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ISLE OF WIGHT
NATURAL HISTORY AND ARCHAEOLOGICAL SOCIETY

Address: Unit 7c, Prospect Business Centre, Cowes, Isle of Wight, PO31 7AD
Tel: 01983 282596 Email: iwnhas@btconnect.com Website: www.iwnhas.org

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Treasurer	Nigel Locke
General Secretary	Dr Colin Pope 14 High Park Road Ryde, IW PO33 1BP
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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.

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Cover photographs

Top left:
Bill Shepard at the first event of the Society's centenary celebrations November 2019.
Photo: Keith Marston

Top right:
Apple blossom in a hedgerow at Newtown.
Photo: Keith Marston

Bottom left:
Rose bedeguar gall, also known as Robin's pincushion, produced by the gall wasp *Diplolepsis rosae.*
Photo: Mike Cotterill

Bottom right:
Barn owl *(Tyto alba)*, iWatchWildlife Species of the Year 2025
Photo: © Danny Vokins

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Managing Editor	Dr Paul Bingham iowpaulb@aol.com
Copy Editor	Anne Marston
Chairman Editorial Board	Professor Anthony Roberts

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Archaeology	Dr David Tomalin
Flora	Dr Colin Pope
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Notes regarding submissions are printed at the end of this volume.

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Editorial

Once more, we are pleased to be able to deliver an issue of *Wight Studies* which reflects the range of our members' interests and demonstrates how the Society continues to fulfil its objectives.

A reliable water supply is of paramount importance in the founding of human settlements; there are many place-names with a 'watery' connection on the Island – Brook, Freshwater, and Whitwell - to name but a few. In the 21st century, we take for granted a reliable water supply and appropriate treatment of wastewater. When these process do not happen, considerable disruption occurs. There are currently significant concerns over the discharge of untreated effluent into our seas and rivers. There are continued questions about the adequacy of water supplies in the light of changes in rainfall patterns resulting from a changing climate, and the pressures generated by new housing and commercial development. The paper dealing with the history of the development of Ryde's water supply and sewerage system is a reminder that previous generations have wrestled with similar problems and there are lessons to be learned from their actions and experiences.

We continue to delve into the Island's prehistory history and history with a variety of articles. Studies of the fossil remains of animals present in the Cretaceous and Tertiary rocks are ongoing, particularly at Dinosaur Isle Museum. The archaeology group are active in using cutting-edge technology to uncover remains of ancient settlements. The paper relating to the Domesday book gives further insights into how land was settled and managed at the time of the Norman conquest. The history the medieval quarrymen and stonemasons who worked geological deposits on the Dorset coast to produce ecclesiastical monuments poses interesting questions about connections between settlements.

The annual reports give summaries of recent observations in natural history. Papers discussing the biodiversity of our cliffs and limpet distribution around our shores underline that change is continually occurring and highlighting the need for long-term studies to build up a detailed picture of these changes.

One of our cover photos shows a barn owl *(Tyto alba),* Species of the Year for our *iWatchWildlife* recording project. It is one of the Isle of Wight National Landscape's eight flagship species being targeted for nature recovery. These wonderful birds, linked with our pastoral heritage have declined drastically in the UK during the past 100 years. This is thought to be due to a combination of factors such as habitat loss, barn conversions, changes in farming techniques and use of harmful pesticides. Here on the Island, they can still be seen but not in the numbers there once were. Barn owls are most active at dawn and dusk when they search for prey in open country, farmland and woodland edges. Please report sightings by email to iwatchwildlife@gmail.com, and assist in building up a picture of the distribution and activity of this beautiful bird.

Paul Bingham and Anne Marston
Editors of the Proceedings

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HISTORY OF THE WATER SUPPLY AND SEWERAGE OF RYDE, ISLE OF WIGHT TO 1868

Paul Bingham and Fred Caws

Abstract *The town of Ryde on the Isle of Wight (IOW) grew progressively from the 1780s but, like many United Kingdom urban settlements, was dogged by an inadequate water supply and poor sewerage. These defects persisted in Ryde until recent times. This article covers the period from William Player, Lord of the Manor, first selling building leases, until the dissolution of the Ryde Town Commissioners, following Ryde being granted Borough status. By 1868, Ryde Town Improvement Commissioners had obtained a water supply from 3 to nearly 4 miles south of the town, 'retrofitted' sewers, and the western and eastern outfalls had been extended to low tide mark. All this activity entailed four local Acts of Parliament, six government-inspector chaired inquiries and many meetings of the Improvement Commissioners. Minutes of the Ryde Town Commissioners have been preserved in the Records Office for the Isle of Wight, but many detailed supporting papers were not kept. However, key to research, copies of the Isle of Wight Observer (IWO, a Ryde-based newspaper), archived by the national newspaper library, are electronically searchable. Printed reports of some IOW government inquiries are also available.*

Keywords:
Ryde, local Acts of Parliament, Town Improvement Commissioners, water supply, sewerage, public health

Introduction

Ryde is a seaside town on the north-east coast of the IOW that blossomed largely because of its location, opposite Portsmouth. The construction of Ryde Pier (opened 1814) acted as a gateway to and from the IOW. The history of the water supply and sewerage of Ryde touches on geographical and geological constraints and opportunities; a commercial company; governance that was put in place to 'improve' the town; wealthy residents of Ryde and those generally considered the least, its poor.

Ashey and Ryde Manors

The ancient manorial (land ownership) rights for Ashey and Ryde were key to the development of the town of Ryde. The Manors became the property of the Player family and their descendants, the Brigstockes and Linds.

Ashey Manor, granted before 1228 to the Abbey of Wherwell, near Andover, was located between Binstead Stream and Monktonmead Brook, the sea and downs. Landing rights at Ryde formed part of the income of the Manor. After the dissolution of the monasteries, part of the Manor of Ashey was separated to form the Manor of Ryde.

In 1705, Henry Player (d.1711) of Alverstoke in Hampshire, established the IOW branch of his family, when he purchased the Manor of Ryde. His grandson William Player (1712-1792), initiated the urbanisation of Ryde and, after the death of his son George Player (1761-1843), the estate was divided in half and passed respectively to his grandson Dr James Player Lind, and via his granddaughter, to her husband, Captain Thomas Robert Brigstocke RN (see Table 1).

In 1789, the Manor of Ashey was sold by Lord Mount Edgcumbe to the Bettesworths, who are memorialised by the name of a road in Ryde. They later sold it to George Player, thereby reuniting the Manors of Ashey and Ryde. There had been friction between the Bettesworths and Players as to shore rights. In 1811, the rights were adjudged by a jury at Winchester Assizes to belong to Mrs (Ann) Bettesworth.

Parish boundaries

In addition to the manorial boundaries that defined land ownership rights, parish boundaries were of great importance as these determined to whom inhabitants had to pay tithes and the amount of their Poor Law contribution. Originally, the developing settlement of Ryde was in the medieval parish of Newchurch that stretched from the north to south coast of the IOW and also included Ventnor. Later in 1866, the parish of Newchurch was divided (see Table 1).

1.Commencement of the urbanisation of Ryde, through to a petition for a Public Health Act (PHA 1848) Inquiry

The urbanisation of Ryde was initiated in the late 19th century by the uniting of the village of Upper Ryde (up to 150 feet above sea level) with Lower Ryde which fronted the sea. William Player laid out Union Street that linked the two villages and began selling annual leases for building plots. Unfortunately, the leases did not specify sufficient conditions or restrictions on the construction of wells, privies, cesspits, and mains drainage that would have ensured safe public health.

The first phase of the development of Ryde was firmly in the hands of its wealthy landowners and aristocratic residents. Apart from laying out roads and neighbourhoods, a first big innovation was Ryde Pier Company (RPC) that also had an interest in supplying water; not to households but, more lucratively, to passing ships. The establishment of Ryde Improvement Commissioners in 1829 was a next big initiative, although this did little to improve the water supply and sewerage of Ryde. In 1851, less wealthy ratepayers of Ryde (those not eligible to be Improvement Commissioners) petitioned for a PHA 1848 Inquiry.

Shallow wells and the necessity of a piped water supply from the downs

The Georgian and early Victorian residents of Ryde obtained their drinking water largely from shallow

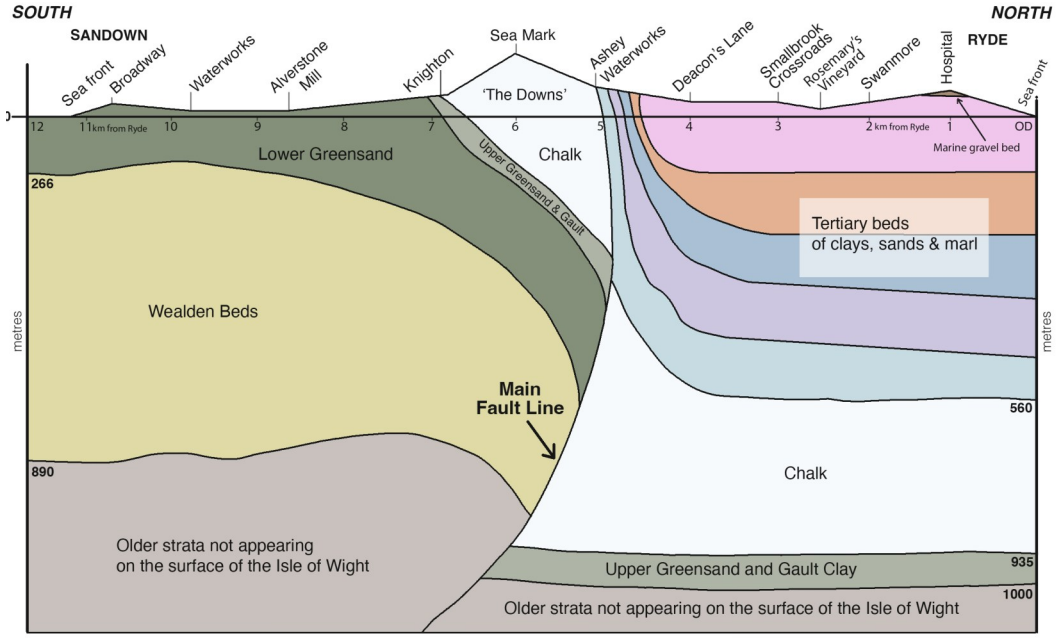

Fig. 1: Beneath Ryde, the chalk is more than 500 metres below Ordnance Datum. South of the main fault line, chalk has been folded up forming the central and south chalk downs. Between these two features, the chalk has been eroded away to expose Lower Greensand. North of the main fault, the Wealden Beds and Lower Greensand are absent.

wells (18 to 25 feet deep: see first Ranger report p68). Most wells were private, but some were communal/public. By that time, the lower Monktonmead Brook is likely to have been contaminated and unusable as a source of water. There was some utilisation in Ryde of roof-captured rainwater and the employment of workers in summer to cart water into the town. Of note, in the late 1840s, when the Isle of Wight Infirmary was constructed in the upper part of Ryde, anticipating that its well might not be adequate, two 700 gallon tanks were incorporated into the roof to store rainwater. In parts of Ryde where superficial gravels overlie impermeable clays, it was possible to construct wells. Rainfall percolating through the gravel collects in 'aquifers' where water could be accessed. Unfortunately, this supply was limited and, as the town grew, the water table became increasingly polluted from cesspits and drainage ditches. Eventually a sufficient and clean water supply for Ryde depended on piping water from the central Chalk Down/Greensand aquifer that lies to the south of Ryde (see Fig. 1 above). It should, however, be noted that the piped water supply of the west of Ryde cannot generally connect with the east of Ryde and vice versa, because the valley of the Monktonmead Brook imposes a gravitational barrier. This barrier also constrained sewerage arrangements for Ryde, with the west of Ryde draining via the western outfall, and those of eastern Ryde and east of Monktonmead Brook, draining via the eastern outfall (see Fig. 4, p17).

Cesspits and drains

Initially, sewage flowed into cesspits and ditches that would have been cleaned infrequently. In time, as the population grew and flushing toilets were installed by wealthier residents, cesspits for sewage became unsustainable. Some public sewers were constructed but they only reached high water mark. Unfortunately, at low tide this resulted in a stinking nuisance, but it was years before outfalls were extended to low water mark. At no point, while Ryde had control of its water supply and sewerage, did it treat sewage to minimise the impact on the environment.

Monktonmead Brook, its catchment, the Downs and catchment of the Eastern Yar

Monktonmead Brook is a small river that flows from springs located at the foot of the chalk down (Ashey Down), three miles south of Ryde. As it approaches the sea, the brook originally entered a marsh that marked the eastern boundary of William Player's Manor, and also the boundary between Newchurch, the parish in which Ryde developed and the neighbouring parish of St Helens. However, as Ryde developed, the marsh was drained and building extended east of this boundary as the 'unincorporated' neighbourhoods of St John's, Oakfield and the Strand.

As can be seen from Fig. 3 (p16), the rainwater catchment for Monktonmead Brook is located north of the central chalk downs, between that for Blackbridge Brook and the lower Eastern Yar. James Easton, who later recommended Ashey as a water source for Ryde (see Table 3, p18), failed to recognise that the catchment for Monktonmead Brook, and the spring at Ashey, is very much smaller than that providing water to Carisbrooke which he held up as an exemplar. Neither did he recognise the extensive catchment of the Eastern Yar. When put to the test by the construction of a waterworks, in summer Ashey proved inadequate for the needs of Ryde.

The catchment for the Eastern Yar commences in the far south of the Island at St Catherine's Down. The upper Eastern Yar eventually flows through a 'breach' in the downs to reach Bembridge Harbour and the sea. A number of mills are located on the Eastern Yar, including Knighton and Alverstone mills. Water from Knighton mill pond flows on to Alverstone mill pond and eventually to Bembridge Harbour.

The Ryde Pier Company (RPC)

During the days of sail, many ocean-going boats moored off Ryde and required supplies of fresh water, especially before setting off on a long voyage. Apparently, with the permission of the Lord of the Manor, various entrepreneurs in Ryde capitalised on this by obtaining water from wells established in the town. They presumably filled barrels and rowed these out to anchored ships.

RPC was established in 1812 and shareholders obtained a local Act of Parliament to build a pier across Ryde sands. The sands extend more than 600m from the high water mark and present an obstacle, apart from at high tide, to the landing of passengers from boats.

RPC shareholders noted the water supply business as a potential lucrative side-line and included within their Act the objective of 'supplying fresh water to ships and vessels'.

Maycock and Silsbury (2005), who researched RPC minutes in the National Archives noted:

> At its first Board meeting, RPC decided to buy out the existing waterwork business of John Cooper, James Denham and William Baker, but this took until the late 1820s to complete.
>
> During the 1830s, RPC constructed waterworks in the upper town (see Table 2), but these were not a long-term success and the ground was subsequently reinstated.

William Ranger (see Table 3) noted in the report of his first Inquiry:

> In 1841, RPC formed a reservoir towards the top of the town (p12). Several of the public wells had been *'stopped up or the supply almost entirely abstracted by the extended RPC works'* (p19).
>
> In 1844, RPC leased its waterworks for supplying ships to Jonathan Dashwood (see Table 3). He was permitted to supply the water that remained to houses in Ryde. At some point, as related to the Ranger Inquiry (p 19), the quantity and quality of water to supply ships diminished and vessels began diverting to Portsmouth for supplies, even though this entailed travelling extra distance. It was noted that this had a knock-on to other businesses in Ryde that lost the trade of visiting seafarers.

At its outset, RPC had to overcome financial difficulties and raise funds to invest successively in extensions of the pier, a pier head and later a pier tramway. Nevertheless, the company became profitable and for many years dominated the economic life of Ryde.

Ryde initiates local government – Ryde's first two local Improvement Acts

At the end of the 18th and into the first part of the 19th century, there was rapid development of towns in Britain, as was the case on the IOW. Although some IOW towns developed within ancient corporations, e.g. Brading, these had little or no 'local government capacity' to respond to urbanisation. In particular, they were unable to impose rates for investment in necessary community projects. To achieve these objectives, towns had to draft (and pay for) local Acts of Parliament that set out what 'improvement' could and could not be undertaken, all within strict geographical boundaries. Local Acts stipulated who could make decisions, generally ratepayers who 'qualified' on the basis of wealth, rather than being elected. On the IOW, local Acts were initiated by:

1786 Newport - Paving, Repairing, Cleaning, Lighting and Watching
1816 Cowes - Improvement and Market
1829 Ryde - Improvement and Market
1844 Ventnor - Improvement and Market

First Ryde Improvement Act (1829)

Further research might or might not reveal precisely who initiated the Ryde Improvement and Market Act 1829, but its cost (£870) became a charge against all ratepayers, rich and poor. Unfortunately, statistical summaries for the 1831 and 1841 census do not give population counts for the town of Ryde. The 1829 Act qualified any ratepayer who had real or personal property of £1000 or more to act as a Town Improvement Commissioner (about 60 or 70 qualified), but business (meetings of the Commissioners) was generally transacted by about 12 persons. Later in 1851, Ryde ratepayers consisted of 1423 households (see Table 4, p19 of this paper).

Ryde Improvement and Market Act (1829) comprises 119 clauses and, like other local Acts, mainly relates to pavements in the town, regulating nuisance trades, lighting, security and the establishment of a market.

From the outset, the main focus of Ryde Improvement Commissioners was the provision of a town hall and market. This consumed almost all of the money the Commissioners could borrow based on the security of the rates, and then further borrowing based on the security of what they had built. Very little money was left for public health improvement. A piped public water supply was not contemplated by the Commissioners, there being a number of public wells in Ryde. Sewers were debated, but at this time, construction was limited.

None of the clauses of the 1829 Ryde Act relate specifically to sewerage or have the margin heading 'sewers'. Present and future gutters, drains, sewers and watercourses had to be kept in repair (clause XV) and there is a clause relating to the pollution of rivers (clause XLIV). Water pipes are mentioned but in connection with the potential for water to be contaminated by gas (clause XLII – the Ryde Gas Company was not established until 1838).

Second Ryde Improvement Act (1847)

In 1847, in order to create more 'financial headroom', Ryde Improvement Commissioners obtained a second local Act. This Act had only 22 clauses, none relating to water supply or sewerage, but generally about increasing the amount that the Improvement Commissioners could borrow and therefore spend. The Act was in operation for seven years, until 1854, alongside unamended parts of the first Ryde Act. There was some increase in public health spending, although the Improvement Commissioners remained restricted in what they could do, even had they wanted to.

2.'Ranger' Inquiries, rejection by Ryde of provisions of PHA 1848, a third Ryde local Improvement Act and establishment of Ashey waterworks

In 1848, Parliament passed a Public Health Act (PHA 1848), partly because it was evident that the country was going to be swept by a second pandemic of cholera (the first occurred in 1832), but also as an alternative means for a District or Town to gain public health-orientated local government without the expense of obtaining their own local Act of Parliament. PHA 1848 established a London-based General Board of Health (GBH) (for five years only) and set out draft clauses that local (i.e. District or Town) Boards of Health could adopt. However, the Act could be imposed by the GBH if the mortality of a locality exceeded an average of 23 per 1000 over seven years, or if, after an Inquiry, local residents requested a local Board.

On the IOW, inquiries were petitioned for by residents of Whippingham (1850) West Cowes (1850), and in 1851, Ryde. All three of the IOW inquiries were chaired by William Ranger (1800-1863), Superintending Inspector, appointed by the GBH.

First Ryde Ranger Inquiry (1851)

William Ranger's Inquiry in Ryde was conducted over 5 days from 10th to 14th December 1851. The Inquiry had been petitioned for by 144 ratepayers of Ryde, and *not* the Town Improvement Commissioners. The intention of the petitioners was reportedly the adoption of PHA 1848 provisions, and establishment of an elected local Board of Health to replace the Improvement Commissioners. Driven by the GHB, adoption of PHA 1848 would undoubtably have resulted in expenditure on a piped water supply and improved sewerage, although how this would have been achieved, including from where water would have been sourced for Ryde, can only be speculation. Charles Colenutt and others, including George Butler, the editor of IWO, favoured abstraction at Alverstone Millpond as the best water source for Ryde and this opinion was later endorsed by Henry Austin, GBH's engineer. However, to advocate Alverstone, it was necessary to argue that the benefits of sourcing a 'guaranteed' large volume of water outweighed additional pumping costs (say, compared to sourcing water at Ashey) and the expense of treating water from Alverstone, it being 'river' rather than 'spring'. Apart from George Butler, there was no persistent or persuasive voice for Alverstone as Ryde's optimum source.

As an Inquiry Chairman, William Ranger would not have been impartial and the text of his 96 page first Ryde report is inevitably influenced by his allegiance to the GBH. Nevertheless, there appears to have been consensus in Ryde that Ranger's grim depiction of poor local public health was accurate, even though there was no agreement over his recommended solutions. Written and verbal evidence was given to the Inquiry by the 'better-off', including wealthy homeowners and those renting large establishments. They made clear that the lack of a safe, clean water supply, and poor sewerage, also affected the privileged. How poor public heath was affecting and killing the poor was detailed by doctors and the clergy. In particular, Benjamin Barrow, the lead surgeon in Ryde, gave detailed descriptions of the circumstances in which the poor were living. The following is taken from the evidence given by Mr Barrow:

'In some cases the house-well and the privy were not more than a foot apart, the supply, it must be remembered, being drawn from the surface, so that much of the impurity of the soil-pit forced its way into the water which the people drank, cooked, and washed in for six months in the year. He had discovered the infiltration of the foetid liquid from being called upon to examine the water in a well of this description; the investigation led to the detection of a considerable quantity of animal matter, and he found that the amount of impurity increased or diminished according to the yield of the well'.

Barrow was one of the original 144 to petition for the Ranger Inquiry. Subsequently he became an Improvement Commissioner and an opponent of George Butler and the IWO (see Table 3).

At the Inquiry, both Dr Lind and Captain Brigstocke, the Freeholders and Lords of the Soil said they favoured the welfare of the town. Captain Brigstocke, RN., JP. stated:

'that he was one of the lords of the soil, and that he had lived in Ryde for about twenty-eight years. He took a great interest in the welfare of the town, and as a large owner of property, he was most anxious to see its welfare promoted'.

'He considered that the water supply should be furnished pure in quality, abundant in quantity, and at the least possible expense. The present supply had none of these requisites, and the local Act was perfectly inoperative to benefit their condition in this respect'.

'The present waterworks (Upper Ryde) were never constructed with the idea of supplying the town. The fact was, that the Pier Company finding themselves short of what they required, took powers for a larger and better supply: it was then that the inhabitants expressed a wish for more water, and the Pier Company agreed to give them what was left, after they had taken as much as they required'.

As the main commercial company within Ryde, and with experience of supplying water, RPC might have taken a lead in obtaining a supply from the central downs, but their priorities were elsewhere, including making money by supplying ships with water, not Ryde residents. RPC did contemplate a private act to supply water but only in 1852, at the last minute just before a third (1853) local Act was passed.

Jonathan Dashwood (see Table 3) presented a plan to William Ranger's Inquiry for supplementing the water supply of Ryde by obtaining additional water from Quarry Springs and Monktonmead Brook, although he conceded that the water supply in Ryde would continue to be intermittent (i.e. set hours of the day), rather than 'continuous'. William Ranger did not find this plan credible or acceptable.

The Ranger report did not criticise the Town Commissioners directly, but the inadequate public

health provisions of the first and second local Acts were criticised. The authors of these Acts were not disclosed but undoubtably included Commissioners then in office. Key identified shortfalls included not being able to compel householders to connect their drains to public sewers that were laid and an inability to construct outfalls beyond the high tide mark which was the northern town boundary. It should be noted that William Ranger was of the view that disposal of sewage into the sea via outfalls was undesirable. Instead, sewage should be processed and used as fertiliser on nearby agricultural land.

Ranger did not document any significant opposition being presented during his Inquiry, in particular, to more investment being made in obtaining a water supply from the downs and for improved sewerage. He did concede that detailed proposals needed to be worked up and costed and, although he could not say what the exact cost would be, he was certain that it would be affordable. Based on his experience, Ranger anticipated that the greatest opposition would not necessarily come from those most well-off, but rather from the owners of housing occupied by the poor (see Table 4). This is presumably because these owners would find it difficult to recover their increased costs.

William Ranger recommended that Ryde should adopt PHA 1848 provisions and a government Order was prepared to that end, but implementation of the Order was left to the ratepayers of Ryde (see Table 1). Ranger noted that the mortality rate for Ryde was 25 per 1000, above the threshold of 23 per 1000 for imposing PHA 1848, but he accepted that 'many invalids resort to Ryde' at a time when 'their chances of recovery are all but hopeless' and that this contribution to the mortality rate was difficult to determine and apply the necessary correction.

