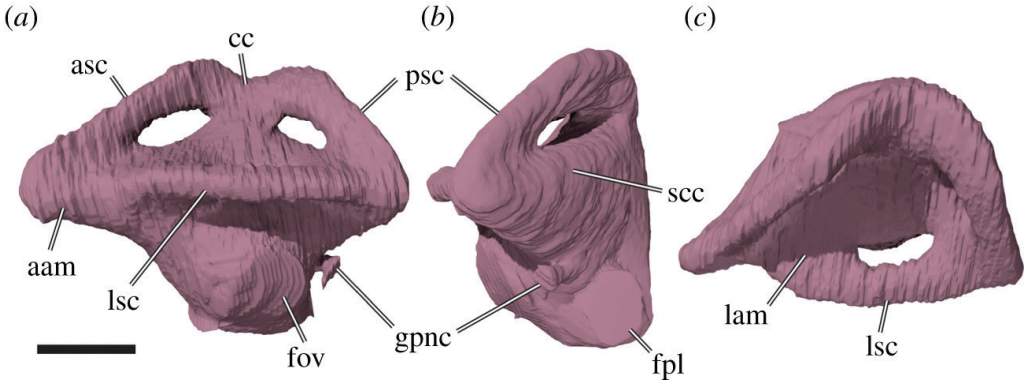


**Fig. 4:**
CT render of the endosseous labyrinth of *Sandownia harrisi*.
*a Lateral view*
*b Posterior view*
*c Dorsal view*

sometimes even the most powerful scanners cannot produce enough energy.

The use of X-CT scans is becoming more commonplace in palaeontology and with the advance in 3D printing technology, precise models can be created with relative ease. The biggest setbacks are the financial cost, and the time and skill needed to interpret the data. Although physical and digital models cannot be used to replace the original specimen, they can be of great use in understanding and demonstrating fossil material.

Evers and Wing (2020) give a cursory mention of the holotype of *Neovenator salerii* (MIWG : 6348) in a paper of comparative anatomy of German Jurassic theropod remains, where the positioning of the fossa (depression of the surface of the bone) on the medial surface of the fibulae was used to rule out a specimen as being an allosauroid.

Gale (2020) features IWCMS : 2019.3, the arm tip of the asteroid *Paragonaster wightensis*. Echinoderm remains in the Lower Greensand Group are mostly represented by sea urchins, but rarer brittle stars and starfish can also be found. In a review of the asteroids of the Crackers Member (part of the Lower Greensand) the specimen is used to aid the description of *P. wightensis* as it shows further detail of the upper surface of the arm.

Graham and Ewin (2020) present a novel method for the preparation of fossil ophiuroids. The skeletal remains of these brittle stars are small calcitic plates. Conventional methods of preparation which includes the use of an air abrasive to expose the surface of the fossil often damages the plates, abrading away the surface detail that is useful for taxonomic study.

The paper demonstrates use of air abrasion and work with small pins, followed by immersing the specimen in a bag of water and exposing it to an ultrasonic pen, providing superior results compared to conventional techniques. IWCMS : 1994.78 was used as a comparison specimen when prepared using conventional technique of an air abrasive to show the fine detail.

Hendrickx *et al*. give a cursory mention to MIWG:6348, the holotype of *Neovenator salerii*. In a review of the dental anatomy of *Sinraptor dongi*, a comparison is drawn with the teeth of Neovenator, so far the only dinosaur to show the autapomorphy of concave surfaces adjacent to the distal carinae on both the labial and lingual surfaces of multiple teeth.

Martill & Coram (2020) discuss new evidence for large bodied pterosaurs within the Wealden Group of the Isle of Wight and the impact that this has on pterosaur evolution. IWCMS : 2016.270, the distal portion of left metacarpal IV, is used to demonstrate a pterosaur with a wingspan slightly over 5.5 metres. Some Late Cretaceous pterosaur remains indicate wingspans of over 10 metres. This Barremian (Early Cretaceous, approximately 125mya) bone indicates large body forms had evolved 15 million years earlier than initially thought.

Penn *et al*. (2020) cites and figures several specimens in the collection of Dinosaur Isle in a description of the Wessex Formation present at Swanage Bay. The specimens are all from Swanage Bay and were accessioned for use in the paper as comparative material.