Second Ryde Ranger Inquiry (1852)

As noted above, the original eastern border of Ryde was Monktonmead Brook but, as the population increased, an expansion in housing extended beyond this watercourse. The inclusion of these additional individuals within the remit of the Ryde Town Commissioners (with implied responsibility of supplying water and adequate sewerage) was debated in 1852 by a second Inquiry chaired by William Ranger. Inclusion was argued for on the grounds that if inhabitants outside the town boundary were left at risk of outbreaks of infection through drinking contaminated water, infection would inevitably be imported and affect existing residents of Ryde. Extension of the boundary was argued against by some wealthy house owners who would be included but had large grounds with their own private wells. They objected to paying higher rates. Extension was also objected to by some, on the grounds that they would be subsidising newcomers. Although occurring many years later, it is ironic that in 1933, as the result of a central government 'efficiency reform' of local government, the Urban District Council of St Helens was incorporated into the Borough of Ryde, along with a range of water supply and sewerage challenges.

Rejection by Ryde of PHA 1848 provisions

During and following the first two Inquiries chaired by William Ranger, the Town Commissioners and ratepayers (reportedly a majority) were opposed to adoption of PHA 1848 provisions. The reasons for this included: not wanting to pay higher rates, even for an improved water supply and sewerage; not wanting to expand the boundary of Ryde; and wanting to maintain independence from central government. However, those opposed to adoption had to concede that Ryde needed water from an external source (and an improved gas supply). As an alternative, a compromise third Ryde local Improvement Act was proposed, including provision to elect Commissioners. Over twelve months of debate and politicking, the public health party conceded that they had been unable to galvanise sufficient support for the adoption of PHA 1848 and a third Act was better than the *status quo*. In the interim, a number of private capital schemes to supply water to Ryde were proposed. One got as far as advertising in newspapers the intention of seeking a local Act of Parliament but progress stalled, leaving the Improvement Commissioners and public funding to provide for Ryde.

Third Ryde local Improvement Act (1854)

The third Ryde local Improvement Act of 1854 increased the boundary of the Improvement Commissioners from 1⅛ square miles to 1⅞ square miles, although most of the increase was foreshore (see Table 5). The new Commissioners appointed Francis Newman as their surveyor (see Table 3), who apart from one brief break, was to serve Ryde for many years.

After they were constituted under the 1854 Act, the new Commissioners established a water sub-committee. This reported on 30th of September 1854 that they had appointed and taken advice from Mr Easton (see Table 3) and account of the 'opinions and feelings of ratepayers'. Even though Quarry Spring (see Table 2) was not mentioned in the newspaper notice for the 1854 Act, the committee took time to conclude that as a source it was likely to prove insufficient; and in any case it would cost more than Ashey. The committee further confirmed that the estimated capital and revenue costs of Ashey (£15,500/£524) would be less than Alverstone (£23,000/£900). Mr Easton advised that

> *'his most decided opinion (indeed that he would guarantee) that an abundant supply of water, sufficient for all the requirements present and future of the town, could be procured from the Bloodstone (Ashey) source'.*

The committee selected Ashey by 13 votes to 8, with one abstention. Mr Barrow (see Table 3) voted for Ashey stating,

> *'he had always been an advocate for the Alverstone source, but after Mr Easton's assurances and the expressed feelings of the public, he did not hesitate to support the immediate adoption of the report of the committee'.*

Contracts were let for construction of waterworks at Ashey but the IWO was indignant that Easton and Amos (E & A, see Tables 1 & 2) were given the

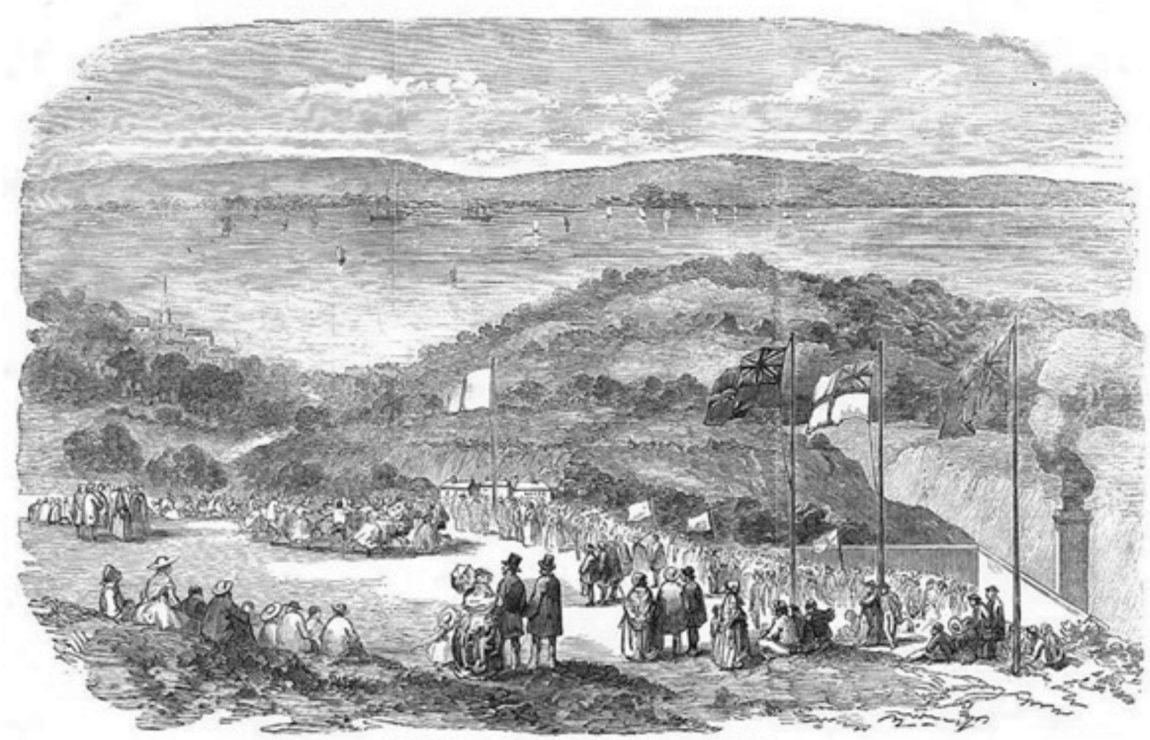

Fig. 2: Fête at Ryde, Isle of Wight - inauguration of the waterworks. View from the new waterworks at Ashey, north towards the Solent. The chimney is of a steam engine boiler house. Residents and children attending the opening can be seen in the centre. On the right, in the distance, is Ryde. The steeple is on St Thomas Church tower. It was removed in 1947
(From The Illustrated London News)

contract for a steam engine, although theirs was not the lowest tender. Just before completion of the works, the IWO reported (16 June 1855)

> *'The Water Committee beg to assure the Board (of Commissioners) that there is no foundation whatever for the various reports which have been circulating that the wells at Ashey are dry, or that the water has almost entirely disappeared. They believe that there is at this time quite as much water as at any period since the wells have been sunk, and which, when completed they have no doubt will be found to yield quite sufficient for the requirements of the town'*.

In the event, this reassurance turned out to be false and the rumours true.

A celebration for the new Waterworks was held on Thursday 28th June 1855, when a procession of carriages, dignitaries and more than a thousand children processed from the centre of Ryde to Ashey. At the works there was a band, speeches and refreshments, before the procession returned to Ryde. That evening there was a banquet at the Town Hall. However, in spite of the celebrations, and due to problems with pipes, a partial supply did not reach Ryde until Friday 7th September, when the fountain in front of the Town Hall was turned on.

3. Failure of Ashey waterworks, adoption of the Local Government Act 1858 (LGA 1858), Ryde Waterworks Act and establishment of Knighton waterworks

Jubilation over Ryde's Ashey waterworks was short-lived in that although the water supply to Ryde was plentiful over winter, during the summer there was severe shortage. Looking back at this period, William Pullen, the clerk to the Improvement Commissioners related:

The Ashey waterworks

> *'were completed in 1855, and the supply commenced in December of that year. In the summer of 1857 the first complaints of the supply being inadequate reached the ears of the Commissioners, who at once consulted their engineer, Mr. Easton, and by his advice they deepened their wells at Bloodstone springs, and ran galleries* (adits) *for the purpose of intercepting the water at the cost of £2,600. In September, 1859, the supply of water became very scarce, and the Commissioners determined to apply to Parliament for additional powers. The supply was then reduced to two hours every alternate day, the total supply for the two days being only 104,000 gallons, and they were obliged to refuse to supply water for any other purpose than for strictly domestic use. They could not supply the higher levels of Ryde at all from want of pressure'*.

During summers in the late 1850s, the inhabitants of Ryde again had to resort to shallow wells within the town, with the risk of disease transmitted by polluted water. As indicated above by Willam Pullen, towards the end of 1859, Ryde Improvement Commissioners reluctantly had to concede that further increasing the depth and driving adits from the wells at Ashey, during most summers was not going to produce sufficient water for Ryde. The debate about whether to go to Alverstone or Quarry Springs was reopened, but this time Knighton was the third choice: Ryde had already been to Ashey. Because of the perceived urgency of the situation, the Commissioners were prepared to pay for a new local Act of Parliament, but hoped that if they adopted LGA 1858, they could obtain a *gratis* Government Order (that gave equivalent powers). LGA 1858 had

replaced PHA 1848 and entailed less central government control; this had been a reason why Ryde had previously refused to adopt PHA 1848.

In 1860, William Ranger held a third Inquiry, this time to consider the LGA 1858 Order that Ryde had requested although, at that point, the Commissioners were still undecided over Alverstone, Quarry Springs or Knighton. Many ratepayers favoured Quarry Springs; being the closest, they felt sure it would be the cheapest. Later that year, government law officers concluded they could not issue a LGA 1858 Order, as because Ryde had adopted the Act late in the year, it made application before empowered to do so. Later in 1860, Ryde Improvement Commissioners promoted a fourth local Improvement Bill, but this failed.

In 1861, the Commissioners promoted a further Bill, and the House of Commons committee on the preamble to the Bill sat on March 15th 1861. The IWO report on the proceedings noted that at least three witnesses were called:

William Henry Pullen who was clerk to the Improvement Commissioners noted that the Commissioners had

> *'decided over and over again that they must have an auxiliary water supply.'* Also *'they had not taken any water from the Alverstone springs* (implying that under their third Act, they had a right to do so), *as the feeling of the inhabitants of Ryde was against it, in consequence of the character of the water.'*

Mr Riddett, past chairman of the Commissioners, related

> *'Alverstone springs were very bad, and the water could not be used without an expensive system of filtration. When he saw the Alverstone springs the water was of the colour of coffee — it was most disgusting. The water certainly might be filtered, but it could never be so good as pure water, it possessed qualities filtration could not remove. The Knighton water was harder than the Alverstone water. It was certainly an advantage to have soft water for washing, but softness would not counterbalance impurity'.*

Mr Thurlow, the present chairman of the Commissioners, stated

> *'there would be no difficulty in filtering the Alverstone water beyond the expense. He should have taken it if it had not been for the Knighton springs, which were so much better. The extra expense to filter the Alverstone springs would be £1,200 more than the £7,000 now proposed to be raised* (for waterworks at Knighton)'.

Also in 1860, it became evident that Thomas Webster (see Table 3) was likely to succeed in obtaining a local Act (the Isle of Wight Waterworks Act 1861) and this would prevent Ryde accessing Alverstone (had they wanted to). Yet again, the Commissioners explored the practicalities of Quarry Springs as a source for Ryde, but finally concluded it would not suffice, leaving the town with Knighton and the expense of a fourth local Act – Ryde Waterworks Act 1861 (RWA 1861).

Knighton Waterworks

There was no grand opening of Knighton water works. In September 1861, a temporary, portable steam engine began pumping water, abstracted from the Knighton millpond, over the downs to the reservoir at Ashey. This provided Ryde with a welcome additional 120,000 gallons of water a day. However, pumping was soon stopped by an injunction taken out by Thomas Webster, who wanted his claim for compensation resolved before Knighton waterworks operated. Later a permanent steam pump was relocated to Knighton from Ashey (see Table 2).

In 1862, William Ranger held his fourth and final Inquiry in Ryde, as borrowing allowed under RWA 1861 had been exceeded. The Commissioners needed a further £3500, to cover compensation owed to Thomas Webster and the Carters (owners of Knighton Mill). The IWO was very critical of poor attendance at the one-day Inquiry. J. H. Hearn, a ratepayer, objected to the payments on legal grounds, but nothing came of this.

By the beginning of 1865, concern was expressed that at the peak of summer, the existing steam engine at Knighton was having to pump for 14 hours a day, to keep up with Ryde's demand for water. This was putting the engine at risk and the consequences, if the engine failed, were deemed to be catastrophic. In response, the Commissioners applied for an Order under LGA 1858 to increase borrowing for a new engine, and an Inquiry was held by Robert Morgan (not William Ranger) on 29th March 1865. In September 1865, James Easton undertook a site visit and produced a plan for upgrading Knighton waterworks. A new engine was supplied by Landale and Dale of Kirkcaldy, at a cost of £3000. The engine's nominal duty was 40 horsepower, but could extend to 80 horsepower. It pumped 400 gallons a minute to the reservoir at Ashey, 300 feet above. The volume was equivalent to 300,000 gallons in 24 hours, almost twice Ryde's existing consumption. The new engine started work on 22nd November 1866, with the old engine remaining in reserve.

As touched on in Tables 1 and 2, there were many subsequent developments at Knighton, but these are outside the time range of this article.

Ryde debates the inclusion of St John's and Haylands within its boundary, but encounters legal difficulties of its own making

Late in 1866, the Ryde Town Commissioners petitioned central government for an Order under LGA 1858, for the inclusion of St John's and Haylands within an extended boundary for Ryde. As noted above, a previous extension of the boundary of Ryde had been considered by the second (1852) Ranger Inquiry, and this extension was later included in the third (1854) Ryde local Act (see Table 5). This time the elected Commissioners were proactively working out of enlightened self-interest, in that they perceived a risk of infectious disease being imported into Ryde from adjacent neighbourhoods that lacked a piped water supply and had inadequate sewerage.

An Order was issued in 1867, but Ryde found that it could not implement it because the newly incorporating neighbourhood would have been subject to LGA 1858, but not to the local Ryde Acts that were still in force. This would have created an anomaly with the existing town.

4.Borough status conferred on Ryde and demise of the Ryde Improvement Commissioners

For some time there had been debate over whether Ryde should seek to become a Borough. Since Medieval times, Newport had historic Borough status yet, in the nineteenth century, Ryde was the faster growing town. In 1868, Borough status was granted to the town of Ryde, by Royal Charter. This measure did not actually abolish the Ryde Improvement Commissioners but, after 39 years in existence, they voluntarily transferred their assets and responsibilities to the new Borough. However, some clauses of the local Ryde Acts continued to operate and caused unnecessary expense and inconvenience. These were finally repealed in 1876, by a Provisional Order of the Local Government Board that was confirmed by a subsequent national Act of Parliament.

Unfortunately the Borough of Ryde continued to have difficulties with its water supply and its 'Centenary Handbook, 1868 to 1968' (Bird, 1968) noted:

> *Many were the promises and disappointments in this endeavour.*
>
> *The Ashey Waterworks were constructed in 1855, and a great celebration was held to inaugurate the supply to the town, but the promise of an adequate supply from this source was soon disproved, and a further source was developed at the Mill Well and in the Greensand at Knighton on the South side of the Down. Here again, the promise of adequate supplies was doomed to disappointment in periods of drought, and many schemes were tried in an endeavour to improve a supply which at times was so lacking as to constitute a serious threat to the health and welfare of the Borough.*
>
> *The supply was augmented in the year 1946 by linking up with the Sandown-Shanklin supply from the river Yar, and sufficient quantities were maintained by the joint authorities up to the date of the formation of the Isle of Wight Water Board, who became responsible on 1st April, 1951, for the control of the whole of the public water supplies throughout the Isle of Wight.*

Conclusions

The initial water supply of Ryde was mainly shallow wells within the town. Most wells were private. There were some public wells, although it is unclear how these were regulated and or protected, if at all.

The original (1829-1847) Town Improvement Commissioners prioritised a market building/town hall, and had little money left over for public health provision.

Eventually it became apparent that an adequate water supply for Ryde depended on piping water from the central chalk downs.

Had it secured Alverstone as a water source, Ryde could have had abundant water, but this would have deprived, and might have adversely affected, the development of Sandown and surrounding districts. As it was, in turn, Ashey and Knighton proved inadequate for the water demands of Ryde.

Eventually in 1876, remaining local Acts had to be repealed/amended as they were impeding the governance and progress of Ryde.

Post World War 2, an adequate water supply for Ryde required sourcing water from Sandown-Shanklin UDC. More recently for the IOW as a whole, demand has outstripped supply and this has necessitated the importation of water from the mainland (via under Solent pipes).

Throughout its history, sewerage solutions for the IOW have been driven by local interests and short term gains. There could have been more environmentally friendly solutions, but at a cost.

Some questions not answered by this article

Who were the main instigators of Ryde's first Improvement Act 1829? Were 'business interests' the driver, with the Player family neither objecting nor acquiescing?

Why was so much prominence given to Ryde Town Hall? Was there perceived potential to make money from a Market or 'prestige' competition with Newport?

Who were the main petitioners for the first Ranger Inquiry? This is difficult to research as it was prior to the re-establishment of IWO.

The boundary of Ryde Borough, when it was incorporated in 1868, was it the same as for the 1854 Act, i.e. when were St John's and Haylands included?

Why was James Easton retained from 1854 to 1866 by the Improvement Commissioners and not held accountable for the selection of Ashey?

Acknowledgements

Records Office staff, Linzi Adams.

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Authors: Paul Bingham **email:**iowpaulb@aol.com
Fred Caws **email:**fred@goodcaws.org.uk

Table 1: Timeline of water supply to Ryde, Isle of Wight

1781	**Lord of the Manor, William Player** initiated the urbanisation of Ryde by laying out Union Street and selling *annual* leases for building plots. Unfortunately, the lease conditions were insufficient to ensure the safe disposal of sewage.
1810	**Jane Player's Act of Parliament** extended granting of leases to 3 lives or 99 years. After the death of her son George in 1843, the manor of Ryde was divided into two parts, controlled respectively by her grandson, Dr James Player Lind, and the husband of her grand-daughter, Captain Brigstocke RN. 'Lords of the Soil'.
1812	**Ryde Pier Act**. Ryde Pier was one of the first to be constructed in the UK. It allowed passengers to disembark at low tide and walk dry-footed to shore. As an additional money-making venture, Ryde Pier Company (RPC) noted the potential of selling water to passing ships. After a delay, the company bought out the existing Ryde waterworks of John Cooper and partners. In the 1830s, RPC constructed a water-works in upper Ryde, including a number of wells, reservoirs and a main supply pipe down the hill and along the pier. In the first instance, these works were constructed to supply ships. Later, surplus water was piped to subscribing residents.
1813	**IOW Roads and Highways Act** established Highways Commissioners and unified all IOW roads, apart from those in the Borough of Newport and West Cowes. Ryde rate payers subsequently argued they were paying £700 annually to the Highway Commissioners but receiving repairs in Ryde to the value of only £300 (First Ranger report p 59).
1829	**Ryde Improvement and Market Act** established Ryde Improvement Commissioners, but their main focus became Ryde town hall and marketplace, with little money left for the provision of public sewers etc. The Commissioners had no powers to compel households and businesses to join their premises to public drains that were constructed.
1844	**RPC waterworks** were leased to Mr Jonathan G. Dashwood. Previously, Dashwood sank a well on his own property on the Strand and installed a steam pump. However, the combined supply was still insufficient to keep pace with the growth of the town. Inadequate sewers and poor supply of piped water left many continuing to draw water from wells at risk of contamination from nearby cesspits.
1847	**Second Ryde Improvement Act** released Ryde Commissioners from having to pay off 1/20th annually of the money they had borrowed under the 1829 Act. The new Act also allowed them to discontinue contributing to Highway Commissioners roads outside Ryde, and be responsible for their roads only. Spending on sewers increased, but the Commissioners were constrained by the absence of a power to construct outfalls beyond the high-water mark (northern town boundary).
1849	**UK Cholera Pandemic** resulted in 64 deaths in Ryde. The death rate in Newport IOW was slightly higher.
1840s	**The West Outfall** extension to low water-mark was constructed through a voluntary subscription, as a wooden trunk at a cost £125 (First Ranger report p 8 & 59). This proved to be only partially effective because of unfavourable currents at the point of discharge. **The East Outfall** to low water mark was constructed later than the Western Outfall, but when, and how it was funded has not been identified.
1851	**First Ryde Inquiry,** chaired by William Ranger, was petitioned for by 'Public Health Party Memorialists'. The resulting report documented the inadequate water supply and deficient sewerage of Ryde and recommended adoption of Public Health Act (PHA)1848 and significant expenditure on water supply and sewerage.
1852	**Second Ryde Inquiry,** also chaired by William Ranger, recommended inclusion of Oakfield and the Strand within Ryde Commissioners' boundary.
1852	**Alverstone,** south of the Downs, had been suggested as an abstraction source by Charles Colenutt and others to the first Ranger Inquiry (p 22). Henry Austin, Consulting Engineer to the Government Board of Health (GBH), visited and recommended Alverstone over Ashey. Ashey was closer to Ryde, spring rather than river and thus cleaner, but its potential volume was questionable.
1852	A number of **private company water schemes** for Ryde that would require Parliamentary local Acts were proposed, including one for Ashey that engaged Easton and Amos (E & A) as engineers, a scheme for Alverstone that purported to have philanthropic intent, and a scheme by RPC. The Ashey scheme got as far as giving formal notice in newspapers.
1852	**St Helens Vestry** meeting objected to a proposal to include Oakfield and the Strand within the jurisdiction of Ryde Town Commissioners, arguing St Helens already had a sufficient water supply and drainage.

1853 to 1854	Adoption of PHA1848 was favoured by the Isle of Wight Observer (IWO) and 'Public Health Party Memorialists', but opposed by the Health Commissioners and as reported in newspapers, by the majority of ratepayers. The GBH eventually issued a draft Order for adoption of PHA 1848, but allowed Ryde to decide whether to implement this or not, instead of adoption of PHA 1848, In 1854 Ryde Commissioners obtained a **further (third) local Improvement Act.** The new Act was drafted to be as similar to PHA 1848 as possible, but without conceding formal central government control. New Commissioners were to be elected , rather than automatically qualifying on the basis of wealth. The new (1854) Commissioners continued gradual investment in sewers. They appointed E & A as their consulting engineers. Following advice of E & A, Commissioners selected Ashey as the new water source for Ryde. RPC and JG Dashwood were compensated for their redundant waterworks. The IWO (24 Dec 1853) was, however, concerned that the drafting of the third Act was more in favour of the interests of landowners than those of individual residents.
1855	**Ashey waterworks** opened July 1855 and supply reached Ryde September - December 1855. During summer, the supply from Ashey proved inadequate, in spite of subsequently deepening and extending adits from the base of the wells.
1859	**Ryde Commissioners adopted the Local Government Act 1858** (LGA1858), largely as a consequence of water shortage. This legislation had replaced PHA 1848 and entailed less central government control. Under LGA 1858, Ryde made application for an Order for compulsory acquisition of Alverstone, Knighton or Quarry Springs, and increased borrowing to construct new waterworks. As it was considered the application might fail, at the same time the Commissioners gave notice of a local Act, citing the same three location options. Many ratepayers favoured Quarry Springs. Mr Barrow proposed a private company to obtain an 'auxiliary' supply for Ryde, but this initiative was rejected by fellow Commissioners.
1860	**Third Ryde Inquiry,** again chaired by William Ranger, debated the Commissioners' application for an Order. Subsequently, central government law officers concluded that because Ryde's adoption of LGA1858 was late, an Order could not be issued in the time-frame Ryde required. During 1860, a private Ryde Waterworks Bill, was promoted by the Improvement Commissioners, but it failed.
1860	Thomas Webster and others formed a private company to abstract water at Alverstone to supply Sandown & surrounding districts. Subsequently, they obtained the Isle of Wight Waterworks Act 1861.
1861	**Ryde Waterworks Act 1861** (RWA1861) was obtained by the Ryde Commissioners. This facilitated construction of a waterworks at Knighton and more borrowing. The Act entailed pumping water from Knighton to Ashey, for onward distribution to Ryde. However, demand in summer soon exceeded supply, and Ryde continued to be short of water.
1862	**Fourth Ryde Inquiry,** chaired by William Ranger made application to further increase borrowing. Costs, including compensation to Thomas Webster and the Carters (owners of Knighton Mill), as abstraction had exceeded the provisions of RWA1861.
1865	**Fifth Ryde Inquiry,** chaired by Robert Morgan, debated borrowing for a new engine at Knighton, upgrading the two Ryde outfalls to iron pipes, paving of the Esplanade, and inclusion of St John's within the town boundary.
1866	**A more powerful pump installed at Knighton,** with the old pump retained as a backup.
1866	**The Newchurch Parish Act** 1866 divided the parish of Newchurch into three, with the north portion becoming the parish of Ryde.
1867	**Sixth Ryde Inquiry,** chaired by Robert Morgan, further debated inclusion of St John's and Haylands within the Town Commission boundary. An Order was issued, but could not be implemented.
1868	**Borough status conferred by Royal Charter on Ryde,** following a number of years of debate over its potential advantages and disadvantages. Later that year, Ryde Commissioners voluntarily transferred their assets and responsibilities to the new Borough.
1872	**Public Health Act 1872.** Ryde became an Urban Sanitary District**.**
1876	**Provisional Order of the Local Government Board,** later confirmed by an Act, repealed, altered, and amended certain sections of the Ryde Improvement Act 1854 and Ryde Water Act 1861. These redundant pieces of legislation were entailing additional expenditure and impeding progress.
1881	**Dr Ballard's report** on the 'Sanitary Conditions and Administration of the Isle of Wight' was published. It found Ryde largely satisfactory from a sanitary perspective, but surprisingly did not highlight the inadequacy of its water supply.
1888	**Supply obtained at Knighton at depth from Lower Greensand.** The high iron content had to be 'treated'.
1933	**Ryde Borough Council absorbed St Helens Urban District Council (UDC)** under local government reorganisation.

1946	**Additional water for Ryde obtained from Sandown-and Shanklin UDC,** largely from Alverstone.
1951	**Isle of Wight Water Board** took over responsibility for water supply from IOW local authorities.
1974	**Southern Water** took over responsibility for sewerage from IOW local authorities.

Table 2 : Water Sources that supplied Ryde

Waterworks of Cooper, Denham and Baker. Little is known about early Ryde entrepreneurs who established a waterworks in lower Ryde, based on shallow wells, and sold water predominantly to passing ships. Later these works were acquired by RPC.

Upper Ryde waterworks. These were constructed by RPC to collect and store water by developing a number of existing wells in the superficial gravels. At the time, there was a complaint that construction of the works diminished flow in adjacent public wells. The works was located in the area of what is now West Street and John Street. The water (presumably untreated) was piped down the hill to the pier, and then along the same, to supply ships. Later the works was leased to J G Dashwood, who supplied water not required by ships to houses by pipe. The subsequent development of a waterworks at Ashey made the upper Ryde works redundant. Under the 1854 local Act, RPC was compensated, and these former works were subsequently built over.

Strand waterworks. These works were established in the 1830s/40s by J. G. Dashwood (see Table 1). They consisted of a well 63 feet deep (19.2m) and a steam pump to draw water. The Strand is marked on the map overleaf (Fig.3.) If undertaken at this point, a borehole of over 500 metres would be required to reach the underlying chalk.

Quarry Springs. At the time that Ashey was being considered (1852/3), Quarry Springs was noted as a potential source for Ryde, and then again at the time Knighton was contemplated (1859). As can be seen from the map, Quarry Springs is located conveniently close to the town of Ryde. The quarry was owned by Dr Lind and comprised of Bembridge limestone. Based on a modern understanding of geology, it is certain that the quarry site would not have yielded significant quantities of water for Ryde.

Ashey waterworks. These were constructed with powers obtained in the 1854 Ryde Local Improvement Act. There was a natural spring close to the site but, rather than collect from the spring directly, an intercepting well was dug and water was drawn by a steam pump. The site itself encompasses two distinct types of geology. To the south there is chalk that consists of almost vertical strata, due to folding. To the north lies 'clay', that is younger than the chalk. It appears that initially it was planned to dig a single well 30 feet deep in the chalk. At some point this was changed to two wells, one in the chalk and one in the clay, each with a steam pump.

Very soon after the official opening in July 1855, it became apparent that during summer Ashey could not provide the quantity of water that Ryde required. In an effort to increase supply, the clay well was deepened and adits were dug at its base. Unfortunately, in spite of considerable expenditure, significantly increased flow was not obtained. It can be seen from the map that the catchment of Monktonmead is relatively small; however, prior to construction of the Ashey works, this was an unrecognised constraint.

Ashey became the location of a large service reservoir that supplied Ryde by gravity. Initially, no treatment of water was undertaken at Ashey.

Knighton waterworks. The site is located south of the Downs and works were constructed with powers obtained in the 1861 Ryde Waterworks Act. Knighton was resorted to because sufficient water could not be obtained at Ashey and the alternative of Alverstone (see below) was a river source. Public opinion and the Commissioners were opposed to the additional cost of filtration, some maintaining that filtration could not fully purify this source. Prior to the construction of waterworks, Knighton was the location of a mill powered by water from a nearby spring. Water naturally flowed from Knighton to Alverstone and then onto Brading Haven and the sea. Initially in 1861, water was abstracted from Knighton mill pond and pumped, using a temporary steam pump, over the downs to the reservoir at Ashey. Later a pump was relocated from Ashey clay well to Knighton. Subsequently a well was dug at the site of the mill so the spring water was intercepted, improving the quality of the water, as this eliminated surface flow to the mill ponds. In 1866, as pumping capacity had become the key constraint, a more powerful pump was installed at Knighton. Later in 1888, a deep well was dug into lower Greensand. Water from this source required treatment to reduce its high iron content. Unfortunately, the supply from Knighton could not keep up with demand and, in spite of subsequent developments, Ryde remained continually short of water.

Alverstone. Alverstone Mill had been proposed in 1851, at the first Ranger enquiry, as an abstraction site to supply Ryde. The disadvantages of this proposal was that Alverstone is south of the downs, and piping and pumping would have cost more than, say, from Ashey. In addition, as a river source, to make it drinkable, water from Alverstone required treatment. Nevertheless, Alverstone became the source for Thomas Webster's 'Isle of Wight Waterworks', that for many years successfully supplied Sandown and surrounding districts. Ironically, under an agreement between local authorities, from 1946, Alverstone supplemented the supply of Ryde.



Fig. 3: Map showing water sources for Ryde with inset showing the sewers and outfalls in Ryde

West outfall. Constructed in the 1840s as the outfall (final common drain) for most of the original town of Ryde, but with the exception of its eastern margins.

East outfall. Constructed later than the west outfall, it drained the eastern margin of the town that sloped down to Monktonmead Brook and also the neighbourhoods that developed east of this river. Subsequently, both western and eastern outfalls were extended to low water and still later, replaced with iron pipes.

Prior to 144 ratepayers of Ryde petitioning for an enquiry under PHA 1848, key individuals concerned with the water supply and sewerage of Ryde are difficult to identify. Initially the supply of water was in private hands and J. G. Dashwood was a key individual (see below), but clearly there were other front-line workers, including water carriers etc. On the other hand, while it is evident that Ryde Improvement Commissioners failed to regulate and provide effective sewerage for Ryde, who the key responsible individuals were, and the involvement they had in RPC which for a time prioritised the supply of water to passing ships, requires further research.

Table 3: Some of the key individuals involved with the water supply and sewerage of Ryde

Benjamin Barrow (1814-1901). In 1848, aged 34, Benjamin Barrow moved to Ryde and became its lead surgeon and a renowned medical practitioner. Later in 1881, when the British Medical Association held its national annual meeting at Ryde, Barrow was President. He was also a prominent local politician, being elected Mayor of Ryde on nine occasions and before there was a requirement for a formal appointment, he acted as honorary Medical Officer of Health.

Although his independence would have been open to question, the account he gave to the first Ranger Inquiry made clear his detailed knowledge of the public health hazards of Ryde and the state of the poor. With respect to Ryde's water supply, Barrow was one of the original campaigners ('memorialists') for adoption of PHA 1848 and was in favour of selection of Alverstone as the water source for Ryde (see p9 of this article).

Having become an Improvement Commissioner and listened to public opinion, Barrow switched his allegiance to, and defended, Ashey. In this he was strongly criticised by George Butler/IWO. When the first weekly edition of the re-launched IWO had been published, readers were disappointed that there was no report of the weather of the previous week, as there was in other local papers. Benjamin Barrow came to the rescue, as for some time he had been making daily records of the weather at his residence in Ryde. However, in March 1855, Barrow fell out with George Butler/IWO and ceased sending reports to the newspaper, although for a time he continued recording the weather.

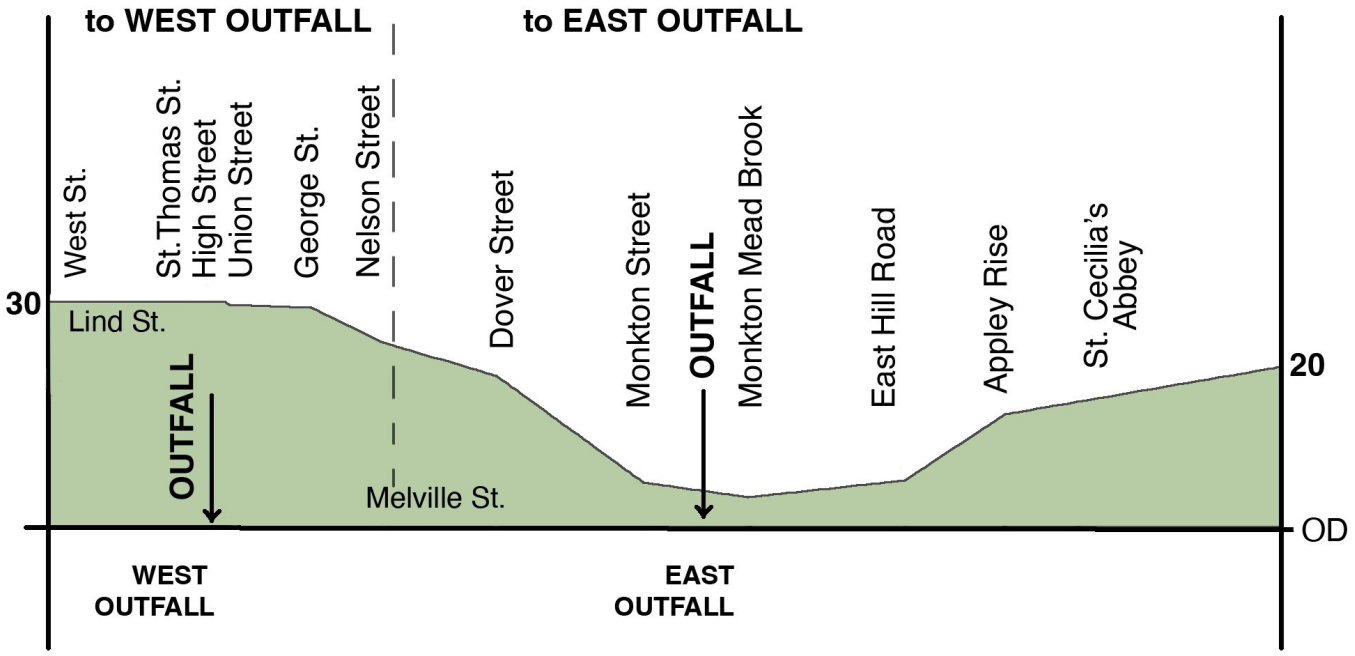

Fig. 4a: Cross section of Ryde North

The section shows how properties from West Street, the High Street and George Street are collected at Lind Street and Cross Street and taken downhill under the roads leading to the Esplanade and the West outfall.

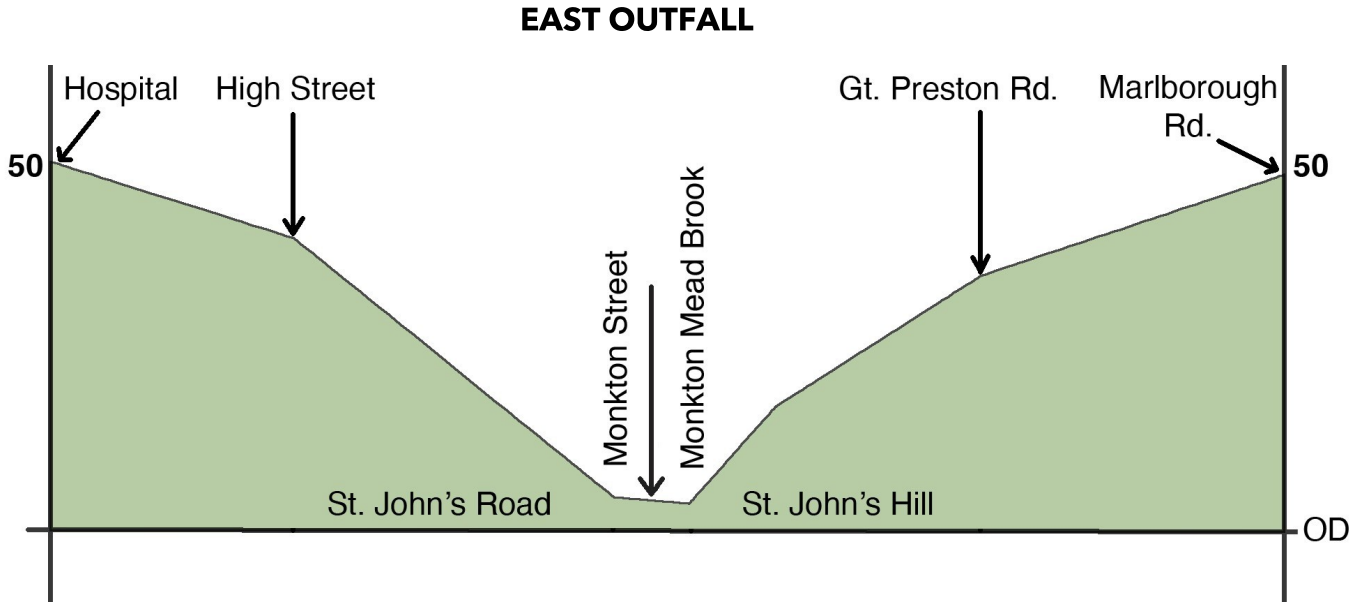

Fig. 4b: Cross section of Ryde South

The properties on a line from the Hospital to St John's Road and down to the Monkton Mead, as well as Oakfield and Elmfield, are collected by sewers which run alongside the brook to The Strand then out to low water mark as the East outfall.

George Butler (1820 -1865) was born in Ryde, attended its National School and established a printing and book binding business. In 1852, he re-launched the IWO and became editor, although he contributed much of the copy. Butler was fiercely critical of many of Ryde's politicians and aristocracy. In respect of the water supply, Butler favoured:

- The Ranger Inquiry recommendations/ adoption of PHA 1848
- Sourcing water from Alverstone rather than Ashey
- Awarding the contract for steam pumps to the lowest tender, rather than to E & A
- He also supported the opinions of George Morey over those of James Easton

Charles Colenutt (1813-1902). His obituary in the County Press noted: '*We have to record the death this morning (Friday) at his residence, Windsor Lodge, of Mr Charles Colenutt, who had almost completed his 89th year. Mr Colenutt, for a period upward of half a century, was one of the most prominent and influential men in Ryde and to him must be accorded much of the praise which those who directed the destinies of the town in the early stage of its career deserve. He was not a native of the place, although he belonged to the Island family which has lived here for so many generations, but came here at an early age, and served his apprenticeship with the late Mr Cutler. As long ago as 1841, however, he was in business as a brewer and wine and spirit merchant. As a businessman Mr Colenutt added keenness to industry. He was one of the members of the old Board of Commissioners, and was, we believe, the last of that little band who put their hands into their pockets and, at considerable personal expense, secured for the town the magnificent water supply we now enjoy. No doubt had they been less unselfish and had turned themselves into a company, they would each have made a fortune at the expense of the town. They did not do this, however, but secured the water works for the town, and by so doing deserve to be ever held in remembrance by its inhabitants. Although a member of the old Commissioners, Mr Charles Colenutt, we believe, did not secure a seat on the Council when the town was first incorporated, but did after the troubles of the infantile Corporation had subsided. For many years he was a very useful member of the Public Works and other committees. He was elevated to the Aldermanic Bench in due course and served the office of Mayor with credit to himself and satisfaction of the inhabitants, in the years 1879-80, and again in 1883. He was the oldest member of the Bench of Borough Magistrates. For many years he was a director the Pier Company, in which position his business acumen contributed to steer the company through a serious crisis, and to establish its prosperity. In his prime, Mr Charles Colenutt was one the finest men in Ryde. He stood some 6ft 3in in height, and was of a remarkably powerful physique, but for some years past, failing sight and the infirmities of his advanced age have compelled him to live very retired'.*

Jonathan Guy Dashwood (1806 -1859) was part of an important Ryde family that migrated from Whippingham. After his death, J. G. Dashwood was described in a legal notice as a 'plumber, painter, glazier and paper hanger', but unfortunately there was no obituary containing further detail. Earlier, Dashwood had developed a waterworks on his premises on The Strand and leased the RPC upper Ryde waterworks (see Tables 1 and 2). Dashwood presented a plan to William Ranger's Inquiry for improving the water supply of Ryde by obtaining water from Quarry Springs and Monktonmead Brook, but William Ranger did not find this plan credible. Later, Dashwood argued for Ashey as a source, warning residents in a pamphlet against Alverstone, as based on findings made on Thames water 'river water could never be microscopically pure' (IWO termed this 'Dashwood's Manifesto'). Consequent to the third local Act, Dashwood was compensated for investment he had made in supplying Ryde with water.

James Easton (1797-1871) was an engineer and partner of Easton & Amos, a manufacturer of steam engines. Initially engaged by a prospective private company to develop Ashey, he went on to persuade the Ryde (1854 local Act) Commissioners to select Ashey, initially giving them a guarantee of 300,000 gallons of water a day. Later he was released from this guarantee. Easton supplied two steam engines for Ashey, although he had not given the lowest tender. He continued to work for Ryde Commissioners, even after it became clear that Ashey had failed. Easton retired from his firm in 1866.

Mr George Morey (c1811-1860) lived in Ryde and in 1854 issued a pamphlet advocating that the lower ¾ of Ryde should be supplied by gravity from the spring at Ashey, without digging a well, and the upper ¼ should be supplied by moving Dashwood's existing pump from The Strand to Quarry Springs. Morey maintained that Ashey would never have enough water to supply the whole of Ryde, no matter how much digging was undertaken at that site.

Francis Newman (1831-1904) was noted by the County Press to be a native of the Isle of Wight, although subsequently his place of birth and education have not been determined. He was appointed in 1854 by the Ryde Improvement Commissioners as their surveyor and remained in post, apart from a short gap, until he was appointed as County Surveyor. Together with E & A and other consultants, Newman was responsible for Ryde's water supply and sewerage, along with the development of the Esplanade and Cemetery. In 1867, he was the architect of an extension of the town hall. In addition to his work as surveyor, Newman was a prominent promoter of the volunteer military movement in Ryde, a founder of the Ryde School of Science and Art and a senior Freemason.

William Henry Pullen (d.1879, aged 53). His IWO obituary noted '*It is with sincere regret we record the death of Mr. W. H. Pullen, for many years Clerk to the Board of Commissioners, and Town Clerk when the charter of incorporation was obtained. He retained the office of Town Clerk till the proposed purchase of the Gas Works created so much ill-feeling. The innuendos then thrown out against Mr. Pullen with respect to the Town Accounts by many members of the Ratepayers' Association were keenly felt by him, and when that party took the direction of affairs Mr. Pullen resigned office. The subsequent investigation of the accounts showed how unjust these*

aspersions were, and that Mr. Pullen had been a good and faithful servant of the town. Since he resigned office, however, his health has been gradually declining. He had always suffered from a spinal complaint, and of late years this seemed aggravated by other disorders. His death was, however, very sudden at the last. He was seized with an apoplectic fit on Saturday afternoon and on Sunday morning he expired. The funeral took place on Wednesday morning, when the following gentlemen testified their respect by attending at the Cemetery: Dr. Beaton, Alderman J. Dashwood, Mr. F. Newman (Borough Surveyor), Mr. E. Hopgood (Town Clerk), Mr. J. Flux (Clerk to the School Board), Councillors Riddett and Allen, Mr. Pack, and Mr. Flowers. The chief mourners were Mr. Allen and Mr. E. Joyce. The service at the grave was performed by the Rev. J. Thomas'.

William Ranger (1800-1863) was initially a mainland builder and surveyor. From 1848, he was appointed a Superintending Inspector to the GBH. In this role he undertook 'preliminary' inquiries into petitions from districts to adopt PHA 1848 and, for districts that had adopted PHA 1848/LGA 1858, requests for Provisional Orders. His published reports give important insights into the sanitary state of the districts he inspected, including Ryde.

Thomas Webster (1810-1875) was a barrister and authority on patent law who acquired property on the IOW. He purchased Alverstone Mill, he later conceded, as an investment because he perceived that it would become key to the water supply of the east of the Island. Through his business dealings, Thomas Webster was generally considered 'not a friend of Ryde'. His son Richard Webster became the first and only Lord Alverstone.

Table 4a: Rateable value of the houses of the town of Ryde reported to the First Ranger Inquiry

Rateable value	Number of houses
Under £2	18
£2 to under £4	154
£4 to under £6	296
£6 to under £8	199
£8 to under £10	95
£10 to under £20	289
£20 to under £30	178
£30 to under £40	73
£40 to under £50	51
£50 to under £60	22
£60 to under £70	19
£70 to under £80	7
£80 to under £90	10
£90 to under £100	5
£100 and over	7
Total	1423

Table 4b: Analysis of rateable values of houses of the town of Ryde reported to the First Ranger Inquiry

Total rateable value	£22,887
Mean rateable value	£16.08
Median rateable value	£8.94
Range of rateable values	£178
25th percentile	£5.24
75th percentile	£20.90
Interquartile range	£15.66
Upper outlier limit	£44.39
Number of outliers	96

Table 5: Area, length of roads, houses and rateable value of the Town of Ryde, sometime before and after enactment of the third (1854) local Ryde Improvement Act, and then at January 1858

	Prior to 1854 Act	**Post 1854 Act**	**Jan 1858**
Area	1⅛ square miles	1⅞ square miles	1⅞ square miles
Roads	9 miles 1 furlong 125 yards	10 miles 5 yards	11 miles 4 furlong 71 yards
Houses	1423	1554	1656
Rateable assessment	£22,887	£28,675	£30,265 10s

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AN IMPORTED MEDIEVAL PURBECK MARBLE FONT RECENTLY FOUND IN RYDE: ITS CONTEXT, ITS COUNTERPARTS AND ITS COASTAL SHIPMENT

David Tomalin

Abstract: *Two octagonal fonts of Purbeck 'Marble', decorated with low-relief arcaded panels of Early Lancet style, are specifically discussed. These are compared with further Wight fonts and other medieval imports of this prestigious stone. The early production of these fonts on the Isle of Purbeck is discussed and a single source is postulated. Analogy is drawn with Wight's shipment of Quarr Stone and an implied similarity in the use of 'quarr-house' workshops in Purbeck and Wight. General contemporaneity is postulated between the arrival of these decorated fonts and the construction of Early English nave arcades in seven Island churches.*

Keywords: Purbeck Marble, church fonts, medieval sculpture, Quarr houses, de Redvers, Norman-Gothic transition

The context of the Ryde font

In the autumn of 2022, a Purbeck Marble font of Late Norman style was found abandoned under a staircase in the Neo-Gothic church of St Thomas, Ryde . (Fig.1)



Fig. 1: The abandoned Purbeck Marble octagonal font as found in St Thomas's church, Ryde, in October 2022.

When this church was erected in the centre of this seaside town, in 1826, it replaced a chapel that had stood on this site since 1719 (Fig. 2). Prior to that date, the occupants of the minor coastal community of Ryde had been obliged to make frequent nine-mile journeys to the church of their mother parish at Newchurch (Fig. 3).



Fig. 2: Ryde chapel depicted in 1825. (After McInnes,1990)

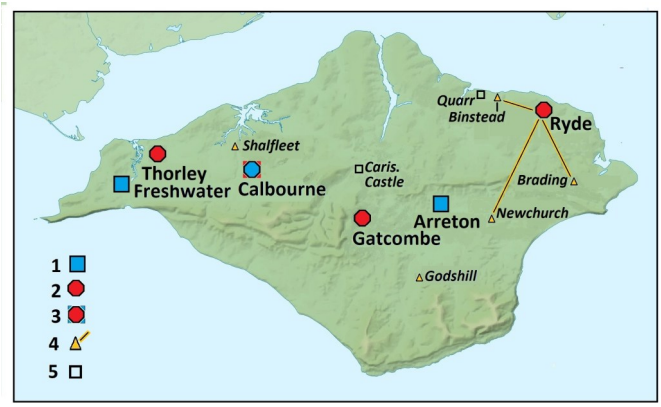

Fig.3: The location of Wight's Purbeck Marble fonts and some related medieval church components of this imported stone. 1 = square font; 2 = octagonal; 3 = square to octagonal conversion; 4 = possible original possessors a Purbeck font including the Ryde font (arrowed) 5 = other imported Purbeck Marble sculpted stonework

With little evidence of any greater antiquity for the Ryde chapel, it is difficult to perceive a direct association between this Norman font and the church history of this Victorian town (Stone, 1912, 177–178; Lloyd & Pevsner, 2006, 225–227). Having been furnished with a substantial stone monopod font of contemporary Neo-gothic style, the church of St Thomas had no obvious need for a font of such antiquity.