The Wessex Formation is interpreted as a moderately sized river system flowing from west to east. The exposed part of the Swanage Wessex Formation is typically older than what is exposed on the Island. The geography of where the unit formed shows subtly different palaeo-environments. With the Cornubian highlands to the west (roughly equivalent to Devon and Cornwall today), Swanage is closer to the source of the rivers. This is what causes the difference in geology and palaeontology between the Isle of Wight and Swanage.

Perkvsky and Makarkin (2020) briefly mention IWCMS : 2006.103 in a comparison of Insect fauna of the Bembridge Marls Member (Latest Eocene, Early Oligocene of the Isle of Wight) to that of the Baltic amber (Mid/Late Eocene of Russia).

In the Osteology and Taxonomy of the British Wealden Ankylosaurs, Raven *et al*. (2020) make note of IWCMS : 1996.153 (partial skeleton) and MIWG : 5390 (tooth) of *Polacanthus* sp. The paper includes in depth descriptions of the holotype specimens of *Hylaeosaurus artmatus and Polacanthus foxii*, and discusses the validity of other named Wealden ankylosaur genera and species. The Dinosaur Isle specimens are purely mentioned and the paper is a useful reference for Island dinosaur remains.

Sweetman and Goodyear (2020) describe IWCMS : 2018.47, a particularly large dropstone from the Wealden near Chilton Chine on the west coast of the Island. The specimen is a large metamorphic rock, approximately 20kg in weight, and demonstrating a moderate to high level of surface polish. Stones of this type are not part of the normal sequence of rocks exposed on the surface of the Island; all local geology is sedimentary. The paper demonstrates the stone is likely derived from the Cornubian Massif (an igneous and metamorphic province roughly correlating with Devon and Cornwall), and postulates its transportation to the Island in the roots of a tree caught in flooding 125 million years ago.

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# METEOROLOGICAL REPORT FOR SHANKLIN, ISLE OF WIGHT, 2020

***Clive Cooper***

**Abstract** *Shanklin Weather Station was established in January 1947 for the measurement of rainfall and January 1948 for temperature and sunshine recording. The Station is owned by the Isle of Wight Council and is maintained by the Met. Office. The station is situated at The Mead, a park area near Shanklin 'Old Village', towards the outskirts of the town and is 50 feet above sea level. The station is a simple one consisting of a 5" standard rain gauge and a Stevenson's Screen equipped with three thermometers. Readings and observations are taken once daily at 09.00GMT. The Campbell Stokes sunshine recorder is located on the roof of Shanklin Theatre, at a height of 180 feet above sea level. All averages refer to the Shanklin climate data set 1981-2010.*

JANUARY 2020 started mild and wet. The mean temperature for January was 7.3 C, being 1.5 °C above average. It was the 8th warmest for the past 37 years, the period for which the weather diaries are available. The warmest day was the 14th when 12.3 °C was recorded; the coldest day was the 24th when the temperature reached 6.7 °C. The coldest night was the 22nd with an overnight temperature of -2.0 °C,one of the four air frosts recorded in January.

The rainfall total was 114.8mm and was 126% of its average. Rain was recorded on 22 days; the average is 18. The highest amount in a 24-hour period, 21.7mm, was recorded on the 14th.

The sunshine for January totalled 60.7 hours, 89% of its average, which made it the 8th dullest in the last 37 years. The sunniest days were the 18th and 19th both with 7.8hrs. There were 13 days that were sunless.

Gales were recorded on the 13th and 14th.

FEBRUARY continued in the same vein, being wet and very mild. The mean temperature was 7.8 °C and it was the 3rd warmest in the 37-year series. The warmest day was the 9th with 12.2 °C. The coldest day was the 11th with 7.7 °C. The minimum temperature was recorded on the morning of the 6th when 0.4 °C was logged.

The rainfall total was 159.4mm and was 243% of the average. It was the 2nd wettest in the 37-year series. The wettest day was the 12th with 26.9mm of rain. Storm Dennis brought a further spell of rain with 21.5mm on the 15th and 15.8mm on the 16th. Rain was recorded on 24 days; the average is 13.