The geological source of the font

The Purbeck Marble composition of the Ryde font can be readily matched with an array of analogous medieval fonts quarried or mined from a confined facies at the junction of the Jurassic and Cretaceous limestones in and adjacent to the Isle of Purbeck (Arkell, 1947, 133–138; Thomas, 1998, 53–64 & 2008, 72–75; Béneult, 2022, 13, Fig. 17). It is here that the working of this particular limestone stratum, traditionally dubbed 'Purbeck Marble', claims a long history.

First exploited in Romano-British times, Purbeck Marble was still mined by traditional methods in the early decades of the twentieth century (Benfield, 1990, 11–14). The adjacent limestones have long provided a range of attractive building stones, some of which are still quarried in the Dorset districts of

Purbeck and Portland. Confined to the Isle of Purbeck, the 'marble' stratum has been progressively found to be thin and elusive.

Since medieval times the 'marble' has been mined in Purbeck, mostly by means of inclined adits. These generally descended at some 45° while pursuing the marble stratum to a depth of some 30m. These adits also gave access to lateral galleries, colloquially named 'lanes'. On occasion, a maximum thickness of 1.2m had been encountered in the marble seam. This could provide for a font, a coffin, or for 'drum' segments for robust architectural columns. Later, the common thickness seldom exceeded 0.3m and by the 1930s the seam was effectively exhausted (Arkell, 1947, 134–135; Benfield, 1990, 47–50).

The work of Norman 'marblers'

The Ryde font shares its form and decoration with a notable body of similar Purbeck Marble fonts scattered across the southern counties of England (Leach, 1978, 81). These attest to a time when a thick and rewarding portion of the marble stratum was being successfully worked somewhere on the Purbeck Limestone outcrop. Current indications point towards the parish of Corfe where the well-known Norman castle was one of the earliest to be constructed in the immediate aftermath to the Norman Conquest. Once quarriers and stonemasons had assembled for this task, here was ready opportunity to expand and develop the Purbeck marble industry.

Diverse evidence of marble carving in and around Corfe village has been helpfully reviewed in studies by Dru Drury and John Blair. These embrace documentary evidence concerning craftsmen or 'marblers' whose architectural products were being shipped to Canterbury, London, Norwich and Durham before the close of the twelfth century (Dru Drury, 1949; Blair, 2001, 49).

Although some heavy architectural components are sometimes identified in early documentation, we have yet to find mention of fonts. The simple decoration and uniformity of these particular items seem suited to a single source where production may have been promoted by the good fortune of locating a particularly thick and accessible marble seam.

While Corfe may have accommodated a community of marblers, raw supplies of this stone could be won from a broader area of the outcrop. Medieval workings were once found at Swanage (Peveril Point), and individual pits trailing westward from Oakridge, Wilkswood Farm, Quarr, Downshay, Woodyhyde Farm and Lynch, to Blashenwell Farm near Kingston (Béneult, 2022, 13, Fig. 17). Other workings, of less specific date, have been cited by Arkell at Orchard, Church Knowle and Lulworth (*ibid.*, 134–135).

In his autobiographic account of much later stone-mining, Eric Benfield describes some of the 'quarr houses' of Purbeck, where skilled stonemasons prepared commissioned products. These workshops were sited on a quarry floor or in close vicinity to a mine.

On Wight, the favoured 'Quarr Stone' stratum of the Bembridge Limestone Formation was apparently worked in much the same manner in Norman times. It is interesting to see that the highly localised source of Wight's fine shell-brash limestone was known by the same regional and functional name as on Purbeck. Today, on Wight, the name 'Quarr' is only retained by the abbey.

The style of Wight's early fonts

Writing in 1928, Edmund Tyrrell-Green produced a valuable typological guide to the complexities of England's profusion of baptismal fonts. (Tyrrell-Green, 1928) . This offered a welcome advance from earlier and more eclectic studies by Frederick Paley (1844) and Francis Bond (1908).

The 1928 study encompassed 1,047 fonts in England and a further 124 in Wales. From this, it became clear that most pre-Conquest fonts were of tub-like or cylindrical proportions. In early post-Conquest times, the size of these tubs or cylinders reduced as Norman baptismal ritual favoured simple wetting rather than thorough immersion. In response to this change, the traditional tub form became smaller and was then mounted on a central shaft or pillar. On Wight we find a single example of this in the church of St John the Baptist at Niton (Fig. 4). Fashioned in local sandstone, here, it seems, is the oldest of all of the Island's surviving fonts.



Fig. 4: Wight's earliest font? Niton's sandstone tub font was probably installed before 1071.

As change from Anglo-Saxon immersive baptism progressed, we find Early Norman fonts of round or square form similarly mounted on a central pillar. A further step in this progression is evident when the round or 'cup-like' form is complemented by polygonal variants. Amongst these, the octagonal bowl holds almost total domination. Preference for this form then endured over a long period (Tyrrell-Green, 1928). For the stonemason, these faceted fonts were probably much easier to produce, as



Fig. 5: Ryde's octagonal Purbeck Marble font displays its early lancet panels.



Fig. 6: The Purbeck Marble octagonal font in the church of St Olaf, Gatcombe, IW. (Note the bedding plane crack)



Fig. 7: Thorley's plain octagonal Purbeck Marble font bound by its iron repair.

curvature templates could be set aside. Here, at last, we come to the form of the Purbeck Marble fonts we see on Wight at Ryde, Gatcombe and Thorley (Figs. 5–7).

Tyrrell-Green also notes two rare instances in which Norman square fonts had been converted to



Fig.8: Calbourne's Purbeck Marble font. A square basin subsequently sawn and chiselled to octagonal form



Fig.9: Another face of Calbourne's converted Purbeck Marble font.

octagonal form by the removal of their corners. To his two East Anglian examples at Shepreth and Thetford, we may now add the similar conversion we see in Wight's formerly square font at Calbourne (Figs. 8–9).

For early fonts composed of the hard fossiliferous limestone won from the Purbeck quarries and mines, we may look to a most helpful investigation pursued by Rosemary Leach (1978). From the medieval quarr houses on the Purbeck Limestone outcrop, she traces a nationwide scatter of at least 191 Purbeck Marble fonts (Figs. 10 – 11).

When we view the total distribution of octagonal fonts in Fig.10, it appears that the London industry was probably responsible for the high concentration of arcaded fonts of this kind that were fashioned for recipients along the East Anglian coast. There is a perceptible distinction in many of these East Anglian fonts where the arcaded panels are emphatically Gothic in style. Being narrow and particularly pointed, these, it seems, may characterise some of the London workmanship.

In this current discussion, the overall array of Purbeck fonts may be generally divided into those that are square and those that are 'polygonal' (Leach, 1978). The latter embraces both

octagonal forms (102) and hexagonal ones (5). This list now includes Wight's octagonal fonts at Ryde, Gatcombe and Thorley. On Wight, there are also Purbeck Marble square fonts at Arreton, Calbourne and Freshwater (Figs. 8, 9 & 12–15).

The subsequent study by John Blair (2001) now indicates that some of these were fashioned by a second group of craftsmen using raw marble shipped from Purbeck to royal workshops near the Westminster waterfront in London (Blair, *ibid.*, 45–50). These, it seems, were émigrés from Dorset (Thomas, 1998, 63)

The known medieval output of Purbeck Marble fonts

(after Leach, 1978, with Isle of Wight additions)

Square fonts	93
Octagonal fonts	102
Hexagonal fonts	5
Miscellaneous font fragments	15+ Godshill?

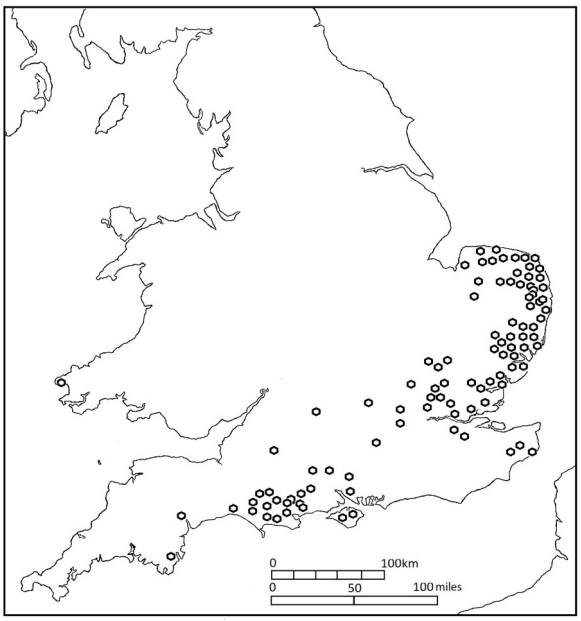

Fig.10: The distribution of octagonal Purbeck Marble fonts. (Adapted after Leach, 1978.)

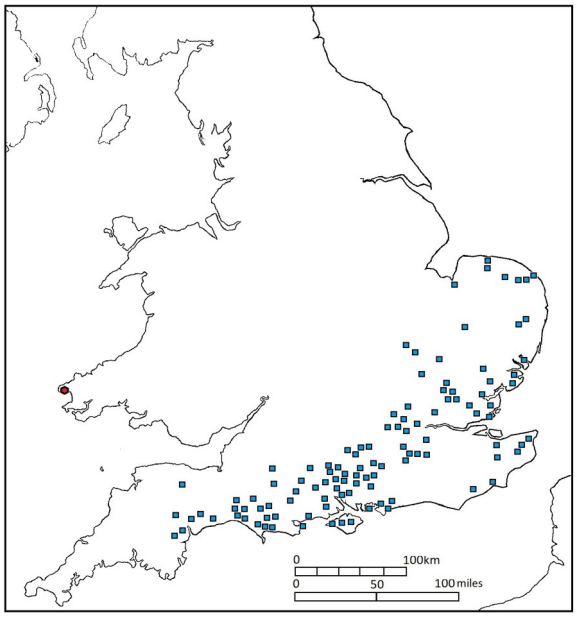

Fig:11: The distribution of square Purbeck Marble fonts. (Adapted after Leach, 1978.)

Wight's surviving fonts of Purbeck Marble

In addition to the three octagonal examples now identified on Wight, further Purbeck Marble fonts bring the Island's total to six. At Arreton and Freshwater, the surviving square fonts are fragmentary. At Calbourne, we have already noted a square example that has suffered crude conversion to octagonal form. There are, moreover, other Purbeck Marble imports that deserve our attention.

At Godshill, some fragments of free-standing Purbeck Marble shafts, recovered in 2022, are



Fig. 12: A significant corner fragment of the original Purbeck Marble font in St George's church, Arreton.



Fig:13: The Victorian replacement font at Arreton displays a round-arched arcade replicating the decoration of Arreton's earliest font.

possibly suited to the supports of a further font. These pieces were found during building groundworks some 70m downhill from the church. Their archaeological context might possibly accord with internal changes inside this church before or during Reformation times (Tomalin & Trott, 2022, 66–70, Figs. 7a, 7b & 8). Godshill's present font appears to be a post-Reformation acquisition.

At Shalfleet, generous use of Purbeck Marble was once made when constructing the piers of the south arcade of the nave (Fig.18). This appears to be an installation of late thirteenth century date (Stone, 1911, 275–276). In the south aisle, two fine grave-slabs of anonymous Norman knights attest to further use of this prestigious Dorset stone.

In the grass near the church porch, a 'drum' of local Bembridge limestone, pierced with a central hole, apparently attests to the discard of the pedestal of Shalfleet's earlier font. Whether, like the nave arcade, the lost font basin was a further Purbeck import to the Island, we are simply left to ponder.



Fig.14: The replacement font bowl and shafts of Freshwater's font are set on the original Purbeck Marble feet.

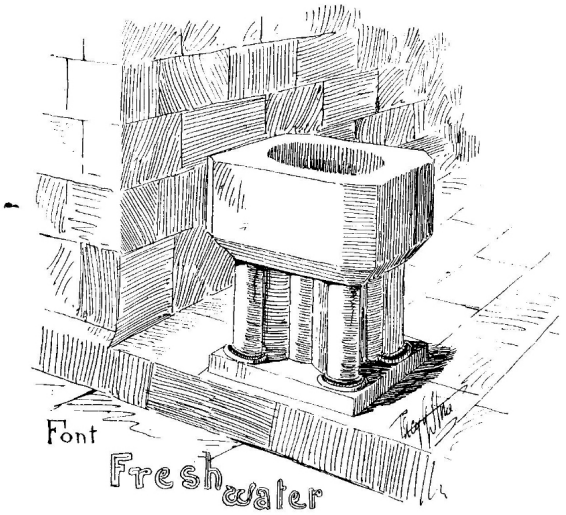

Fig.15: Freshwater's font, sketched by Percy Stone before the replacement of its bowl and shafts in 1875–76.

Dating the Ryde and Gatcombe fonts

The dating of the two virtually identical fonts from Ryde and Gatcombe rests on analogous examples emanating from the Purbeck Limestone outcrop. When the 102 examples were mapped by Rosemary Leach in 1978, these revealed some perceptible distinctions in their scatter across the southern and south-eastern counties (Fig. 10).

In the Hampshire church of Colemore (Leach, 1978, 70) and in the Dorset churches of Loders, East Stour, Hilton, Tarrant Hinton and Tarrant Monkton, we find square fonts of Purbeck Marble each exhibiting shallow, blind, round-headed relief panels. These panels convey the outline of traditional round-centred Norman arches (RCHME, 1952, 1972 & 1975).

In the Dorset churches at Lydlinch and Shapwick, we find that our Purbeck marblers have employed similar Romanesque imagery on some of their octagonal fonts when pairing arched decoration on each face (RCHME, 1970a, 136–137 & pl. 26 (2); RCHME, 1975, 58–59). At Lydlinch, the maker's interest in linking these panels into an arcade is particularly emphatic where a depiction of round-headed arches spills across the corners of the font from one face to another (RCHME, 1970a, *ibid.*).

At Purbeck, we do not have to look too far away to identify appropriate sources of contemporary artistic inspiration. These we find at Christchurch and Winchester, where robust round-headed nave arcades still line these grand church buildings. Here is Romanesque design befitting the tastes of both architect and font-artisan, yet these preferences are unlikely to have outlived the twelfth century.

On most of Purbeck's exported octagonal fonts, we find blind arcaded panels showing peaked arches that conform to Early English style. On a number of these fonts, these panels depict relatively shallow arch tips of the kind we see at Ryde and Gatcombe. Across southern England, however, the panels on these octagonal fonts can often be further narrowed and sharpened in full recognition of the advance of the Gothic Lancet style.

If we accept that the pointed arch did not arrive in England until French design was employed at Canterbury and Westminster in the last quarter of the twelfth century, we are offered a baseline for the stylistic dating of Wight's two arcaded octagonal fonts. When these were fashioned in a Purbeck quarr house, it seems that Gothic influence may have been at a relatively early stage. How might this be imparted?

Just 17km north of Corfe and the Purbeck Marble outcrop, some primary inspiration may have been drawn from the impressive Norman church of Wimborne Minster. Here we find a nave arcade with drum piers composed of imported Caen Stone (DBS, retr. 2025). These robust columns and their early Gothic (Lancet period) arches have all been attributed to a Norman rebuilding phase. This, on stylistic grounds, has been dated to 1170–1190 (DBS, *ibid.*). Here, before the close of the twelfth century, it seems that the advance of lancet arcading into south Dorset may have been facilitated by the shipments of Caen Stone from Normandie (Normandy). As the Gothic arches rose in Wimborne and Christchurch, a 'Transitional' response in the marble pits of Purbeck was surely inevitable.

Back on Wight, the modest lancet panels we see on our two octagonal fonts offer an attractive comparison with the early Gothic arcades we see in our Island churches at Arreton, Brading, Brighstone, Carisbrooke, Freshwater, Northwood and Whitwell. When we are reminded that all of these late twelfth century structural arcades of rotund piers and modest pointed arches are a recognisable Island type (Lloyd & Pevsner, 2006, 19), it appears that something much more than a few random imports was then afoot amongst congregations and benefactors in post-Conquest Wight.

Pursuing the earlier provenance of the Ryde font

When seeking the original home of the Ryde font, there are several possibilities. These have been mapped in Fig. 3.

Ryde is an implanted resort town, a Victorian imposition on the Solent coastline of the mother

parish of Newchurch. The mother church at Newchurch is cited as early 1071 when it was gifted to the monks of the Normandie abbey of Lyra (Stone, 1891, 25; Hockey, 1970, 13–14). This makes the church at Newchurch a potential and appropriate custodian of a Norman font.

Today, a visitor arriving at Newchurch will find a Victorian font holding cuckoo residency within this ancient medieval building. This raises the possibility that, within the boundaries of the old parish, Newchurch's earlier font may have been relegated to the peripheral chapel at Ryde. Unfortunately, no supportive documentation has been traced.

Just 1.6km west of the font's present location is the twelfth century church of Binstead. In Norman times this church had served the stone-working community of Quarr. Some of the ancient stonepits of this parish can be found within 200m of the church. As quarriers, hewers and shippers of stone, the Binstead community and its monastic neighbours in the Cistercian abbey of Quarr were particularly well placed to take possession of high-quality imported Purbeck stonework. Not long after their arrival in 1132, the monks of Quarr were importing Purbeck Marble components for the construction of their abbey church and its attendant claustral buildings. Although a Cistercian abbey would not seek to accommodate a font, its adjacent parochial church at Binstead would certainly have such a need. Here was a ready opportunity for a commissioned Purbeck font to be shipped to Quarr and carted the short distance to Binstead.

In 1846, Binstead church was extensively remodelled. The original chancel arch was then demolished and the nave restructured. Like the arrangement at Newchurch, we now find, in the west end of the nave, a further Neo-Gothic baptismal 'cuckoo' appropriating the place of Binstead's original and absent font. Whatever happened to the earlier font is unknown, yet Ryde's church of St Thomas was only a very short cart-ride away.

A further potential source of the Ryde font might be postulated in the neighbouring parish of Brading. Here, the church of this medieval port/borough still retains some upstanding structure attributed to the late twelfth century (Stone, 1912, 167, plan; Lloyd & Pevsner, 2006, 91–95).

As the focal building within the town, this church was well placed to receive imported Purbeck Marble components shipped in from the Dorset coast. The only evidence we see, however, is a somewhat late Purbeck Marble tomb-slab installed for John Curwen when he was buried in the church in 1441. Inside this church, we find a diminutive octagonal stone font bearing the date 1631. Dates on fonts are very rare, and here we have been lucky enough to find a seventeenth century labelling, simply applied without a mason's chisel. Brading's earlier font displays a robust plain bowl with a scalloped basal bevel of Norman style.

As Puritan zealotry continued to flourish in the first half of the seventeenth century, an ejection of a traditional font could certainly suit contemporary prejudices. For some congregations, nothing larger than a small basin or even a simple cup could then befit the ritual of baptism (Bond, 1908, 277). When the congregation of Lostwithiel ushered a horse into the church and baptised the bewildered beast as 'Charles', we see how strong a call for regnal and liturgical change could be in late Stuart times (Bond, *ibid*.). The unusually small and plain octagonal font in Brading church may be a further product of these post-Reformation changes.



Fig. 16: Brading's font with painted date of 1631 (on left facet).

Seeking a historical context

When dating Wight's octagonal fonts on stylistic grounds, we may consider Rickman's definition of 'Early English' workmanship (1817); this spans 135 years between 1172 to 1307. The simple points that tip the arched panels of the Ryde and Gatcombe fonts seem suited to a relatively early position within such a period. Since Edmund Sharpe (1851) recast Thomas Rickman's 'first Gothic style' by creating a primary 'Lancet Period' covering 1172 to 1245, this latter timespan appears to be more appropriate.

It was during this 'Lancet period' that the Isle of Wight found the lordship of its territory passing through three generations of the Redvers (Reviers) family, who held the earldom of Devon. A search for a triggering point for the importation of prestigious Purbeck fonts into Wight during these unpromising years is unrewarding. At Gatcombe, the foundation of the church has been attributed to the thirteenth century, but a specific date is lacking (Stone, 1891, 35; 1912, 248). The founder of this church is equally elusive, apparently being a member of the de Estur/ L'isle family (Stone, 1912).

At Thorley, possession of the church lay in the hands of Christchurch priory. This church was standing in 1155, when its gifting to Christchurch was confirmed by Adeliz, widow of Baldwin de Redvers (Bearman, 1994, 4, Fig. 1; Hanna, 2007, 6). Given that Thorley's octagonal font is devoid of Gothic decoration of later twelfth century style, it seems possible that this plain font may have been commissioned and provided by Adeliz before her death in *c.* 1160. We know that some substantial Purbeck Marble items were already being shipped out of Dorset well before this time, because her father-in-law, Richard de Vernon (also known as 'de Reviers') had been laid to rest under a tomb cover of this stone when buried in the

Normandie abbey of Montebourg in 1107 (Béneult, 2015 & 2018).

In his review of Purbeck's medieval marble industry, John Blair assigns its principal production to the period 1170–1550. He also suggests that earlier marblers were at work somewhere in the vicinity of the Purbeck village of Corfe. Sited on the vital geological outcrop of the marble facies, it is here that a localised industry evidently flourished in the thirteenth and fourteenth centuries (Thomas, 1998, 63).

John Blair observes that the geographic spread of Purbeck Marble products is well marked by the distribution of fonts. When he attributes these large heavy products to the period 1170 to 1230, it seems that the simpler lancet panels may be virtually the only stylistic guide to the dating of their production.

Unfortunately, there are no inscribed dates or dedications on fonts of this kind; neither, it seems, are there any written commissions for these items. Helpfully, in Normandie, some specific dates confirm early shipment of heavy Purbeck Marble products, but these are not fonts.

Supplementing Richard de Revers' sarcophagus cover of 1107, we find further tomb covers datable to 1141 at Lisieux, and 1168 at Bayeux (Béneult, 2015, table 1). Closer to source, architectural components of Purbeck Marble were installed in Wolvesey Palace, Winchester, around 1141 (Thomas, 2008, 73).

Shipping the Purbeck products

In the approach to Poole Harbour, the seabed of the Swash Channel has now revealed the surprising presence of a thirteenth century 'Mortar Wreck'. Discovered in 2020, here is a lost cargo of Purbeck building stone and Purbeck Marble tomb slabs and mortars, all attesting to shipment in a craft with a dendrochronological date of 1242–1265 (Cousins, 2024).

Here, for the first time, we glimpse a consignment of Purbeck stone and marble exports shipped on a single occasion in a clinker-built craft that was probably in excess of 20m in length.

Now that this new and promising seabed investigation offers specific details of a particular shipment of Purbeck Marble, we might turn to more remote evidence to be found within no more than fifteen kilometres from the Swash Channel wreck. This has been provided by a medieval marbler completing an unusual commission sometime, it seems, in the thirteenth century.

Just some 7km north-west of Corfe, we find, in the Church of Lady St Mary, at Wareham, a substantial Purbeck Marble coffin. Attributed to the thirteenth century, this work resembles a full-round flat-bottomed craft similar in design to a single-masted Dutch tjalk (RCHME, 1970b), Fig. 16). Here, it seems, we may be glimpsing a type of craft well capable of delivering fonts, tombstones and all manner of heavy stone consignments to the havens and landings of Wight, and, indeed, much of the Channel and North Sea coasts.

Lost fonts and replacement fonts

A medieval stone font was essentially a one-off purchase, offering almost inexhaustible use. After a floruit of some sixty years, it is unsurprising that medieval preference for lancet decoration should shift to other designs on fonts. On the Isle of Wight, however, we can ponder a revival. This arrives some six hundred years later when churchwardens and their architects, at Arreton and Freshwater, apparently sent to Purbeck while remodelling their churches and their fonts (Figs. 13 & 14).

At Arreton, the accuracy of the font's replication may ever tantalise us when we examine the scant surviving fragments of the original bowl (Fig. 12). At Freshwater, in 1894, a significant change was made when an original deep octagonal font bowl was replaced by a more elegant shallow, tabular version. The feet of the original remain *in situ*. Fortunately, Percy Stone, the Island's antiquary, had at least been busy sketching the medieval original (Figs. 14 & 15).

At Binstead, Brading, Newchurch, Freshwater and Shalfleet, Wight's medieval fonts are gone, yet Francis Bond, considering England more broadly in 1908, poignantly reminds us that the gardens of the local manor house or vicarage, the cattle trough and even the facilities within a rural public house can all be rewarding places to look.



Fig. 17: Boat-shaped coffin of Purbeck Marble recovered from the churchyard of the Church of Lady St Mary, Wareham. The attributed date is 13th century (RCHME, 1970b).

Acknowledgements

I am most grateful to Dr Mike Cotterill, John Margham, David Marshall, Nicholas Hogben, Grahame Soffe, Tim Wander and the archaeological team members of the Isle of Wight Natural History and Archaeological Society, all of whom have contributed to the evidence gathered and presented in this paper. For editorial patience and guidance, I thank Dr Paul Bingham and Anne Marston who have inevitably improved the final presentation of this paper.

APPENDIX

Summary of Wight's Purbeck Marble fonts

Arreton

Within the Late Anglo-Saxon church of St George. A square (tabular) font of Purbeck Marble has been replaced by a Victorian one of similar form, but not necessarily of similar decoration. A few random fragments of the former font have been collected together in the north aisle of the church. These confirm the presence of a round-headed arcade of shallow relief arches on at least one face (Figs. 12 and 13). This face is convincingly reproduced on the replacement bowl that now displays an arcade of seven arches. Of the other three faces of the font, one displays a row of four quatrefoliate leaves and the second shows a pair of poised squares linked by a horizon bar. The third face exhibits a pair of fish horizontally tiered in opposed directions. Sadly, the surviving font fragments now offer no convincing evidence for this attractive Victorian interpretation we see on these three other faces.

Calbourne

Within the medieval parish church of All Saints, a square font of Purbeck Marble has been converted to octagonal form by drastic sawing, chiselling and removal of its corners (Figs. 8 and 9). The central decorated portions of its four original faces still remain. Reconstruction of these panels is certainly possible. None show evidence of arcaded decoration.

Freshwater

A tabular font of Purbeck Marble was extensively restored by F. L. Pearson in 1894 (Lloyd & Pevsner, 2006, 140). The pristine font bowl and the supporting shafts are apparently his work, while a medieval base offers assurance of authenticity (Fig.14) The font's configuration closely resembles the tabular font at Arreton, but the four blank faces at Freshwater are uncharacteristic of a font of this type. Writing in 1891, Percy Stone sketched the original octagonal font. While it, too, was plain sided, it alternated between wide and narrow faces. The font bowl, moreover, was remarkably deep. Although the shafts have apparently been renewed, the feet were just as we see them now (Fig. 15; Stone, 1891, vol. 2, 34).

Gatcombe

At the west end of the parish church of St Olaf, this octagonal monopod font occupies a traditional position but is now, apparently, redundant. Its eight faces each bear paired identical Lancet-style arches executed in shallow relief (Fig. 6). The curvature and peaking of the configured arches is relatively weak. Damage on the rim has been crudely repaired with concrete and seems attributable to the removal of a formerly hinged wooden cover. This font and its rim damage is virtually identical to the font at Ryde.

Ryde

This font simply comprises a detached octagonal bowl discovered, in October 2022, under the staircase of the Victorian church of St Thomas (Figs.1 and 5). Its presence and its concealment are both difficult to explain. Its style, proportions and its early Lancet decorative panels are all virtually identical to those at Gatcombe. This includes a damaged and detached portion of rim that seemingly marks the removal of a former hinged and anchored cover.

Thorley

Sited close to the manor house at Thorley, a small stone church of 13th century date was demolished, for no good reason, in 1871. Its plain octagonal font, drawn *in situ* by Percy Stone, (Stone, 1891, vol. 2, 61–62) now survives in the Victorian replacement church in Thorley village. Here, it is now held together by a robust iron band (Fig. 7) .

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Author
Professor David Tomalin
Email: davidjtomalin@yahoo.co.uk



Fig. 18: Purbeck Marble capital and 'drum' components in a 13th century nave pier in Shalfleet church.

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CASTLE HILL, MOTTISTONE, ISLE OF WIGHT
A GEOPHYSICAL SURVEY

Dave Staughton and David Marshall

Abstract *As part of a larger archaeological study of the National Trust Mottistone Estate, the Isle of Wight Natural History and Archaeological Society conducted a survey of the scheduled ancient monument known as Castle Hill. A combination of new geophysical data and accurate LiDAR surface data revealed an array of new features. These could not be explained by the natural surface topography or subsurface geology of the site and are now considered to be archaeologically significant. The survey included a study of the wider setting of the earthwork and its possible relationship to an historic landscape. The results of the survey support a case for further investigation to establish the date and purpose of the earthwork.*

Keywords: Archaeology, Isle of Wight, Mottistone, geophysics, LiDAR, Iron Age

INTRODUCTION

Aims and purpose

The Isle of Wight Natural History and Archaeology Society continues to conduct its extensive landscape survey of the Mottistone Estate. The purpose of this survey is to inform and assist the Trust's nature recovery plans. These are now shaping long-term land management prescriptions throughout the estate.

The estate includes the Castle Hill earthwork, a scheduled ancient monument that has already been subject to changing land-use regimes. The non-invasive survey, described here, has sought new geophysical data and LiDAR (LIght Detection And Ranging) data with the purpose of gaining a better understanding of this hilltop monument and its vulnerabilities. The study also considers the wider landscape setting of this hilltop earthwork.

Past evaluations

Past evaluations of the Castle Hill earthwork have ranged from Iron Age to medieval, the former being commonly favoured. The suggested function of the monument has ranged from defended settlement to stock enclosure. Basford (1980) suggests an Iron Age date; in a detailed discussion by Currie (2003), a similar conclusion has been drawn. Unfortunately, there are no contextual artifacts to support any of these proposals. The new geophysical survey has enhanced discussion while still leaving the questions of date and purpose unresolved.

Site Location and Description

The Castle Hill earthwork is located on a high ridge of Upper Greensand in the south-west sector of the Isle of Wight. It is 470 metres north of the village of Mottistone, now in the parish of Brighstone, formerly known as Brixton (Fig.1). Long known as Castle Hill it is a Scheduled Monument (Historic England 1995, SAM 22063; NGR: SZ 4088 8407). The earthwork lies 1.8 kilometres inland on a hilltop offering extensive southerly views over the coastal plain and sea. To the north, it is overlooked by the Island's central range of chalk downs.

Castle Hill earthwork is sub-rectangular in shape and aligned approximately north-south. The internal area of 0.3 hectare, c.55 metres long and c.58 metres wide, is enclosed by a bank c.5 metres wide and c.0.3 metres high. Beyond this is a ditch that is now seen to be c.5.75 metres wide and c.0.5 metres deep. A shallow counterscarp bank is c.10 metres wide and c.0.5 metres high. The earthwork does not appear to survive beyond an historic field boundary on its east side.

Damage and attrition

In a summary of past land-use, Currie (2003) records that the site was planted with conifers by the Forestry Commission circa 1930. Storms in 1987 and 1991 uprooted trees in the plantation, damaging the structure of the earthwork. Further damage was likely caused during the removal of the remaining trees in 1998. Currie estimates the total damage amounts to 50% of the total earthwork.

Although the site has been restored to heathland, it is unprotected. There is ongoing damage from human and animal activity; particularly from free-roaming cattle. Sometime shortly before 1973, a service trench was cut across the site to serve

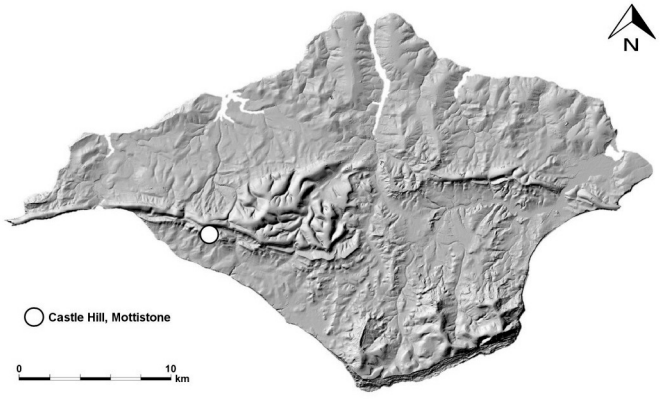

Fig. 1: Location of Castle Hill, Mottistone, Isle of Wight GR SZ409841



Fig. 2: Aerial photograph of Castle Hill – viewed from the north, looking south

Longstone Cottage. The impact of this trench was not recorded. These past and present disturbances to the site, will likely have impacted the imagery of the geophysical data, particularly in the upper soil levels.

Geology and Soils

The solid geology of the site comprises the Cretaceous Sandrock Formation of the Lower Greensand Group (Fig. 3: British Geological Survey, 2013). This, comprises a yellow sandstone interbedded with harder argillaceous rock. Some large ferruginous concretions noted on the site may possibly derive from the degraded bank.

The surface covering of the site comprises a light sandy loam, capped by shallow humus. The loam is derived from a bedrock that transitions into a 'pale yellow sub-soil' (Basford 1999).

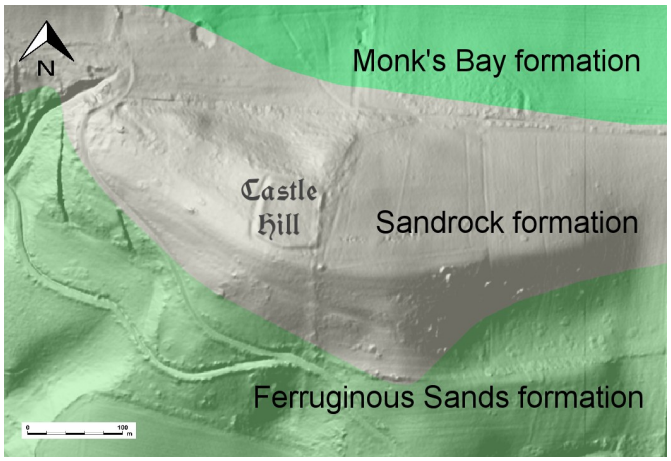

Fig. 3: Bedrock geology around Castle Hill (based on British Geological Survey 2013)

Viewshed

A viewshed is the geographic area visible from a specific location. Fig. 4 shows the viewshed from Castle Hill when observed from its highest point, 143 metres OD. This sweeps a wide arc south from St Catherine's Down (A), in the east, across the coastal plain to West High Down (B), in the west. Further west, a partial view of the Dorset coastline depends upon the prevailing atmospheric visibility. The northern viewshed is limited by the chalkland summit of Mottistone Down. This rises to 201 metres OD at its highest point.

The Neolithic long barrow with its megalithic standing stone (The Longstone) is sited some 200 metres west from Castle Hill. Both lie in convenient proximity to a ponded spring at SZ 40808425 (Figs. 7 & 8). The Longstone is considered to be the location of an Anglo-Saxon 'moot', accessed by an ancient sunken pathway leading from the south (Figs. 7-9; Mills, 2001,72).

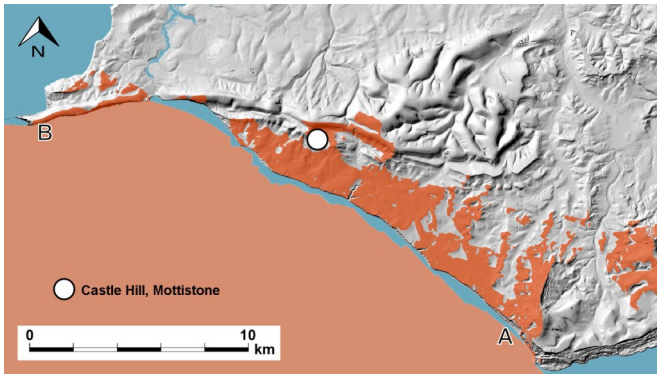

Fig. 4: Viewshed from the southern bank of Castle Hill

Map analysis

The LiDAR model (Fig.10) shows a sub-rectangular enclosure with a complete boundary bank and an external ditch now surviving on all but its eastern side. The eastern boundary is coterminous with an



Fig. 5: Castle Hill location from 1793 OS drawing (OSD 70, British Library) 6 inches:1 mile (not to scale)

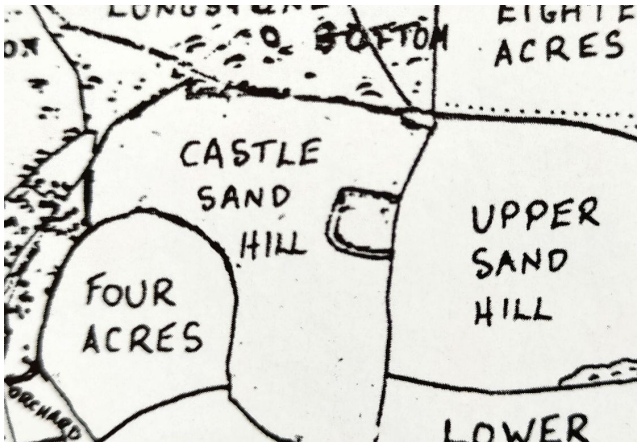

Fig. 6: Castle Hill location with field names, taken from tithe and estate maps of c.1820

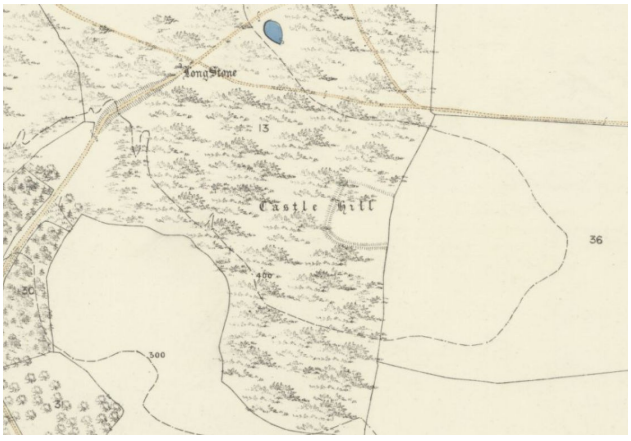

Fig. 7: Castle Hill, The Longstone, and the ponded spring. Shown on the 1862, First Edition of the Ordnance Survey Map drawn at 25 inches to 1 mile

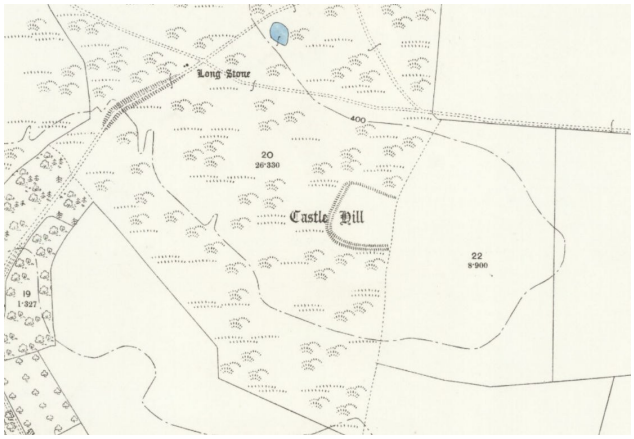

Fig. 8: Castle Hill, taken from Ordnance Survey Map 25 inches to 1 mile of 1898, showing Longstone, pond and hollow way.

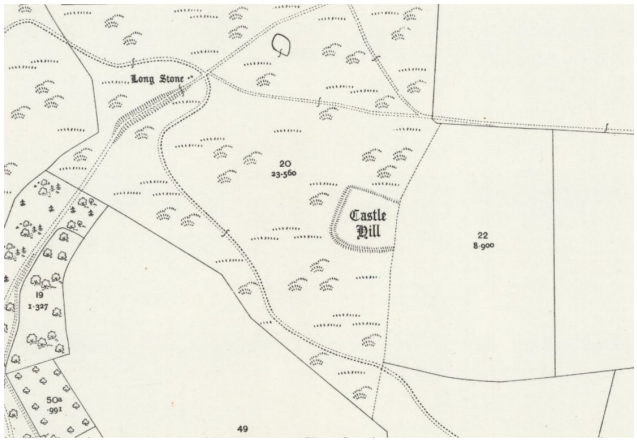

Fig. 9 Castle Hill;, taken from Ordnance Survey map 25 inches to 1 mile of 1908

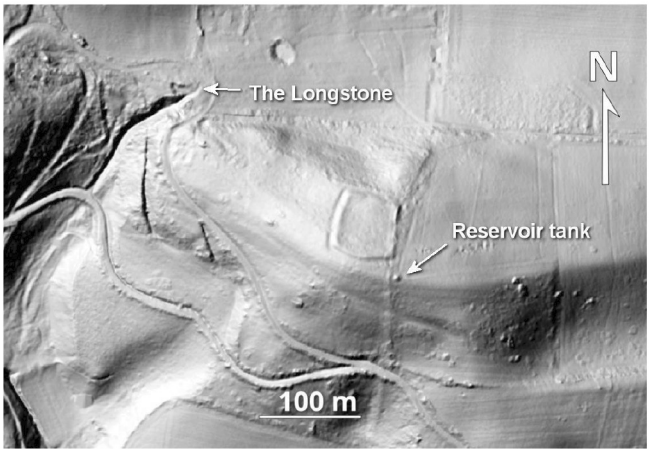

Fig. 10: Castle Hill area 1m LiDAR Digital Terrain Model

historic north-south field boundary. The maps of 1820 to 1862 (Figs. 6 and 7), show a continuous field boundary line along the eastern side, with no bank indicated. This suggests by 1820, the original eastern bank had all but disappeared. On the later two maps of 1898 and 1908 (Figs. 8 and 9), the eastern side is shown by a broken line while elsewhere on the maps field boundaries are shown to be continuous.

All four maps are consistent in the depiction of the eastern boundary as they are with the northern boundary. From the map evidence, the eastern 'bank' shown in Fig.10 appears to be a more recent construction. Unlike the western and southern boundary enclosures, the northern enclosure boundary largely comprises a northern facing slope but no bank to match those on the western and southern sides. It could be the presence of this dip slope made it unnecessary to build a ditch on this side. Alternatively, the ditch may have been naturally in-filled by down-slope soil-creep.

LiDAR

LiDAR data offer a further means of examining this site. Within the area enclosed by the bank and ditch, slope analysis (Fig. 11) shows that this surface slopes towards the north This leaves a relatively level area covering the northern third of the enclosure. Within this area there is a sub-circular feature of approximately 30 metres diameter. This occupies the same central north-south axis as the similar features observed in the geophysical data. This could be the result of more recent activity related to the forestry industry or may have some archaeological significance.

The north boundary beyond the edge of the enclosed area is expressed as a steep slope followed by a levelling, before resuming the steep dip slope into the valley.

The abrupt and very straight change of slope on the east side appears to confirm our suspicion that the original bank and ditch arrangement has been lost to ploughing along the field boundary. Bailey (1985) states 'Farmer no longer ploughs [the] N-E strip about 11m wide next to site, due to large lumps of 'limestone' being pulled up causing damage to plough'. (Note: local geology indicates sandstone not 'limestone'). The ground surface here is further complicated by the works carried out to install the water pipe from the reservoir tank (Fig. 10). It is likely the original alignment of the bank and ditch was a few degrees clockwise, i.e. more parallel to the western boundary.

Immediately to the north-east of the enclosed area there is a levelling of the terrain showing a possible platform which could correspond to an entranceway into the enclosure. The down-slope movement of soil due to ploughing damage to the east bank may offer an alternative explanation for this feature.

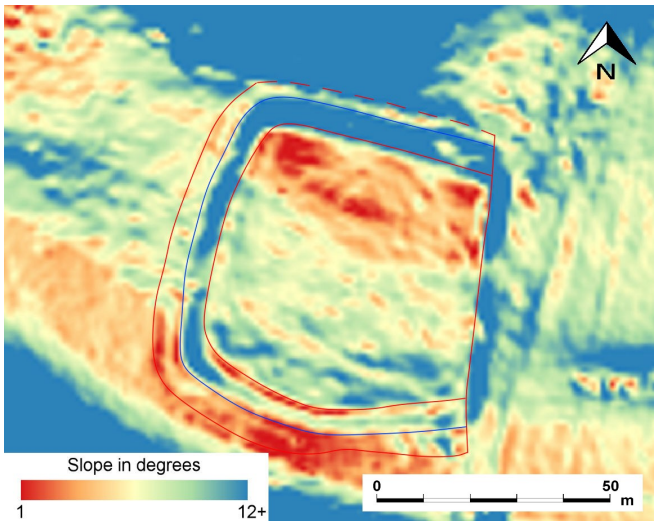

Fig.11: Slope analysis of LiDAR data

GEOPHYSICAL SURVEY

Introduction

The two methods employed in the geophysical survey were Ground Resistance and Magnetic Gradiometry. Both had the potential to reveal a broad range of sub-surface anomalies that could include features of archaeological interest. Distinction has proved to be a challenge where other disturbances had occurred during the history of the site.

In the 1930s the area was planted with conifers by the Forestry Commission. This plantation was well established when, in 1987 and 1991, storms caused major damage, uprooting many mature trees. The resulting damage from these storms, together with the subsequent use of heavy machinery, in 1997/98, for the removal of the trees, will have disturbed the ground within the top metre or so. This damage has likely adversely limited the quality of the geophysical data.

Immediately prior to the survey, the site was covered with brambles and bracken, up to a height of 1m. This was cleared by the National Trust ground maintenance team to allow access for the survey.

The survey grid was planned using the LiDAR terrain data (Fig. 12). A total of 16 grid squares, each 20m by 20m, were positioned to cover the earthwork. Several additional grid squares around the periphery were planned as possible additions, subject to initial results and accessibility.

Methodology

In the field, the grid was positioned using a baseline defined by GPS and calibrated with measuring tapes. Each grid corner was marked with a numbered softwood post that remained in-situ throughout the survey. A GPS location was recorded for each post.

The earth resistance survey was carried out using a Geoscan Research RM15-D Resistance Meter. Data points were acquired at 1m intervals along traverses of 1m spacing across each 20m x 20m grid square (i.e 400 data samples per grid square).

The magnetic gradient survey was carried out using a Bartington Grad601 high-resolution fluxgate gradiometer. Data points were acquired at 0.25m intervals along traverses of 1m spacing across each 20m x 20m grid square (i.e. 1600 data samples per grid square).

Processing of Resistance Data

The earth resistance data (Figures 13 and 14) were processed using Geoplot 4 software. The following steps were applied:

· Edge matching of grids to correct bulk differences due to data acquisition covering several sessions over a number of weeks

· De-spiking to remove anomalous values caused by electrical ground contact issues due to rocks and organic material

· Data interpolation to aid visual interpretation

· Low Pass filtering to reduce local random noise

Processing of Magnetic Data

The magnetic gradiometer data (Fig.15 and 16)

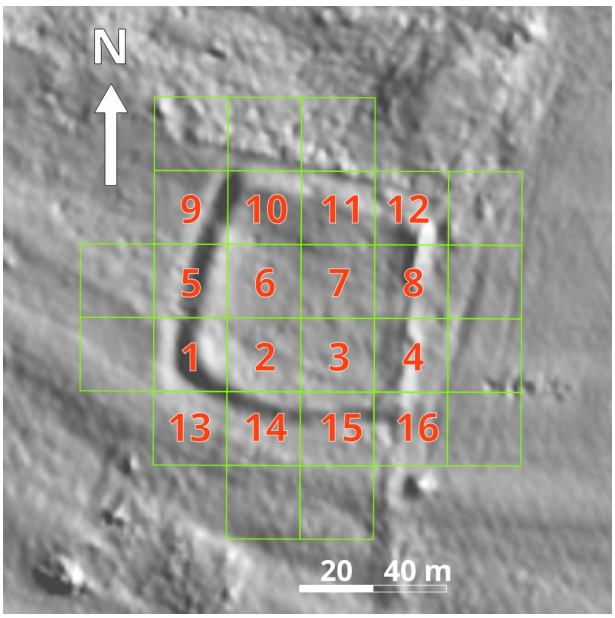

Fig. 12: Survey grid over LiDAR layer

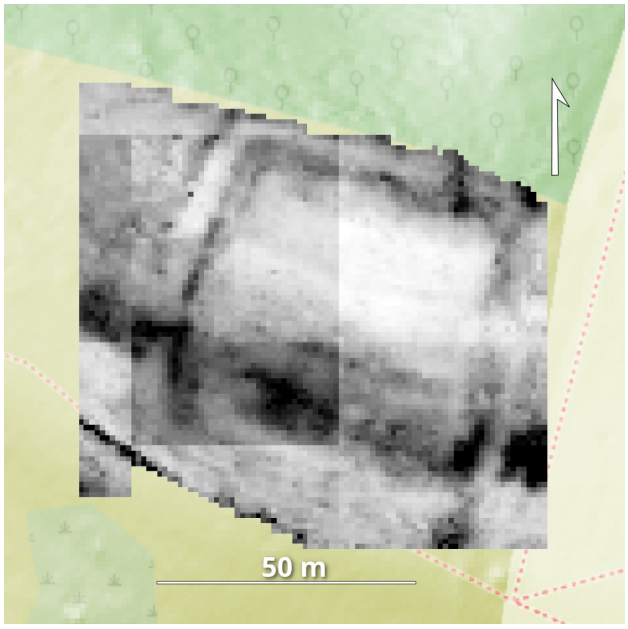

Fig. 13: Raw earth resistance data

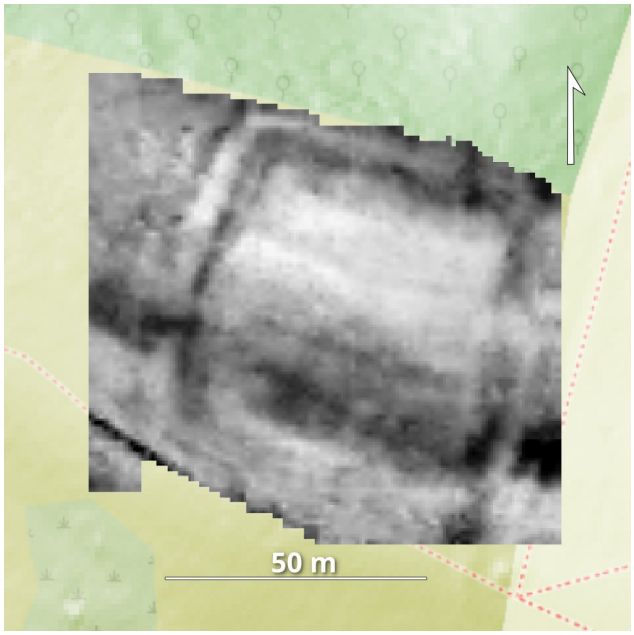

Fig.14: Processed earth resistance data

were processed using Geoplot 4 software. The following steps were applied:

· Data clipping to reduce high magnitude anomalous values from local ferrous objects such as modern debris and buried pipes

· Zero Mean Traverse to remove bulk variations between the magnetic sensors

· De-stagger to compensate for small positional errors caused by traversing rough ground using a zigzag pattern

· De-spike to reduce local anomalous values from soil minerals and farm debris

· Data interpolation to a regular grid to aid visual interpretation

· Low Pass Filtering to reduce local random noise

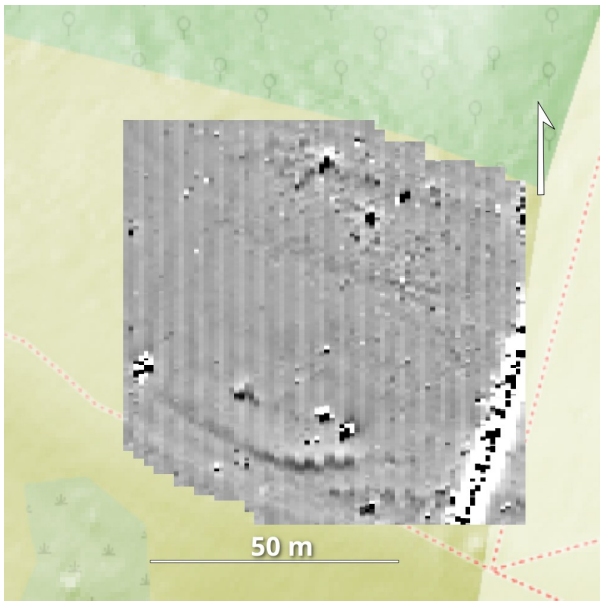

Fig. 15: Raw magnetic gradient data

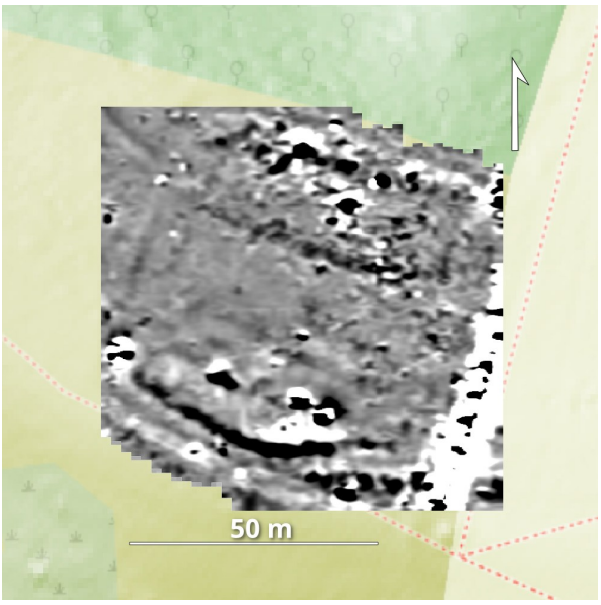

Fig. 16: Processed magnetic gradiometry data

OBSERVATIONS IN THE DATA

Accurate positions of the banks and ditches were plotted from contour and profile analysis of the LiDAR data (Fig. 17). This assisted the recognition of topographical features appearing in the geophysical plots.

The general bedrock geology strike alignment was also plotted to help associate features in the geophysical data with geological effects (Fig. 18).

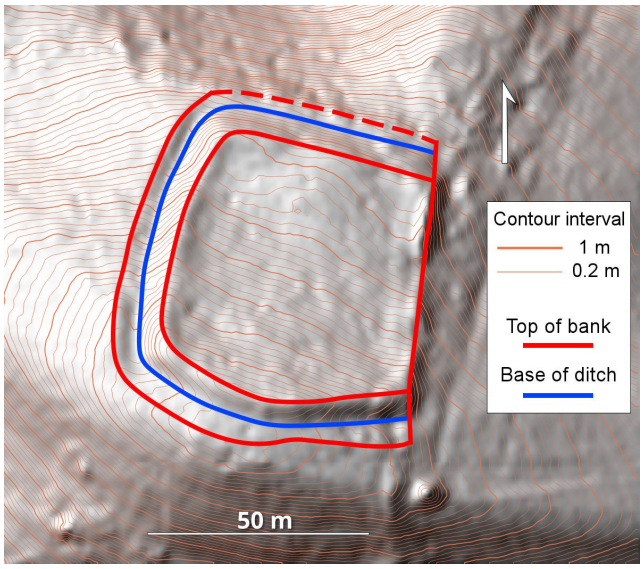

Fig.17: Bank and ditch locations

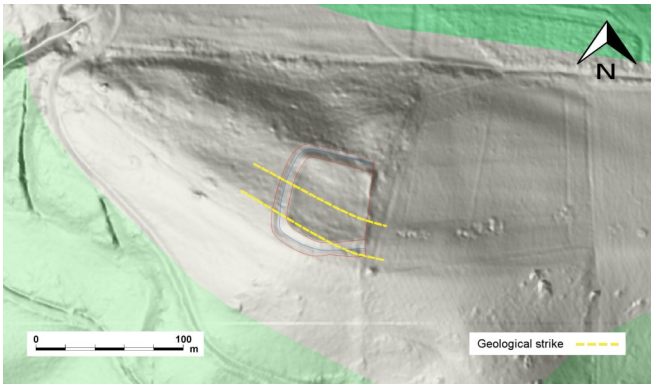

Fig.18: Bedrock geology strike alignment

The earth resistance data (Fig. 19) show alignments with the banks and ditches on the north and west sides. This alignment is less clear on the east side and absent on the south side. There is a very strong linear feature of high resistance on the extreme south-west edge of the survey. There are several linear features of similar orientation, aligned approximately south-east to north-west. The

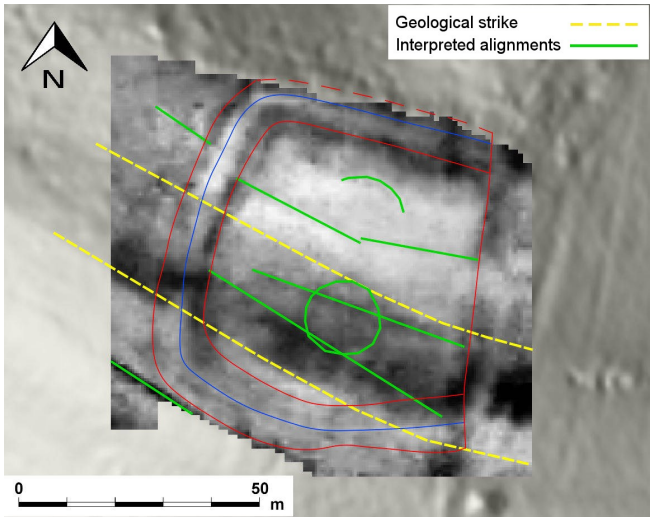

Fig. 19: Resistance data interpretation

southern-most one of these features has an angular offset from the geological orientation. There are two sub circular features aligned approximately to the central north-south axis of the earthwork.

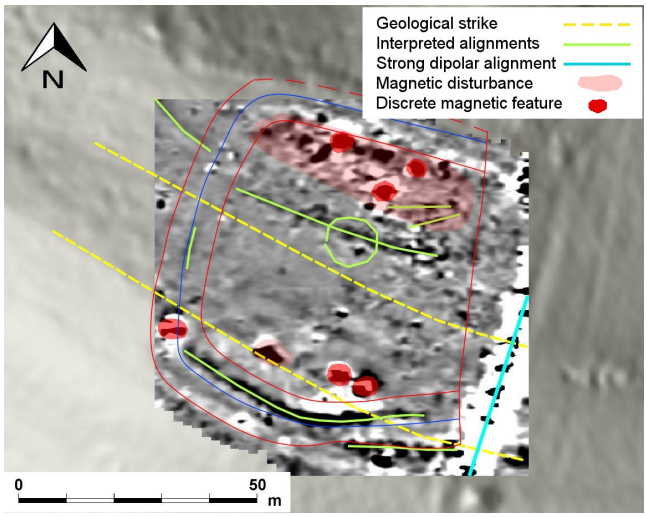

Fig. 20: Magnetic gradiometry interpretation

Most striking on the magnetic gradiometry data (Fig. 20) is the strong dipolar (positive and negative values) linear feature immediately to the east of the earthwork shown in blue. There is one sub circular feature in the northern half of the enclosure aligned with the central north-south axis. Bisecting this is a linear feature aligned approximately east-west. This feature has a possible expression extending further to the west, outside the earthwork boundary. There is a strong linear feature corresponding to the southern ditch and bank. This has a short parallel component in the south-east corner. There is a scatter of positive magnetic discrete features, including three of high value, in the northern third of the earthwork. There are two positive magnetic discrete features in the south, and a further discrete feature within the ditch, which is dipolar in nature.

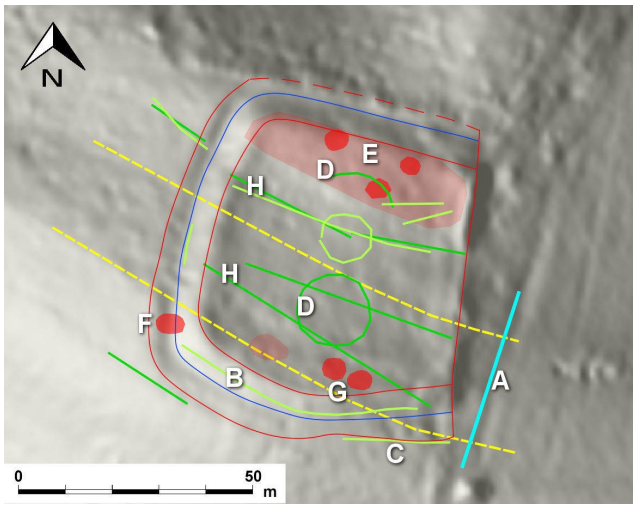

Fig. 21: Combined resistance and magnetic interpretation superimposed on the LiDAR terrain data

DETAILED INTERPRETATION

Fig. 21 combines the interpreted alignments from both the resistance and magnetic data.

The low resistance exhibited in the ditches is likely due to higher moisture content in organic rich soils accumulating through natural down-slope movement. Conversely, the top of the banks exhibit higher resistance likely due to lower moisture content from the natural thinning of these soils.

The very high amplitude dipolar feature to the east (21A) is a buried water pipe connected to the reservoir adjacent to the south-east corner of the earthwork.

There is a strong positive magnetic linear feature corresponding to the southern ditch and bank (21B). The absence of corresponding features for the other three sides may indicate the construction of this ditch involved cutting into the bedrock at the top of the natural ridge. If this feature is the result of cutting into the bedrock, the shorter parallel linear feature in the south-east corner (21C) could represent the construction of a defended entrance.

The weak sub circular features in the resistance data (21D) could be associated with tree-throws although their large size and alignment similarity with the magnetic data suggest they may be of archaeological interest.

The scatter of discrete positive magnetic features in the north of the earthwork (21E) may be due to tree-throws or large iron-rich rocks. Their particular concentration, compared to other areas, may suggest archaeological significance such as pits or burning.

Of the three strong discrete magnetic features in the south, the one in the ditch in the west (21F) is dipolar in nature and is likely to be a ferrous metal object, such as farm machinery debris, etc. The other two similar features further to the east (21G) are predominantly positive and could be thermoremanent in origin and are therefore of archaeological interest. This site has an extensive viewshed to the south over the English Channel which may have been helpful in providing both early warning of danger and the monitoring of seaborne activities such as trade. The use of this site for observation would have been important during the later medieval and post medieval with the navies of other countries intermittently threatening the English shoreline. There were several locations on the Isle of Wight which had beacons. These features in the magnetic data may be evidence of burning resulting from beacons.

The linear features with approximately east-west orientation, expressed in both the resistance and magnetic data (21H), generally align with the geological strike and are most likely natural in origin.

The existence of a trench crossing the site has been previously noted (Bailey 1985) and mentioned by David Tomalin (personal communication). The exact position of such a trench has not been recorded and the purpose of the trench has been variously stated as water pipe, telephone line and land drain. Such dearth of detail does not allow correlation of any one of the features observed in the data with such a trench.

The strong narrow linear high resistance feature on the south-west edge of the survey data (21I) is likely to be a modern service trench. There is a corresponding expression in the LiDAR data of a narrow linear ridge extending 160 metres to the

north-west. Perhaps this is one of the trenches mentioned in the HER record.

CONCLUSIONS

The site occupies a commanding hilltop position with excellent views, but it is also highly exposed to adverse weather conditions. This exposure, coupled with the lack of artefacts, suggests that it is an unlikely location for a pastoral settlement. The banks and ditches alone would not suffice to contain animals without additional structures such as fences or palisades. Constructing such elaborate features would seem unnecessary for a simple stock enclosure. The prominent position, however, might plausibly have served as a lookout or signalling function, potentially associated with an as-yet unidentified nearby settlement.

The geophysical survey data did not reveal strong evidence of habitation. However, combined with the LiDAR digital terrain data, it has been instrumental in creating a more accurate model of the earthwork site. Several features of potential archaeological interest have been identified. Further investigation of these features is necessary to determine their origins and significance.

RECOMMENDATIONS

Despite the improved understanding of the local surface structure of the earthwork and the identification of subsurface features, it is not possible to infer any dates or sequences of activity at the site. The lack of dates and indication of the purpose for the site has a negative impact on its value as a heritage asset.

It is recommended that carefully targeted limited excavation would enable determination of valuable information on dates of occupation and method of construction. This may allow some understanding of the purpose of the earthwork. The following further works are recommended:

· A section trench through intact bank and ditch on the west side. This would provide an understanding of construction technique and allow sampling of material for Optically Stimulated Luminescence (OSL) dating.

· A section trench, sample coring or use of Ground Penetrating Radar to determine if bedrock was upcast to form the south bank and ditch structure.

· A test pit over possible thermoremanent feature(s) in the south.

· A test pit over north 'platform' area to examine linear and subcircular features.

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Authors:

Dave Staughton **email:** dave@staughton.me

David Marshall **email:**marshallleverington@talktalk.net

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LIMPETS (PATELLIDAE) OF THE SOLENT AND ISLE OF WIGHT

Roger J.H. Herbert and Stephen J. Hawkins

Abstract *Limpets* (Patella spp.) *are familiar to all who venture out on to rocky shores. Populations on the Isle of Wight have been a focus of study into their systematics, evolution and as indicators of climate change for nearly a century. Here we briefly review their importance, placing populations in a regional biogeographical context, and present new field survey data for 2024, which we compare with earlier data collected by Crisp & Southward in 1953. Abundance of all larger intertidal species has increased and the warm-adapted species Patella depressa and P. ulyssiponensis have extended their range eastwards to Bembridge, due to rising sea temperatures. For the first time, P. depressa has been recorded on the north shore of the Island. The blue - rayed limpet Patella pellucida appears to be generally widespread along the south coast; however kelp, its favoured food and habitat has reduced in recent years, and this is a cause for concern. Nationally, the Isle of Wight is an important monitoring station for seashore fauna and flora due to the existence of long-term population data and its central location in the English Channel, which is of biogeographical significance.*

Keywords: Climate Change, English Channel, Marine Ecology, *Patella vulgata, Patella depressa, Patella ulyssiponensis, Patella pellucida*

Introduction

Limpets are amongst the best-known animals inhabiting rocky shores, piers and breakwaters and other hard substrata. Around the Isle of Wight and on the mainland Solent shores, they may be found in all suitable intertidal habitats. Limpets are gastropod molluscs that belong to the Order Patellogastropoda, which is currently split in to three superfamilies of 'true limpets', Eoacmaeoidea, Lottioidea and Patelloidea (Nakano & Ozaawa, 2007). Here we are concerned only with the single family of the Patelloidea, the Patellidae. Within the Patellidae there are four *Patella* species in the British Isles and Ireland, all of which are native to the north-east Atlantic. Three are restricted to intertidal habitats (Fig. 1): the Common limpet *Patella vulgata*, L. is a 'northern' cold-adapted species with a range extending from the Algarve, Portugal northwards to the Arctic Circle in Norway (Bowman & Lewis, 1977); the Black-footed limpet *Patella depressa* Pennant (formerly called *P. intermedia* Murray) is a southern 'warm-adapted' species and occurs on Atlantic shores from the Senegalese coast northwards to Anglesey (Oróstica *et al*. 2021; Southward *et al*. 1995); the China or Rough limpet *Patella ulyssiponensis* Gmelin (formerly called *P. aspera* Roding, a name now reserved for its sister species in the Atlantic Islands which have been shown to be genetically distinct, Weber & Hawkins, 2005) is also a southern warm-adapted species, yet has a broader distribution extending from the Atlantic coast of North Africa and the Mediterranean to southern Norway, although is currently absent in the North Sea south of the Humber (Southward *et al*. 1995). The smaller Blue-rayed limpet, *Patella pellucida* L. is one of the most attractive marine snails and may be seen at low tide on fronds, stipes and holdfasts of kelp, serrated wrack and other weeds, and yet its distribution may also extend sub-tidally to around 30m. The species occurs from Iceland to Portugal, but is absent in the southern North Sea (Hayward & Ryland, 1995).



Fig. 1: Trio of *Patella* spp. on the chalk reef near Mean Low Water at Freshwater Bay, 3rd March 2025.

Above left:
Patella vulgata

Above right:
Patella depressa

Bottom:
Patella ulyssiponensis, typically covered in red algae.



Fig. 2: *Patella depressa* leaving its home scar. Castle Haven 13th November 2024.



Fig. 3: Clumps of *P. vulgata* on the edge of concrete slipway (east side) at Castle Haven. 30th November 2024.



Fig. 4: Clump of *P. vulgata* on south side of concrete groyne at Shanklin, 14th November 2024. Note that grazing activity has removed barnacles by 'bulldozing'.

All *Patella* spp. are important grazing animals and have a tongue-like radula that scrapes either the microbial film and detritus from the rock surface or young algal sporelings and germlings (Hawkins *et al*. 1989; Hill & Hawkins, 1991) as well as larger algae (Jones, 1948; Notman *et al*. 2016). In the case of *P. pellucida*, the younger limpets feed on epiphytes on the fronds or stipes of larger seaweeds as well as the seaweeds themselves, with older individuals migrating into the holdfast on which they feed (Little *et al*. 2009; Hereward *et al*. 2018). The larger seashore limpets have dome-shaped or conical shells that accommodate a powerful muscular foot. This enables these animals to clamp firmly on to rocks to minimise the risk of desiccation and to resist dislodgement by waves and predators such as crabs, birds, rats and fish (Thompson *et al*. 2000; Silva *et al*. 2008).

Over time, adults returning from grazing excursions to precisely the same location create a depression on the rock surface known as a 'home scar' forming a seal (Fig. 2). They are supremely adapted to withstand dislodgement by oncoming waves during storms, and are found on both sheltered and the most wave-exposed coasts (Hawkins & Jones, 1992; Little *et al*. 2009). On rocky shores and other hard substrata, the larger seashore limpets *P. vulgata, P. depressa* and *P. ulyssiponensis* are very important ecologically as their grazing activity will often determine the amount of space within an algal canopy into which other species might colonise and occupy. For this reason, although definitions vary, they are often referred to as a 'keystone species' as they are so influential in shaping the diversity and structure of algal and faunal assemblages, particularly on moderately wave-exposed shores (Hawkins, 1981a,b; Hawkins & Hartnoll, 1983; Hawkins & Jones, 1992; Jenkins *et al*. 2005; Coleman *et al*. 2006; Jonsson *et al*. 2006).

Patella species release male and female gametes into the water column, where there is external fertilisation and the development of a planktonic trochophore. Metamorphosis continues with the development of a veliger larva followed by settlement onto hard substrata usually in a pool or damp place. Growth rate is highly variable and dependent on local environmental conditions, including food availability, fucoid cover and species density (Lewis & Bowman, 1975). Where limpet density is greatest, individuals can be smaller due to competition (Boaventura *et al*. 2003; Orostica *et al*.





Fig. 5:
Left: Dog-whelk *Nucella lapillus* predating large *P. vulgata* at Castle Haven 13th November 2024. Note the damp halo surrounding the limpet which is indicative of water loss due to poor foot adhesion, as the animal has succumbed to the dog-whelk's secreted digestive enzymes.
Right: Removal of dog-whelk revealed a drilled hole in the shell.

2020). The largest *P. vulgata* limpets seen on the Island have been in the middle of a canopy of dense knotted wrack *Ascophyllum nodosum* on the vertical sea wall at Bouldnor near Yarmouth (Shell Height 52mm, Shell Length 74mm). Limpets can be solitary or found in groups or 'clumps' (Figs. 3, 4). The cause of these aggregations is unclear, but they may modify the local microclimate to aid water retention at low tide, or resist dislodgement by waves or avian predators, such as oystercatchers (Coleman *et al*. 1999). *Patella vulgata* aggregates under fucoid clumps, whilst *Patella depressa* does not (Moore *et al*. 2011); when clumps were experimentally removed *Patella vulgata* either died, moved to another *Fucus* clump or aggregated with other limpets on open rock.

Individuals may be eaten by crabs and fish; dog-whelks (*Nucella lapillus*) will drill into their shells with their radula, secrete a digestive enzyme and insert their feeding proboscis (Fig. 5). Numerous limpet shells (mostly *P. vulgata*) have been found in Neolithic and Bronze Age middens on the Isle of Wight and elsewhere, suggesting that the animals were harvested and been common in the diet of early coastal human populations (Preece, 1986, 1993; Thomas & Maninno, 1998).

The vertical distribution of the three species around the Isle of Wight differs. *P. vulgata* is found between Mean High Water Springs and Mean Low Water Springs; *P. depressa* occurs from about Mean Neap level to Mean Low Water Neaps. The China limpet *P. ulyssiponensis* is generally found lower on the shore from Mean Low Water Neap Tide mark to Low Water Spring Tide level, as well as in mid-shore rock-pools All are found on exposed and moderately exposed coasts, but only *P. vulgata* extends on to very sheltered shores and the wharves and pilings at the mouth of estuaries and in harbours.

This review will mainly focus on the larger 'seashore' species of *Patella* spp. around the Isle of Wight and update local distribution following survey work in the autumn of 2024. For completeness, a brief update on the status of *P.pellucida* is also included. Results are placed in the context of the regional biogeography on the south coast of England and around the British Isles.

History and Biogeography

In *A Guide to the Natural History of the Isle of Wight* (Morey, 1909) only *P. vulgata* and *P. pellucida* (as *Helcion pellucida*) are noted, when they both appear to have been widespread. Sea temperature in the early years of the 20th Century was generally cold, so it would not be surprising if the other warm-temperate *Patella* spp. were absent or rare during this period. However, limpet taxonomy was in a considerable state of flux in the early 1900s with what became recognized as different species being considered as varieties of *P.vulgata*. Other limpet species remained unrecorded on the Island until the French biologist Edouard Fischer-Piette sampled common animals and seaweeds at St Catherine's Point (Watershoot Bay) in September 1932, and at Culver Cliff and Freshwater Bay in March 1934 (Fischer-Piette, 1936). These sites were included in a regional study of common intertidal animals on both sides of the Channel that established evidence for a biogeographic boundary roughly between the Isle of Wight and the Contentin Peninsula. During this work he observed 'intermediate' forms of *P. vulgata* and *P. depressa*, that he referred to as *Patella intermedia*. However, he later accepted that he had mistakenly named *P. depressa* as *P. aspera* (now known as *P. ulyssiponensis*), (Fischer-Piette, 1938 p268, 1941 p3), so the early records are confusing and there are no useful measures of abundance. However, in the 1930s and 1940s he continued to be interested in the 'intermediate 'or 'transitional' populations of *Patella* spp. from the Island, even claiming that some individuals had 'facies' of the Mediterranean species *Patella caerulea*.

Referring to the work of Fischer-Piette, Julian Huxley, evolutionary biologist, conservationist and grandson of T. H. Huxley, suggested that it was impossible to say whether the divergence of *Patella* on parts of the south-coast represented either a primary step towards complete species separation or was secondary resulting from the hybridisation of three previously differentiated types (Huxley, 1942). In either case it is difficult to imagine how speciation might occur as the region is not geographically or ecologically isolated. In the late 1940s, the biologist Ronald Evans followed up these earlier observations and also found intermediate types of shell lining and pluricuspid teeth on the radula as one worked east in the Channel towards the Isle of Wight (Evans, 1953).