The sunshine totalled 96.3 hours and was 107% of the average. The sunniest day was the 26th with 9.2 hours of sunshine.

Gales were quite common during the month being recorded on the 9th (Storm Ciara), 11th, 13th, 15th, and 16th (Storm Dennis), 20th, 22nd, 23rd and the 24th.

Thunder was recorded on the 13th and 17th.

MARCH started cold, but with seasonal warming, ended warmer than normal with a mean temperature of 7.7 °C,compared to the average of 7.1 °C. The warmest days were the 10th and 17th both with 11.4 °C. The coldest day was the 5th with 6.7 °C. The coldest overnight temperature, recorded on the 6th, was -0.4 °C,the only air frost recorded in March.

The rainfall for March amounted to 67.5mm; this was 102% of the average. 66.8mm of the month's rainfall total was recorded in the first 14 days of the month. The wettest day was the 4th with 26.0mm, followed by the 5th with 16.8mm of rain recorded.

Sunshine for March totalled 128.4hrs and was 97% of the average. The sunniest days were the 23rd and the 24th both with 10.9hrs of sunshine. Readings ceased on the 25th March due to a National shut down.

Gales were recorded on the 10th.

APRIL Due to COVID19 restrictions, observations at Shanklin were suspended and data from Godshill is included here. The station is approximately 4 miles west of Shanklin and the readings for April show the temperature was above average, with a mean of 11.2 °C. The warmest day was the 11th when the temperature reached 23.4 °C; the lowest temperature of -1.8 °C. was recorded on the 1st. Rainfall amounted to 52.4mm, which is close to its average. The wettest day was the 17th with 21.4mm.

MAY Restrictions were relaxed so temperature and rainfall recordings recommenced 10th May. On the 10th the instruments were reset. The rainfall amount was 61.2mm this was attributed as follows: March nil; April 56.0mm; and the period 1st - 9th May 5.2mm.

The mean temperature for May was 13.3 °C and was 1.3 °C above the average. The warmest day in May was recorded on the 21st and was 23.9 °C. The temperature reached or exceeded 21.1 °C on 8 occasions. The coldest day was the 12th with a recorded maximum of 12.3 °C. The coldest overnight temperature, recorded on the morning of the 12th, was 0.9 °C.

There was no rain recorded from the 11th till the 31st at Shanklin; however, the neighbouring station at Godshill did record rain on the 1st 2nd 3rd 9th and 10th giving a rainfall total of 5.2mm.

Sunshine recordings remained suspended as Shanklin Theatre was closed due to COVID 19.

JUNE The mean temperature for June was 15.4 °C and was 0.7 °C above average; it was the 11th warmest in the 38-year series. The warmest day was the 25th with 25.7 °C recorded, one of seven occurrences when the temperature exceeded 21.1 °C. The coldest day was the 6th with 15.0 °C recorded. The coldest overnight temperature was recorded on the 6th when 7.1 C was recorded.

Rainfall totalled 34.7mm and was 75% of average. The wettest days were the 30th with 6.7mm and the 20th with 5.6mm. Rain was recorded on 15 days; the average is 10.

JULY The mean temperature for July was 16.5 °C and was 0.4 C below the average. It was the 17th coldest in the 38-year series. The warmest day was the 31st with a recorded maximum of 26.7 °C, one of nine days when the temperature exceeded 21.1 °C. The coldest day was the 25th with a recorded maximum of 17.3 °C. The coldest overnight temperature, 8.4 °C was recorded on the morning of the 12th.

July was another dry month, with just 34.4mm of rain which was 73% of its average rainfall. The wettest day was the 25th with 12.3mm of rain. Rain was recorded on 13 days; the average is 9. On the 4th the weather was dull, with poor visibility and a gale.

AUGUST The month started dry, with temperatures about average, then from the 7th very hot air arrived from the continent. Westerlies returned later in the month with a significant drop in temperature. The mean temperature was 18.6 °C, 1.6 °C above average. The hottest day was the 9th with a recorded temperature of 32.2 °C. This equals the highest temperature recorded, on the 4th August 1990 at Shanklin. The remarkably hot spell lasted 7 days the maximum temperatures were 26.4 °C (7th), 29.8 (8th), 32.2 (9th), 26.8 (10th), 31.1 °C (11th), 30.0 °C (12th) and 25.3 °C(13th). There were 14 days when the temperature reached or exceeded 21.1 °C. In comparison during the period 21st - 31st, the average maximum temperature was 19.0 °C.

Rainfall during the month occurred mainly during the second half of the month. The 1st till the 14th had 3 days with rain and a total of 2.6mm whereas the 15th till the 31st had 11 days and 112.7mm of rain. The wettest day was the 16th with 26.6mm, with further heavy rain on the 24th 17.9mm, the 18th and the 23rd both with 16.4mm. The total for the month was 115.3mm, 211% of its average and the 6th wettest in 38 years.

SEPTEMBER The temperature for September was warmer than average, at 15.7 C, which was 0.6 °C above average. The warmest day was the 15th with 26.3 C recorded, one of eight days when the maximum temperature reached or exceeded 21.1 °C. The coldest day was the 26th when the temperature was 14.2 °C. The lowest temperature overnight was recorded on the morning of the 28th, when 5.9 °C was recorded.

Rainfall was again low, with only 26.8mm recorded which was 38% of its average. This made September 2020 the 4th driest September in the last 38 years. The wettest days were 24th with 11.9mm and the 30th with 7.4mm. The period 5th till 19th inclusive was dry, with no rain recorded.

OCTOBER The temperature for October was equal to its average of 12.3 °C. The warmest day was the 8th with 17.8 °C; the coldest day was the 13th with 12.4 °C; and the coldest overnight temperature was recorded on the 16th when the temperature fell to 3.7 °C.

The rainfall for October was well above average at 223.5mm, 194% of its mean value. The month started very wet, with 25.4mm of rain on the 1st, 33.5mm on the 2nd, 20.8mm on the 3rd and 14.0mm of rain on the 4th; 93.7mm of rain in four days, against the monthly average of 115.0mm. The weather turned drier from the 8th till the 18th before the rains returned. A further wet spell from the 24th till the 31st added 81.5mm to the total.

NOVEMBER started very mild with the maximum temperature on the 1st reaching 16.6 °C, equal fourth highest November temperature, the highest being 17.1 °C recorded in 2007, also on the 1st of the month. The coldest overnight temperature was recorded on the morning of the 5th when 1.8 C was recorded. The coldest day was the 26th when 8.7 °C was recorded. The mean temperature for the month was 10.5 °C. It was the 5th warmest since my records started in 1983. The temperature exceeded 10 °C on 28 days and no air frosts were recorded during the month.

There was 85.8mm of rain during the month which equated to 79% of the Climate Average. The wettest day was the 14th, with 37.0mm of rain.

Gales were recorded on the 1st.

DECEMBER The start of the month was cold, but a recovery in temperature from the 13th till the 23rd ensured that December was 0.5 °C above the climate average with a mean temperature of 6.9 °C. The highest temperature was recorded on the 21st and the 23rd, when 13.0 °C was recorded. The lowest overnight temperature was recorded on the 8th when the temperature fell to - 0.9 °C. It was the first air frost of the season, one of four recorded during the month.

Rainfall amounted to 179.6mm and was 178% of the climate average. The wettest day was the 26th with 30.2mm; other high daily totals were recorded on the 20th with 20.2mm and the 3rd with 21.4mm.

Sleet was recorded on the 29th.

**Author:** Clive Cooper, Meteorological Observer.
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Isle of Wight, PO38 3HR