Both Fischer-Piette and Evans regarded populations in the vicinity of the Isle of Wight as areas of emergence of species from a more primitive ancestral stock, yet the possibility of hybridisation could not be overlooked (Fretter & Graham, 1962 p496-498).

In laboratory experiments at Southampton University, PhD student Deborah Hatch found some evidence for species hybridisation (Hatch, 1977). However, using immunological methods and electrophoresis it was impossible to distinguish between the blood sera of *P. vulgata* from that of 'transitional forms'. It was therefore concluded that the 'transitional forms' were variable *P. vulgata* and that hybridisation in the region was minimal. Yet in a comparison of mainly internal shell characteristics of populations at Freshwater Bay and Alum Bay, with Swanage and Portland Bill, she estimated that misidentification of *P. vulgata* and *P. depressa* and *vice versa* was higher at the Isle of Wight localities; at Freshwater Bay this was 6-15%. (n=200 specimens). Subsequent molecular investigations in the Channel and elsewhere have found no evidence for hybridisation of *Patella* spp. (Gaffney, 1980; Sá-Pinto *et al*. 2005).

A more thorough investigation of Channel intertidal biogeography was carried out by Alan Southward (Plymouth Laboratory) and Dennis Crisp (Menai Bridge Marine Biology Station) who sampled shores on the Isle of Wight in July 1953 (Crisp & Southward, 1958). They too established evidence for a discontinuity in the mid-Channel between northern 'Boreal' cold adapted species in the east and warm-adapted 'Lusitanian' species in the west.

At that time, *P. vulgata* was ubiquitous on intertidal hard substrata along both sides of the Channel, yet on the English coast, *P. depressa* and *P. ulyssiponensis* did not extend eastwards of the Isle of Wight or in the southern North Sea, confirming observations of Fischer-Piette (1936) and Evans (1953). On the French coast, a similar discontinuity occurred on the Contentin Peninsula, with eastern limits of both species around or near Barfleur.

The next flurry of activity centred around the effect of the exceptionally severe winter 1962-63 on marine life around the British Isles, including the Channel. Alan Southward had visited shores on the Island in May 1960 and again reported in his notebooks on the abundance of common species as he had done in 1953. Compared to the early years of the decade, sea temperatures in the mid-late 1950s had been relatively warm. He found *P. vulgata* to be 'Abundant' at all sites and recorded the proportion of *P. depressa* in the mid-tidal region at St. Catherine's Point and Woody Bay as 6% of all limpets, and 8% on the shore east of Ventnor. He reported *P. ulyssiponensis* to be between 1-6% of limpets at low water at shores along the Undercliff and 10% at Bembridge. However, in the spring following the icy winter, although *P. vulgata* was widely present, both *P. depressa* and *P. ulyssiponensis* were absent and/or not found (Alan Southward notebooks; Crisp, 1964). Writing in these *Proceedings* for 1967, local conchologist Leslie Prebble observed, '*..the large flat limpet Patella depressa, which before 1963 could be found in reasonable numbers at Hanover Point, Brook, and the eastern side of Ventnor, now seem to have completely vanished* (Prebble, 1968). Almost certainly Prebble was referring to *P. ulyssiponensis,* as *P. depressa* is not a 'large' limpet and has been incorrectly labelled in his shell reference collection (Killeen, 1994). However, *P. depressa* was used as a synonym of what was then *P.aspera* and now considered *P. ulyssiponensis* up to the 1930s.

Between 1963 and 1975, Alan Southward made a further four visits to the Island to monitor the recovery of populations of limpets and other intertidal species, by which time mean annual temperatures were falling as the North-Atlantic entered another cool phase. Yet by the late 1960s and early 1970s there had been a recovery of both species at most of their former sites, with *P. ulyssiponensis* and *P. depressa* reported as 'Common' at Freshwater Bay. One of us (S.J.H) continued the time series with occasional visits to the Island from the 1980s (Kendall *et al*. 2004) to the present, joined by others (including R.J.H.H) in the 1990s as part of the Maine Biodiversity and Climate Change (MarClim) project based at the Marine Biological Association in Plymouth (Mieszkowska *et al*. 2005).

The geographical limits of warm-temperate species set in the mid-Channel around the Isle of Wight, remained broadly similar until the 2000s, when increases in abundance and range shifts were first observed.

Methods

Monitoring effort of populations of seashore organisms around the British Isles has increased, largely as a result of the MarClim project. Following the same general protocol followed by Crisp & Southward (1958), surveys are carried out for a suite of intertidal 'climate indicators' – mostly species that are 'northern' and 'southern' in European distribution, but also some 'intermediate' and non-native taxa. One of us (S.J.H) overlapped with Dennis Crisp and Alan Southward and was able to undertake cross-calibration of field methods on the shore for consistency and to maintain accuracy of the time-series, and co-workers have also followed this protocol.



Fig. 6: 'Limpet ledge' on the chalk reefs of Freshwater Bay, viewing east along the south-west coast of the Isle of Wight to St. Catherine's Point.

Survey Sites

For comparative purposes, survey sites follow those sampled by Crisp & Southward (1958) and subsequently by Alan Southward and others. The majority of sites are on the south coast of the Island where there is a variety of rocky intertidal habitat. There are wave-exposed chalk platforms and boulders at Freshwater Bay (Fig. 6), sandstone boulders along the Undercliff between Watershoot Bay and Ventnor and moderately exposed flat limestone reefs at Bembridge and Colwell. The exact location of Crisp and Southwards sites at St. Catherine's Point and Blackgang is questionable. It is known that they camped at Castle Haven (A. J. Southward personal communication), near the existing caravan park, so it is likely that they went on the shore below the cliff or eastwards in to Reeth Bay, which is mentioned in his notebook for 1960. Fischer-Piette (1936, p189) surveyed the eastern end of Watershoot Bay and it is possible that this site is what is referred to as 'Blackgang' by Crisp and Southward, as the shore further to the west beyond Rocken End is difficult to access and consists mostly of shingle and pea gravel. Piers at Ryde, Sandown and Shanklin were sampled by Crisp and Southward (1958), but Shanklin Pier collapsed in the Great Storm of October 1987, so the large concrete



Fig. 7: Prof. Steve Hawkins sampling *Patella* spp. on the east side of Watershoot Bay in October 2024.

Table 1. Limpet Abundance scale from Crisp & Southward (1958) and used in this study.

Abundant (A)	Over 50 per m^2 or more than 50% of limpets at certain levels
Common (C)	10-50 per m^2, 10-50% of limpets at certain levels
Frequent (F)	1-10 per m^2, 1-10% of limpets at certain levels
Occasional (O)	Less than 1 per m^2 on average, less than 1% of limpets
Rare (R)	Only one or two found in 30 min searching
Not Seen (N)	Not seen in 30 min searching

groyne immediately east of this location and the sandstone shore at Horse Ledge were also examined. The ledges at Bembridge are extensive and limpet density is very variable, yet the highest densities are found on the reef edges where there are grazing enclaves and a narrow limpet-barnacle zone. Previously, higher densities of *P. ulyssiponensis* have been found on the outer ledges, than further inshore at Lane End, which Crisp and Southward refer to, so data from both areas was collected.

Field survey

There is no published information on sample or quadrat size attached to the earlier surveys from 1950s-1970s, but Southward generally used 0.5 x 0.5 m quadrats (S.J.H worked with him in the field).

Following the new MarClim protocol, ten 50 cm x 50 cm gridded quadrats (Fig. 7) were placed at around Mean Tide Level (MTL) avoiding areas with greater than 5% fucoid cover, for *P. vulgata* and *P. depressa*, or wherever *P. depressa* is most abundant. On some shores this can vary between High Water Neap Tide level (HWNT) and Low Water Neap Tide level (LWNT). Additional data collected included rock aspect, angle, barnacle cover and fucoid (large brown algae) cover. The larger *P. ulyssiponensis* is normally found below LWNT mark, and often in rock pools with coralline algae such as *Lithothamnion* spp. Abundance was measured by placement of quadrats or by field classification using the Abundance Scale (Table 1).

Species identification

As previously discussed, the shell morphology of *Patella* species is notoriously variable. With experience, reliable and consistent identification is possible from external characteristics, however it is sometimes necessary to lift a shell to check the colour of the foot and the pallial tentacles (Figs. 8, 9, 10). This is particularly the case in separating some *P. vulgata* and *P. depressa*; several specimens of *P. vulgata* from the sea wall at Cowes Parade that had external characteristics very similar to *P. depressa,* had us both fooled! However, from our experience we consider that for each species, misidentification based on external shell characteristics is about the

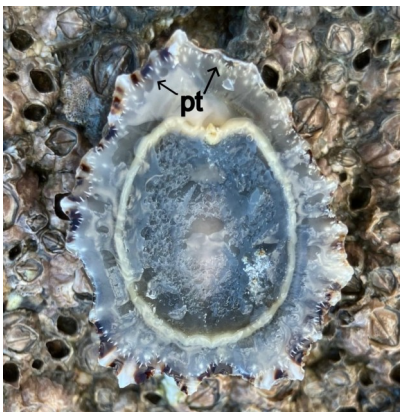



Fig. 8: *Patella depressa*. **Above** Ventral view, showing characteristic black foot and chalky-white pallial tentacles (pt). Concrete groyne at Shanklin 14th November 2024. Mouth at top of photo. **Below:** pale-footed specimen on stone support at Ryde Pier 12th November 2024.



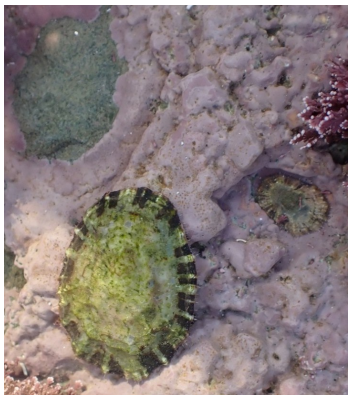

Fig. 9: *Patella ulyssiponensis*, **Above:** Ventral view, showing bright orange foot and white-cream pallial tentacles. Mouth at top of photo. Freshwater Bay 28th February 2025. **Below:** Juvenile and adult *P. ulyssiponensis* grazing in a coralline pool at Watershoot Bay, 17th October 2024.





Fig.10: *Patella vulgata* **Above:** Ventral view with yellow-green foot. Mouth at top of photo. Bembridge, 20th February 2025. **Below:** Green algae on the shell tops of *P. vulgata*, where it cannot readily be grazed off! Grantham Rocks, Cowes, 21st August 2024.

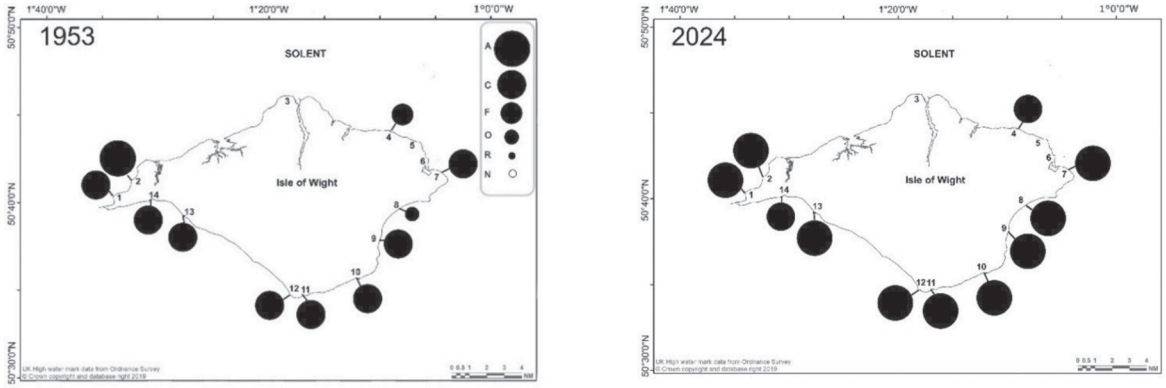

Fig. 11: Distribution of *P. vulgata* in 1953 (Crisp & Southward, 1958) and in 2024. See left map and Table 1 for Abundance scale.

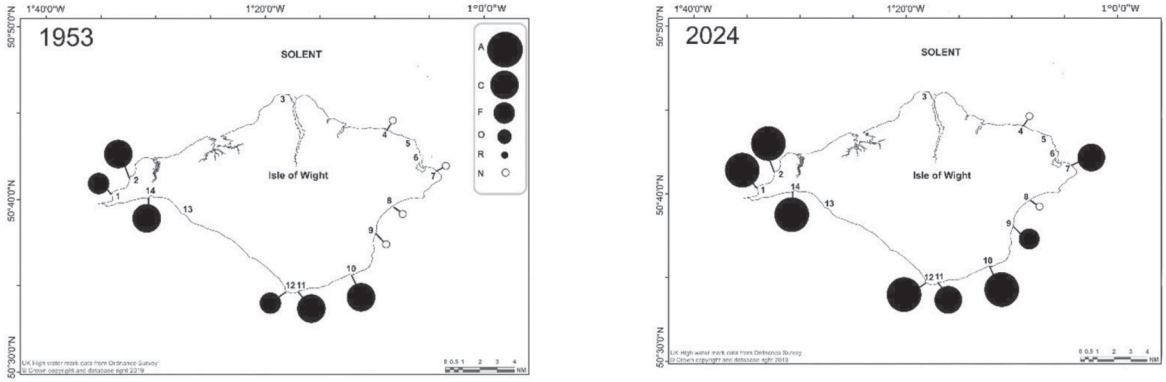

Fig. 12: Distribution of *P. ulyssiponensis* in 1953 (Crisp & Southward, 1958) and in 2024. See left map and Table 1 for Abundance scale.

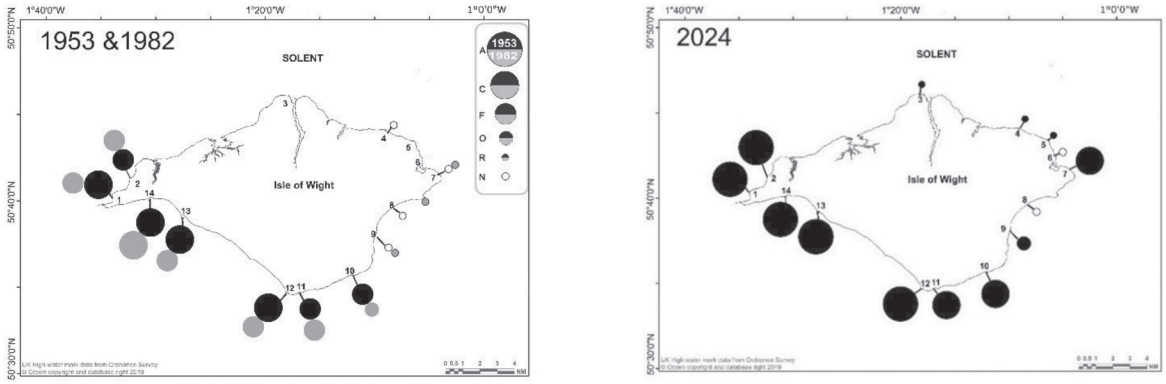

Fig.13: Left: Distribution of *P. depressa* in 1953 (black circles) (Crisp & Southward, 1958), 1982 (grey circles) (data from map in Kendall *et al*. 2004). **Right:** Distribution in 2024; see left map and Table 1 for Abundance scale.

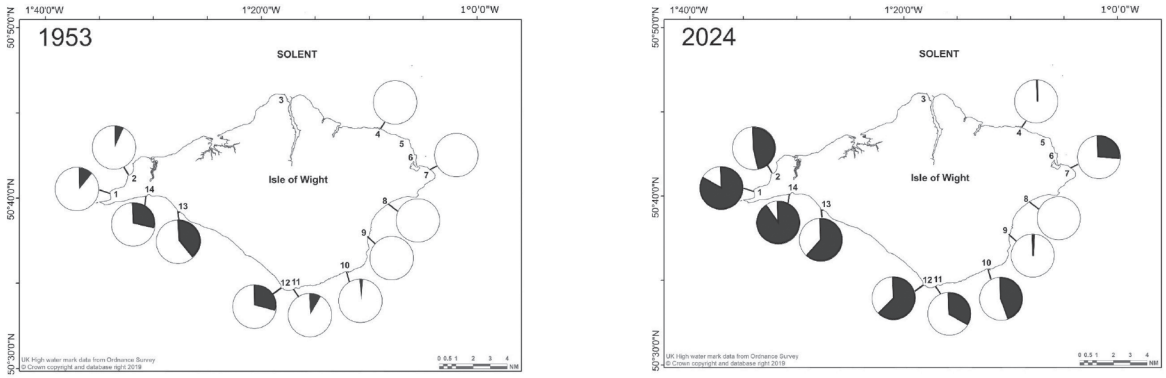

Fig. 14: Proportion of *P. depressa* (black segments) of total limpet population (the rest were *P. vulgata*) where the species was most abundant, normally between Mean Tide Level and Low Water Neap Tide level. Data for 1953 from Crisp & Southward (1958).

Survey sites for each map are 1: Alum Bay (Hatherwood Pt.); 2: Colwell Bay (Warden Ledge); 3: Cowes Parade and Royal Yacht Squadron; 4. Ryde Pier; 5. Seaview; 6. St Helens Ledge; 7. Bembridge; 8. Sandown Pier; 9; Shanklin; 10. Ventnor; 11. Castle Haven; 12. Watershoot Bay; 13. Brook (Hanover Pt.), 14. Freshwater Bay (W.)

Table 2. Summary of abundance from surveys in 2024. Mean density and Standard Deviation (SD) calculated from counts (all limpet sizes) in 0.5 m x 0.5 m quadrats. See Table 1 for Abundance Scale category given for *P. ulyssiponensis*. The % column refers to percentage of *P. vulgata* and *P. depressa* in the mid-shore community.

Shore type and substrata categories based on Crisp & Southward (C&S) (1958). Key: R, rocks other than chalk; C, chalk; B, Boulders (over 10 cm diameter); G, Gravel 10 cm to 2 mm diameter); S, sand (2mm-0.02mm diameter); P, piers, groynes and sea walls and other structures; F, Flat rocks (limestone and sandstone reefs); I, broken surfaces, all angles.

					Patella vulgata		***Patella depressa***		***P. ulyssiponensis***
Sites	**Position**	**Shore Type**	**Date**	**No. Quadrats**	**Mean per m² (SD)**	**%**	**Mean per m² (SD)**	**%**	**C&S**
Colwell Bay (Warden Ledge)	50.68892° N; 1.54147°W	R, I, B	15.11.24	10	110.4 (45.5)	52	100 (38.8)	47	C
Alum Bay (Hatherwood Pt.)	50.67221° N; 1.57007°W	R, I, S	02.11.24	10	64.8 (21.6)	16	344 (169.4)	84	A
Freshwater Bay (West)	50.66843° N; 1.51317°W	C, I, B	18.10.24	10	22.0 (10.4)	9	226.4 (51.2)	91	A
Brook (Hanover Pt.)	50.65160° N; 1.46469°W	R, F, S	18.10.24	10	96.4 (26.8)	38	158.0 (42.9)	62	A
Watershoot Bay (East)	50.57607° N; 1.30432°W	R, I, G	17.10.24	10	87.6 (27.9)	36	150.8 (26.5)	63	A
Castle Haven	50.57702° N; 1.28684°W	R, B	30.11.24	10	64 (30.3)	34	32.8 (16.0)	63	C
Ventnor (La Falaise)	50.59187° N; 1.21190°W	R, B	15.10.24	10	56.4 (17.8)	56	45.2 (12.2)	44	A
Shanklin groyne	50.62976° N; 1.17083°W	P, S	14.11.24	10	111.6 (33.3)	99	<1	0.4	F
Shanklin Horse Ledge	50.61867° N; 1.17196°W	R, F, I, B	14.11.24	10	152.0 (42.0)	98	2.8 (2.7)	2	F
Sandown Pier	50.65250° N; 1.15492°W	P, S	12.11.24	10	74.4 (18.2)	100	0	0	N
Bembridge, Outer Ledges	50.68460° N; 1.06464°W	R, F, S, P	16.01.24	10	26.4 (10.7)	73	10 (5.1)	27	C
Bembridge, Lane End	50.68716° N; 1.06849°W	R, F	20.02.25	10	79.6 (5.8)	100	0	0	C
St. Helens	50.70208° N; 1.09819°W	R ,F,S	12.12.24	10	92.8 (26.0)	99	<1	<0.5	N
Seaview	50.72082° N; 1.10872°W	R ,F,S	01.11.24	10	104.8 (38.1)	98	2 (2.8)	2	N
Ryde Pier	50.73390° N; 1.16032°W	P ,S	12.11.24	10	44.8 (21.1)	99	0.4 (1.3)	1	N
Cowes (West)	50.76646° N; 1.30057°W	P, B	18.10.24	5	157.6 (17.3)	1	2.4 (5.4)	99	N

same, so it is cancelled out. For species diagrams, photographs and further information refer to Hawkins & Jones (1992) and Smith (2020 ab, 2024). We have found that the most important and reliable indicator is the colour of the pallial tentacles visible around the perimeter of the mantle (Fig. 8). Larger *P. ulyssiponensis* may be well camouflaged with red algae, and this can be a useful aid to their location and identification (Fig.1).



Fig. 15: *Patella depressa* group on sandstone boulder at Watershoot Bay 17th October 2024. Note irregular outline of shell base, anterior shell apex and 'strong' rays/ribs leading from apex posteriorly, resembling 'fish-tail'. Older, worn specimen to the right.

Survey results

All three larger *Patella* spp. still occur at their former sampling sites, and have become more abundant since 1953 (Figs. 11-13). The range of warm adapted species has expanded in the east of the Island and *P. depressa* has been recorded on the Solent coast of the Island for the first time. Where species were Common or Abundant, multiple age cohorts could usually be identified and there was evidence of recruitment, often in moist areas and in shallow pools. A data summary is presented in Table 2.

Highest densities of *Patella* spp. were on the wave exposed southern and western shores, with over 400 per m^2 (all age cohorts) recorded on some boulders at Hatherwood Point in Alum Bay. Limpets were mostly absent from softer clay and marls, yet minor depressions in the soft chalk at Freshwater Bay and on limestone may create more optimal microhabitats for recruitment and feeding. Here and on the exposed Undercliff shores, where low tide conditions during the daytime are more humid, it is not uncommon to see limpets with shells raised high grazing quite freely – and noisily! The proportion of *P. depressa* in the mid shore region has increased markedly since 1953 (Fig. 14) and the species has become the dominant limpet on shores in the west of the Island (Fig. 15).

Coastal infrastructure, including concrete groynes and seawalls and limestone and granite rock armour has provided new habitat for both *P. vulgata* and *P. depressa*.

Patella pellucida

In the 1980s, the distribution of the blue-rayed limpet *P. pellucida* (Fig. 16) was generally widespread along the south coast of the Isle of Wight (Fig. 17). Recent records on the National Biodiversity Network map indicate that the species is still present in many localities in the south of the Island, and there have been some observations on the Solent coast too. Yet, population size is of concern as kelp (*Laminaria* spp.), has suffered significant losses in recent storms. Although the species can be found sub-tidally, most local records are intertidal or very close inshore, which may indicate that kelp is more sparsely distributed offshore. The ecotype *P. pellucida* var. *laevis*, which is pale coloured and confined to the base and interior of kelp holdfasts has not been recorded in recent years, yet can be searched for within the holdfasts of freshly washed-up kelp.

Discussion

We do not present a full time-series for Isle of Wight shores, so need to interpret the data with caution, and sampling methods have changed since the 1950s. On the English side of the Channel, the eastern geographical limits of *P. depressa* and *P. ulyssiponensis* occurred on the Isle of Wight until about 2000. Local populations have now increased and there is a range expansion eastwards along the mainland coast of England: *P. depressa* has been recorded at Beachy Head (in the 2010s) and Hastings (2020s) and *P. ulyssiponensis* at Dover in 2018 (Herbert, *et al*. 2022). The increase in local populations and range expansion of both these

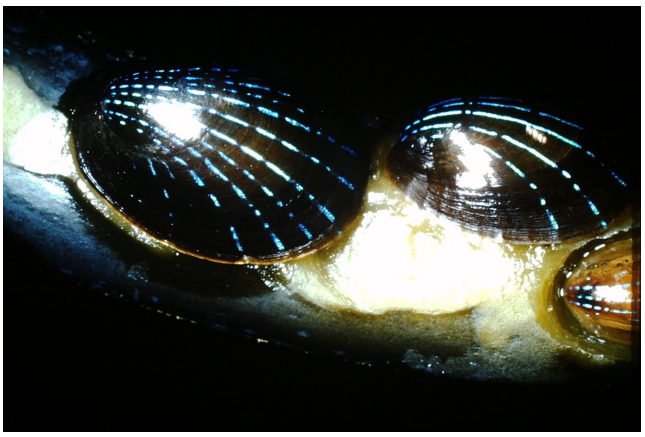

Fig. 16: Blue-rayed limpet *Patella pellucida* grazing on stipe of kelp *Laminaria digitata* at Freshwater Bay, April 1980.