| Month | Average Temperature °C | Mean Maximum Temperature °C | Mean Minimum Temperature °C | Rainfall mm | Sun hours |
|---|---|---|---|---|---|
| January | 7.3 | 9.7 | 5.0 | 114.8 | 60.7 |
| February | 7.8 | 10.1 | 5.5 | 159.4 | 96.3 |
| March | 7.7 | 10.2 | 5.1 | 67.5 | 128.4 |
| April | Not Recorded | Not Recorded | Not Recorded | 56.0 | Not Recorded |
| May | 13.3 | 18.1 | 8.4 | 5.2 | Not Recorded |
| June | 15.4 | 19.0 | 11.8 | 34.7 | Not Recorded |
| July | 16.5 | 20.2 | 12.8 | 34.4 | Not Recorded |
| August | 18.6 | 22.1 | 15.1 | 115.3 | Not Recorded |
| September | 15.7 | 19.6 | 11.7 | 26.8 | Not Recorded |
| October | 12.3 | 15.1 | 9.4 | 223.5 | Not Recorded |
| November | 10.5 | 12.9 | 8.1 | 85.8 | Not Recorded |
| December | 6.9 | 9.2 | 4.7 | 179.6 | Not Recorded |
| YEARLY FIGURE mean of 11 months* | 11.99* | 15.11* | 8.87* | 1103.0 | |
| Climate Average 1981 - 2010 | 10.9 | 13.9 | 7.9 | 870.8 | 1923 |

**Table 1:** Monthly records for weather at Shanklin.

**Fig. 1:** 'Fair weather' cumulus clouds seen over Newtown National Reserve in July 2020.
Photograph: Mike Cotterill

# ARTICLES ABOUT THE ISLE OF WIGHT THAT HAVE RECENTLY APPEARED IN OTHER PUBLICATIONS

**Treatment of landfill leachate at a remote closed landfill site on the Isle of Wight**

Robinson, T., 2020 *Detritus* **10,** 182-199.

**Abstract:** Safe treatment and disposal of leachates is an important issue at many old landfill sites, where the ingress of rainfall or groundwater is a significant issue requiring consideration. Such leachates may typically be relatively weak, but flows are often characterised by large seasonal variations, in response to winter rainfall. This paper compiles and presents long-term data from a case study on the Isle of Wight. This paper highlights how a successful treatability trial using representative leachates can help predict the effectiveness of a large-scale treatment plant when treating landfill leachates biologically. Bleak Down leachate treatment plant effectively removes all concentrations of ammoniacal-N within the weak leachate generated by the site, ensuring that the discharge consent set by the Environment Agency is achieved consistently. The site is completely unmanned and remote, where monitoring technicians are only required to attend site twice per month in order to assess the success of the biological process. Through an online SCADA control system, operation of the treatment plant can be monitored and controlled remotely, trends in results can be observed, and daily data and treatment records downloaded. This treatment plant is an example of how leachate from old closed landfills can be effectively managed, with very low costs of operation, maintenance and site attendance. This paper presents comprehensive analytical and volumetric treatment data from the Bleak Down LTP, before presenting practical steps that would enable this success to be replicated at similar remote closed landfill sites.

**A Well-Married Landscape: Networks of Association and 6th-Century Communities on the Isle of Wight. In The Land of the English Kin. Studies in Wessex and Anglo-Saxon England in Honour of Professor Barbara Yorke**

Harrington, S., 2020 *Brill's Series on the Early Middle Ages* **26,** 95-111.

**Abstract:** That women are by and large 'hidden from history' is an obvious statement, a consequence of texts being produced for purposes from which, it is inferred, they were uninvolved in or excluded from or at least did not have their contribution acknowledged. To quote Gillian Clarke "We are, as usual, trying to interrogate the writings and artefacts of men for information it never occurred to them to give." Accordingly, to find women in the past from historical sources, one has to read beyond the small volume of evidence to establish, beyond a few named individuals, the existence of the female population. Whilst it would be tedious to reiterate and bewail the masculinist content of the king lists and other documents from that period, Barbara Yorke's work on the early Anglo-Saxon kingdoms raises one's hopes that meaningful lives of contemporary women can be illuminated. By aligning feminist perspectives on archaeology with approaches from social geography in conceptualising space, place and gender, and considering elements of the archaeological record as a form of social network, different perceptions of the cultural dynamics of the mid-first millennium AD might be foregrounded. An appraisal of source material is required, both 7th-century historical and earlier archaeological, in order to tease out aspects of attitudes to and the position of women in the sixth century in Britain.

This paper was prompted by two factors: firstly, Barbara Yorke's presentation on the mid-6th-century female from Chessell Down grave 45 at the ucl Institute of Archaeology conference, *Women's Work: Archaeology and the Invisible Sex* (2000). This encouraged me to reflect that by acknowledging my wariness regarding historical sources, a reappraisal of the intersections with archaeological research would be fruitful. Secondly, her comments on the role of women in the power struggles and strategies in the formation of the Kentish kingdom, formed a glimpsed narrative of gender issues in the 7th century—with outcomes that could be investigated via the archaeology of the 6th and which will be expanded upon in this paper.

**Multigene Phylogeny, Morphological Observation and Re-examination of the Literature Lead to the Description of the Phaeosacciophyceae Classis Nova and Four New Species of the Heterokontophyta SI Clade**

Graf, L., Herbert, R., and others 2020 *Protist*, **171** 1-25.

Article reference :171(6):125781.doi: 10.1016/j.protis.2020.125781

The heterokont algae (photosynthetic stramenopiles) are an exceptionally diverse group that includes naked amoeboid organisms, flagellate and coccoid algae, silica-walled diatoms, and giant brown seaweeds. Recent phylogenetic analyses have identified three major clades, termed the SI, SII and SIII clades. The paper focusses on clade SI of photosyn-thetic heterokonts which includes *Nematochrysis sessilis* var. vectensis, collected on 27 August 2015 from East Harbour Lagoon, Bembridge (type locality), Isle of Wight, by Louis Graf and Roger Herbert. This is not a newly defined species but its place in the clade is described.

**Shelving the Coast With Vertipools: Retrofitting Artificial Rock Pools on Coastal Structures as Mitigation for Coastal Squeeze**

Hall, A. E., Herbert, R. J. H., Britton, J. R., Boyd, I. M. & George, N. C. 2019 *Frontiers in Marine Science* **6** 456, 1-11

**Abstract:** Coastal squeeze caused by sea level rise threatens the size, type, and quality of intertidal habitats. Along coast-lines protected by hard defences, there is a risk that natural rocky shore habitats will be lost, with the remaining assemblages, characteristic of hard substrata, confined to sea walls and breakwaters. These assemblages are likely to be less diverse and different to those found on natural shores, as these structures lack features that provide moist refugia required by many organisms at low tide, such as pools and crevices.

Engineering solutions can help mitigate the impact of sea level rise by creating habitats that retain water on existing structures. However, as experimental trials are strongly affected by local conditions and motivations, the development of new techniques and solutions are important to meet the needs of local communities and developers. Following a small-scale community project, a feasibility study retrofitted five concrete-cast artificial rock pools ("Vertipools") on a vertical seawall on the south coast of England. After 5 years, the artificial pools increased the species richness of the sea wall and attracted mobile fauna previously absent, including fish and crabs. The Vertipools had assemblages which supported several functional groups including predators and grazers. Although disturbance of algal assemblages on the seawall from the retrofitting process was still evident after 3 years, succession to full canopy cover was underway. Collaboration between policy makers, ecologists, children and artists produced an ecologically sensitive design that delivered substantial benefits for biodiversity, which can be adapted and scaled-up to both mitigate habitat loss and enhance coastal recreational amenity.

## FLOWERING PLANTS AND FERNS, ILLUSTRATIONS CONTINUED

**Fig. 15:** Chinese Mallow, *Malva verticillata*, Puckpool Park, photo Mark Spencer.

**Fig. 16:** Corsican Mint, *Mentha requienii*, Fairlee Cemetery, photo Dave Trevan.

**Fig. 17:** Yellow Star-thistle, *Centaurea solstitialis*, Brook.

**Fig. 18:** Italian Bluebell, *Hyacinthoides italica*, Kings Manor Farm, Freshwater, photo Jess Aldred.

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# WIGHT STUDIES: NOTES FOR THE GUIDANCE OF AUTHORS

Wight Studies is published annually in August and papers on all topics within the range of interest of the Isle of Wight Natural History and Archaeological Society (IWNHAS) are welcomed. The managing editor Paul Bingham (iowpaulb@aol.com) welcomes prior discussion with potential authors, especially if longer papers are proposed.

Various types of articles are published

Original papers report on original research related to the objectives of IWNHAS. These generally do not exceed 8000 words.

Review papers, on topics related to the objectives of IWNHAS, may either summarize areas of importance, provide an up-to-date account of the present status of active research areas, or give a perspective for future research.

Short notes and annual reports are brief papers that contain significant observations, of the order of 2000 words in length.

Comments and replies: Comments relate to articles published in Wight Studies in the previous year. Their intention has either to be a substantial critique of the original article or the clarification of a major misunderstanding that could have been caused by the original article. The authors of the articles commented on have the right to reply. Comment and reply will be published together.

Submission of a manuscript implies that the work described has not been published before and that it is not under consideration for publication anywhere else, unless exceptional circumstances are agreed with the editor; its publication has been approved by all co-authors (if any), as well as (if applicable) by the responsible authorities at the institute where the work has been carried out; and it will become the copyright of IWNHAS.

Papers should be submitted electronically to the managing editor, using the guidelines below.

**Manuscript Submission**
To meet the publication and distribution dates in mid-August, the deadline for the submission of original papers is 28th February. Short notes and annual reports should be submitted by 30th April.

On receipt, submitted material will be forwarded to the appropriate member of the editorial board for review and comment. If any part is thought to require reworking, there will be discussion with the author(s) before the paper is accepted.

Once accepted, the paper it will go through the copy-editing process; checking for clarity; provisional formatting; and proof-reading. Once this has been done, the material will be returned to the corresponding author via email; this must be returned with any further minor corrections and/or revisions that the author deems necessary within the time-frame specified by the editor.

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The title page should include:

The name(s) of the author(s) and indication of who is the corresponding author

A concise and informative title

An abbreviated title to serve as a running header

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**Acknowledgments**
Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be given in full.

**Abstract**
Please provide an informative summary of the paper, in not more than 200 words. A list of up to 5 keywords is also desirable. If a report is commercially funded, contact the managing editor for guidelines.

**Text Formatting guidelines**
Manuscripts should be submitted in Word (or in a Word-editable file) using a plain font (e.g. Times Roman 10, Calibri 11) for text; italics may be used for emphasis. Indentation, paragraph spacing, columns and other formatting will be determined at the designer's layout stage. The layout and the font used in the final publication will conform to the house style of Wight Studies.

The automatic page numbering function should be used to number the pages, but not field functions as these may cause problems in the production process. Tab stops should be used for indents, rather than the space bar.

Files should be saved in .docx format (Word 2007 or higher), .doc format (for older versions) or other format which can be opened in Word.

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Numbers 1-9 should be given in words; 10 and over as numerals.

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**Reference List** This list should only include works that are cited in the text. Personal communications should only be mentioned in the text. Reference list entries should be alphabetical by the last names of the first author of each work and conform to the following style.

**Book** Pope, C., Snow, L. & Allen, D. 2003. *The Isle of Wight Flora.* Wimborne: Dovecote Press.

**Chapter in a book or monograph** Allen, D. 2003. A history of Botanical Recording in the Isle of Wight in Pope, C., Snow, L. & Allen, D. 2003 *The Isle of Wight Flora.* Wimborne: Dovecote Press, pp36-48.

**Editors and Editions** Douglas, D.C. & Greenway, G.W. (eds.) 1981. *English Historical Documents* vol. 2. 2nd edition. London: Eyre Methuen.

**Journal article** Margham, J. 2011. Place-names in an Island Landscape: Hills and Valleys Part 1, *Proc. Isle of Wight Nat. Hist. Archaeol. Soc* **25**:16-51.

Cite the actual publication date of an individual journal volume where there is a discrepancy between the 'official' date and the actual date e.g. vol 21 of the Proceedings: the official date was 2005 but the volume was actually published in 2006; the latter date should be cited.

**Online document** Elith, J *et al* 2011. A statistical explanation of Max Ent for ecologists. *Diversity and Distributions* 17: 43-57. [online] http://onlinelibrary.wiley.com/doi/10.1111/j1472-4642.2010.00725.x/pdf.

**Dissertation** Scaife, R.G., 1980. *Late-Devensian and Flandrian palaeoecological studies in the Isle of Wight* University of London, Kings College. PhD thesis.

**Series** Edwards, H. 1988. The Charters of the Early West Saxon Kingdom BAR British Series 198. Oxford.

**Unpublished source** Chatters, C. 1984. *The downs and heaths of the Isle of Wight.* Isle of Wight Countryside Heritage Study: Unpublished document.

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