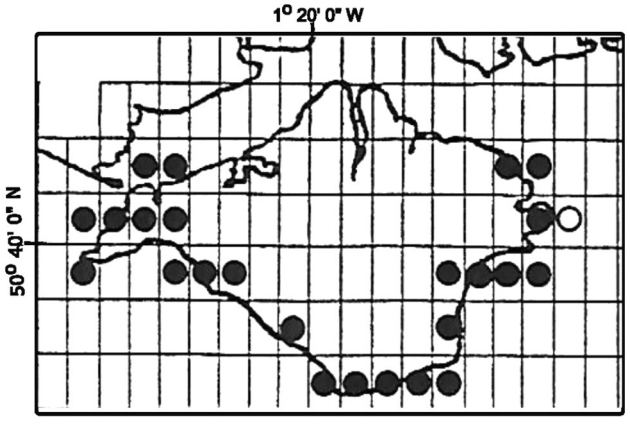

Fig. 17: Distribution of *Patella pellucida* adapted from Light (1990). Black dots indicate 'live animals'; open circle a 'worn shell'. The most recent NBN map (14.02.24) is similar with new records on the Solent coast.

species can be explained by climate warming, as reproductive period and fecundity increases with higher air and sea temperatures (Southward *et al*. 1995; Hawkins *et al*. 2008, 2009; Moore *et al*. 2011). Around the UK, sea surface temperature (SST) shows a significant warming trend of around 0.3°C per decade over the last 40 years (Cornes *et al*. 2023). Higher gamete output from a prolonged reproductively active season (Moore *et al*. 2011) from Isle of Wight populations will have increased the probability of larval dispersal eastwards towards the Sussex and Kent coast, overcoming hydrographic barriers including complex tidal currents and the gyre off Bembridge (Keith *et al*. 2011). In the early 1980s towards the end of the cool period from 1962/63 onwards, *P. depressa* was rarer at some south-western shores compared to the 1950s (Fig 13). However, odd individuals of *P. depressa* and *P. ulyssiponensis* were found by S.J.H at Culver Cliff and Bembridge (on the outer reefs), not previously recorded by Crisp and Southward. Yet, by the mid-1980s, the proportion of *P. depressa* amongst mid-shore limpets was on the rise, as at other locations in south-west Britain (Southward *et al.*1995 Fig. 17).

Larval settlement will have been enabled by increased habitat due to the construction of hard sea defences such as rock groynes, breakwaters (e.g. Monks Bay, Bonchurch; Cowes Breakwater; Elmer 'offshore islands' between Bognor and Littlehampton). These structures may have acted as 'stepping stones' and facilitated eastward expansion along the coast where there is soft-sediment substrate. Milder winters will have enhanced juvenile and adult survival of *P. depressa* as we know the species suffered high mortality during the cold winter of 1962-63 (Crisp, 1964; Prebble, 1968). The new limestone boulders placed at the foot of the cliff at Ventnor and Reeth Bay have created new habitat and the vertical range of *P. vulgata* has been extended. We do not present any data from the mainland shores of the Solent, however there are no natural rocky platforms and the only hard substrata are coastal infrastructures. Yet we do know that *P. vulgata* occurs on these structures and *P. depressa* has been found at Hayling Island (Hawkins *et al*. 2009) and Lee on Solent (S.J.H unpublished observations).

Interestingly, populations of *P. vulgata* also appear to have increased at most sites since 1953. Severe storms can remove large quantities of seaweed from exposed shores and this may have created more space for limpets to recruit, grow, and occupy. In the 1990s, dense fucoids, including knotted wrack *Ascophyllum nodosum*, occupied a wide zone on the shore just east of Castle Haven slipway, yet this has now disappeared, probably as a result of storms, combined with impacts of coastal defence works, and been replaced by grazing limpets. Over the past 30 years, a large patch of limpets has appeared within the canopy of *Fucus serratus* on the limestone reefs at Bembridge, just south of the lifeboat station. This could be as a result of natural cyclical patch dynamics (Hawkins & Jones, 1992), extreme summer heat that has trimmed back the brown fucoid algae and opened up the canopy, a higher storm frequency that has also removed algae, or reduced barnacle settlement which can impede limpet grazing .

The relationship between climate and species populations on rocky shores has only been established thanks to the maintenance of long-term times series on the Isle of Wight and elsewhere around the British Isles. The longevity and quality of the data base has influenced not just scientific curiosity and understanding, but also climate and coastal policy makers at a national and global scale (Hawkins *et al*. 2016). It is our hope that a new generation of marine ecologists and naturalists will continue to contribute and gain new insights in to the distribution of *Patella* and their biology and ecology in the years to come.

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Authors:
Roger J.H. Herbert
email: roger.herbert59@btinternet.com
Stephen J. Hawkins
email: s.j.hawkins@soton.ac.uk

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SOFT CLIFFS: BIODIVERSITY AND CLIMATE CHANGE

Colin R. Pope

Abstract : *Residents of the Isle of Wight have been made acutely aware of our eroding coastline in recent years as a number of catastrophic landslides and cliff collapses have impacted greatly on property, infrastructure, footpaths and roads. The Bonchurch Landslip (2023) was particularly catastrophic and there have been other smaller landslides and collapses around Ventnor.*

Is the current rate of land movement having an impact on biodiversity? It is too early to say, but some examples given here suggest that some species are being adversely affected. However, the species provided as examples here are frequently small, unobtrusive and difficult to identify, and longer-term studies would be needed to have confidence in these trends.

Keywords: Coastal erosion, Glanville Fritillary, invertebrates, bryophytes, lichens, Isle of Wight

Introduction

The Isle of Wight coastline has always been affected by a range of natural hazards including coastal erosion and cliff retreat, coastal landsliding and sea flooding. Our first president, George Colenutt gave his final lecture to the Society, 'Fifty years of Island coastal erosion' illustrated by lantern slides, 87 years ago (Colenutt, 1938). The rates of erosion and the risk of flooding from the sea are expected to increase over the coming century due to the impacts of climate change, including increasing storminess, increasing winter rainfall and rising sea levels. Coastal erosion is not always gradual and can occur through dramatic events such as landslides and cliff falls, where many metres of land may be lost in a single event. The landslide complex around Ventnor is particularly sensitive to future climate change. Landslides are triggered by the combination of increased toe erosion at the base of the cliff and increased winter rainfall promoting higher pore water pressures within the landslide.

The eroding southern coastline of the Island has long been recognised as important for biodiversity. It is a challenging environment for plants and animals. Exposure to gale force winds and salt spray, steep slopes with thin soils and frequent erosion and landslides, all shape unique and characteristic wildlife habitats. Nevertheless, these habitats are home to many nationally rare plant and animal species, quite often more southerly or Mediterranean species that have a toe-hold here on the south coast of England.

Biodiversity significance

From a biodiversity perspective, the soft cliffs and slopes are recognised as being one of the few habitats in the UK where pioneer communities of invertebrates have been able to survive without disruption by man. The southern coastline, subject to rapid erosion, has given rise to one of the finest series of soft cliffs, locally punctuated by steep ravines or chines, to be found along the British coastline, second only to the west Dorset coastline.

The importance of coastal soft cliffs for invertebrates hinges on their capacity to provide a historical continuity of micro-habitats rarely found with predictability elsewhere. Their unstable nature constantly creates bare ground and suppresses ecological succession. Bare ground is a key soft cliff habitat which offers nesting sites for burrowing bees and wasps, hunting grounds for visual predators such as ground beetles and the Cliff Tiger beetle *Cylindera germanica*, warm basking areas allowing thermophilic (warmth-loving) species to remain active in cooler conditions, and germination sites for wildflowers. Where cliffs are colonised by plants, pioneer plant communities provide valuable nectar and pollen sources for bees and other insects. The plants are also the food plants of phytophagous insects (such as the weevil *Baris analis*) and their predators, including many of the solitary wasps that nest on soft cliffs.

Gently slumping cliffs, with transient pools colonised by reeds and wet flushes provide a variety of habitats and ecological niches. These areas can accommodate invertebrates with aquatic stages in their life cycle including water beetles, craneflies and soldierflies; and provide food plants and refuge for insects with specific associations with aquatic plants. Seepages and pools provide wet muds that are required by many species of bees and wasps for nest construction. On most soft cliff sites there are a range of these micro-habitats, plus others such as calcareous grassland and scrub (Fig.1). Habitat variation on a very small spatial scale can produce an incredibly complex environment in terms of temperature, exposure, vegetation type and structure, and stability. It is the juxtaposition of a range of micro-habitats that



Fig. 1: The combination of pools, bare ground and scattered vegetation makes Atherfield Ledge a good site for invertebrates provided that slippages are not too frequent. Coltsfoot, shown in this picture, provides an early nectar source for insects. March 2016.



Fig. 2: Compton Bay March 2021.



Fig. 3: Redcliff March 2024.

Regular repeated slippages of soft cliffs have resulted in the loss of the prime breeding habitat of Glanville Fritillaries.

makes a site important. Invertebrate species often rely upon a range of habitat features to complete their life-cycles. For example, burrowing bees require friable materials in which to excavate nests but also depend upon nectar and pollen sources in close proximity. Sites which provide a range of micro-habitats on a small spatial scale are able to support a great range of species.

A survey of invertebrate life by Buglife in 2006 (Whitehouse, 2007) reached the conclusion that the Island's maritime cliffs and slopes support impressive overall totals of important invertebrate species, although to a lesser degree than the extensive West Dorset soft cliffs. One of the most important groups of insects on the Island's coast are the bees and wasps (Hymenoptera). Included in this group are nationally rare species such as the Large Mason Bee *Osmia xanthomelana* (although this species is now thought to be extinct on the Island), the mining bee *Lasioglossum angusticeps*, the Potter Flower Bee *Anthophora retusa*, the digger wasp *Mimumesa atratina*, the Black-headed Mason Wasp *Odynerus melanocephalus* and the Nomad Bee *Nomada conjugens*.

The beetle fauna of the cliffs is nationally important and includes such species as the Cliff Tiger beetle *Cylindera germanica*, the ground beetle *Drypta dentata*, the rove beetle *Bledius crassicollis*, Chestnut Click beetle *Anostirus castaneus*, and the weevils *Baris analis*, *Mononychus punctumalbum* and *Cathormiocerus cocius*. The butterfly and moth fauna are also very rich and includes several important moths including Beautiful Gothic *Leucochlaena oditis*; the micro-moth *Grapholita gemmiferana*; and *Metzneria littorella* a micro-moth feeding on seeds of Buck's-horn Plantain.

Many of these are thermophilic species. They may also have complex habitat requirements. Additionally, and importantly, they are often inconspicuous species which can only be recognised reliably by experts and, as such, it is difficult to assess how they are responding to increased erosion.

Glanville Fritillary

The 'flagship' species of our soft cliffs, the Glanville Fritillary butterfly *Melitaea cinxia*, is a species not found naturally elsewhere in Britain and is easily recognised both in the adult and larval stages (Figs 4, 5 & 6).It has been the subject of a remarkably long-



Fig. 4: An adult Glanville Fritillary. Photo Andy Butler



Fig. 5: Glanville Fritillary larvae in March.



Fig. 6: Glanville Fritillary larval webs. In the picture, the larvae have vacated the web to the right and moved to a fresh web.

running monitoring programme by members of the Isle of Wight Natural History and Archaeological Society. The Glanville Fritillary is found in colonies along much of the southwest coastline and eastwards to Bonchurch. There is also a population centred around Redcliff, Sandown. The annual monitoring of spring larval webs has taken place every year since 1983! A few of the original surveyors are still taking part!

The information gathered has given us a good overall picture of how the butterfly is faring (Butler, 2008). Essentially, the size of the population can vary considerably from one year to the next. Periods of abundance are generally followed by population crashes, but the species has a great ability to recover.

Although the larval foodplant of this species, Ribwort Plantain (*Plantago lanceolata*), is widespread, the butterfly is confined to areas of short grassland on soft cliff slopes. Early bioclimatic modelling attempts by biologists to predict how species would respond to a warming climate suggested that the Glanville Fritillary would be one of the first species to expand their range northwards from the south coast of the Island into southern England and to produce two broods per season, as they do on the Continent. To date, this has not occurred. However, larval monitoring is demonstrating that more subtle changes in their behaviour are beginning to be seen.

The Glanville Fritillary exists as a series of metapopulations. If it is lost from one site, recolonisation will occur from nearby sites. In recent years, in many places the soft cliffs have become treacherous to visit early in the season making it difficult to assess populations accurately. Recently slipped cliffs are bare of vegetation and if slumping recurs before a vegetation community can begin to colonise, as has often been happening, there are no or few suitable niches for the butterflies to lay their eggs.

In good years, the population expands and both butterflies and larval webs can be found in sites which have been considered to be marginal. These are in open areas on the gravel capping of the downs, on south facing chalk grassland and greensand ridges. Surveys in very recent years (Paul Davies, pers. comm.) have demonstrated that these sites, inland from the southwest coastline, now hold substantial, and probably increasing, populations whilst the populations at some coastal sites have shown a medium-term decline. They appear to have been lost from one or two coastal sites.

It would be wrong to conclude that the populations are moving inland with the advent of increased coastal erosion but coastal populations in some sites may be difficult to sustain; whilst some inland sites are currently able to maintain viable populations that may not have been the case in the past.

Plant communities on Redcliff

The unstable nature of soft cliffs and slopes, constantly creating bare ground and suppressing ecological succession has also been important for the survival of some flowering plants and communities of bryophytes which are otherwise rare nationally. The moss Oval-leaved Pottia, *Pterygoneurum ovatum,* was once common in Victorian times on mud-capped stone walls but is now found on open calcareous ground (Porley & Hodgetts, 2005). It has declined markedly in the 20th century and is now rare and declining.

On the Island, *Pterygoneurum ovatum* is a component of a specialised bryophyte community confined to maritime-influenced cliff-top thin calcareous grassland at Redcliff (Fig. 7).



Fig. 7: The bryophyte community at Redcliff showing a clump of *Pterygoneurum ovatum* at the centre of the picture surrounded by tiny triangular green shoots of *Acaulon triquetrum*. December 2018 Photo George Greiff

The habitat was very interesting. It was growing close to the cliff edge on a thin band of Lower Chalk in open ground disturbed by rabbit burrowing (Fig. 8).



Fig. 8: The specialised bryophyte and flowering plant community at Redcliff is confined to the narrow rabbit disturbed break of slope showing bright green in this photograph taken in December but bare of vegetation in the summer.

This community primarily comprises small to tiny mosses that grow through the winter and die in the spring. They are impossible to find from late spring to autumn when their sites are frequently parched and sun-baked. *P. ovatum* was recorded at Culver in 1909 on an Isle of Wight visit by Henry Herbert Knight, a former president of the British Bryological Society. It was not found here again until December

2018 when George Greiff rediscovered it. Associated species included the tiny ephemeral Triangular Pygmy-moss, *Acaulon triquetrum*, an even rarer moss listed on Schedule 8 of the Wildlife & Countryside Act 1981 and legally protected under Section 13. It is known from just a tiny handful of sites on the south coast of the Island and Dorset. Both these species enjoy semi-arid conditions and are much more frequent in the Mediterranean region.

Interestingly, the very restricted site at Redcliff is also home to a nationally scarce flowering plant, Hairy-fruited Cornsalad, *Valerianella eriocarpa,* another plant which behaves as a winter annual, germinating and growing during the winter, flowering in the spring and then dying down (Fig. 9).



Fig. 9: Hairy-fruited Cornsalad, *Valerianella eriocarpa*.

Valerianella eriocarpa was at one time considered to be an uncommon weed of arable sites but further studies in the early twenty first century (Pearman & Edwards, 2002) considered it to be native on thin, drought-prone calcareous soils in coastal areas of Dorset and the Isle of Wight. At the Redcliff site, the plant grows with Dwarf Spurge, *Euphorbia exigua*, a nationally vulnerable plant of arable land which has found similar conditions at Redcliff, probably a native site where it behaves as a winter annual.

When George Greiff and John Norton visited the Redcliff site early in the year in 2024, they were unable to find any sign of the specialised bryophytes and they considered that the very restricted site they occupied had been lost to erosion (G. Greiff, pers. comm.). The author visited the site with Nick Aston on 27th April 2024 to assess the population of *Valerianella eriocarpa* and, after much searching, located a single flowering plant. I considered that at least part of the site could have been lost to erosion.

This may be another example of biodiversity loss as a result of an increased erosion rate of coastal cliffs. However, it is too soon to be confident if this is the case. Each of these specialised plants show populations which fluctuate considerably from year to year. In a good year, the population of *Valerianella eriocarpa* at this site exceeds 600 plants. Each of these species requires soil disturbance to create the open ground they require and, provided a few propagules persist, they can rapidly increase their population if conditions are right. On the other hand, the very restricted area they occupy may have been permanently lost to erosion.

The Undercliff

St Catherine's

Most cliffs form at the junction of land and sea, where groundwater-driven land slippage and/or erosion by the sea have created a break in slope, but on the Island, there is also an extensive landslip zone. The Undercliff landslide complex is a wide slumped skirt of land (stretching for nearly 10 km along the coast) from Luccombe in the east to Blackgang in the west. It is sheltered to the north by an inner cliff rising to 140m above sea level. It was activated as a consequence of aggressive coastal erosion following a rise in sea levels after the last Ice Age, about 10,000 years ago. The south facing, sheltered Undercliff has a warm, humid environment, which has given rise to its own distinctive flora. Historically, this would have been a largely open, grazed landscape interspersed with tumbled rocks and wooded pockets. It was an outpost for some plants with a more Atlantic distribution, in particular bryophytes. The open undercliff landscape has survived best in the area around St Catherine's Point and slumps and slippages still occur here, creating open ground habitat. The soils are complex, being a jumble of calcareous chalky soils and more acidic greensand and chert. Springs emerging from the inner cliff are a cause of slumping and give rise to ecologically interesting habitats.

Just west of Windy Gap carpark the seepages are habitat for one of Britain's rarest leafy liverworts known as Blackwort (*Southbya nigrella)* (Fig. 10).

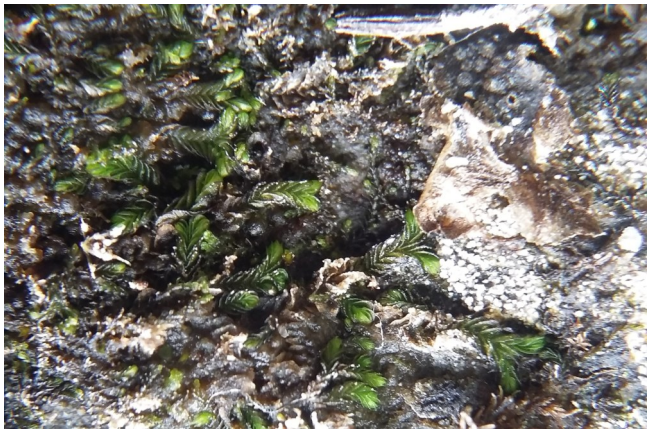

Fig. 10: Blackwort, *Southbya nigrella,* at St Catherine's Point. April 2017 Photo: George Greiff

It is critically endangered in England, although widespread in the Mediterranean. In this country, it is only known from about twenty sites on Portland Bill in Dorset and the small population at St Catherine's. I was first shown the plant by Francis Rose, Ted Wallace and Rod Stearn in 1983. At the time, there was an easy footpath from the Windy Gap carpark to Blackgang, and *Southbya nigrella* was readily found on shaded calcareous rocks by a stream that crossed the footpath. Also in the

vicinity was another very rare small calcicolous leafy liverwort, *Cephaloziella baumgartneri,* a species known only from a few sites on the southern coast of England.

By 1992, the site was becoming overgrown, principally by invasive Buddleja. In 2001, a period of heavy rainfall reactivated the landslide complex, resulting in a major landslide around the area occupied by the rare bryophytes. The footpath was closed and access to the site became quite difficult. When a group of bryologists together with National Trust and Natural England staff visited the site in May 2017, only a very few plants of *Southbya nigrella* were located and the site had become heavily overgrown and shaded by scrub. Sharon Pilkington visited the area in 2024 and discovered a small area of *Southbya*, together with *Cephaloziella baumgartneri* in more open slumped ground below the original site (Mark Larter, pers. comm.) (Fig. 11).



Fig. 11: Slumping ground with seepages provides the ideal habitat for *Southbya nigrella* and *Cephaloziella baumgartneri* at St Catherine's.

Landslips are vital to ensure the survival of these very rare extreme southern bryophytes, which require calcareous sandstone boulders brought downslope by undercliff slumps and washed by seepages. The area in which they occur is extremely localised and threatened not only by the frequency of landslides but also by invasive scrub.

Bonchurch Landslip

Bonchurch Landslip is a Site of Special Scientific Interest and one of its listed features is as an outpost for a suite of shade-tolerant western bryophytes including the Starry Thyme-moss, *Mnium stellare* (Fig. 12), and the leafy liverworts Rossetti's Pouncewort, *Cololejeunea rossettiana* and MacKay's Pouncewort, *Marchesinia mackaii* (Figs. 13 & 14). Bonchurch Landslip also has an interesting lichen flora including the rare western old woodland lichen *Scytinium* (*Leptogium*) *lichenoides* (Fig. 15). The wooded landslip provides a sufficiently humid environment to support several species which principally have a western distribution in Britain.

The ecological quality of the area has deteriorated in recent years as Atlantic Ivy (*Hedera hibernica*) has grown unchecked, smothering the rocks and trees where these specialised species occurred. This is a more general feature of woodlands and has been



Fig. 12: *Mnium stellare* in Bonchurch Landslip in 2008.



Fig. 13: *Marchesinia mackaii* at Bonchurch Landslip in 2008.

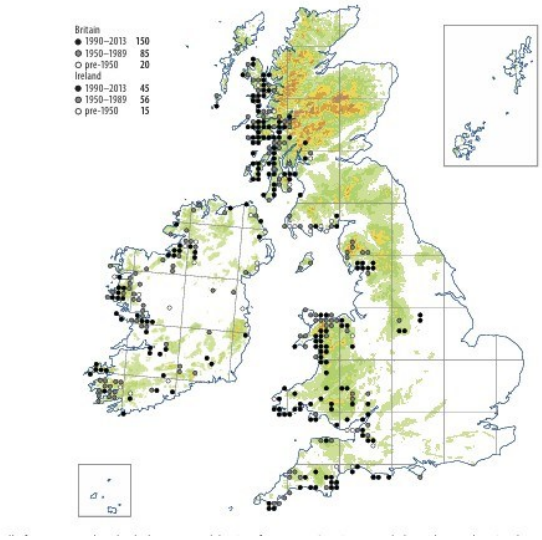

Fig. 14: This distribution map of *Marchesinia mackaii* shows how Bonchurch Landslip is an outlier of this predominantly western species and is typical of a number of western bryophytes and lichens occurring in Landslip. British Bryological Society.

considered to be a result of lack of woodland management and milder winters.

Nevertheless, surveys by George Greiff in more recent years have demonstrated that the specialised bryophytes have persisted, albeit extremely locally and in reduced quantity. Also, I have found a fertile population of *Scytinium lichenoides* surviving in one site together with some of the more interesting crustose lichens on old Hazel in the vicinity.



Fig. 15: The lichen *Scytinum* (*Leptogium*) *lichenoides* in Bonchurch Landslip in 2008, now lost in the landslip. Bonchurch Landslip was its sole Island locality.

The catastrophic landslide in 2023 has completely destroyed most of the areas where these specialised lower plants occurred (Fig. 16).



Fig. 16: Aerial view of Bonchurch Landslip taken in 2024. Photo: Mike Collins

The lichen-rich site has been completely buried. Many greensand boulders have become exposed, and these could provide suitable niches for the bryophytes to recolonise. However, it is more likely that the open area will be colonised by Ivy and tree regeneration, destroying this opportunity.

Ironically, the best surviving population of the leafy liverwort *Cololejeunea rossettiana* was not on rocky outcrops but along the north-facing wall at the top of the cliff leading to the Devil's Chimney. This area has survived the slippage, but the site is likely to be lost again by aggressive ivy colonisation (G. Greiff, pers. comm.) Small scale landslips are probably useful in creating new opportunities to recolonisation by lower plants, but the scale of the recent landslide makes this unlikely.

Conclusions

Evidence suggests that at least some of the rare and specialised soft cliff species are being adversely affected by the current rapid rates of coastal erosion. The Glanville Fritillary seems to be able to successfully colonise suitable micro-habitats inland from the coast. It may be that some of the other specialised invertebrates are able to do the same but for many of them this seems unlikely as their preferred habitats are unlikely to be duplicated inland.

Similarly, the bryophytes are rare because the specialised conditions they require are not replicated inland. Without specialised monitoring, the disappearance of some of these species could happen before we become aware.

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Author: C. R. Pope
Email: colinrpope@gmail.com

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WHAT CAN DOMESDAY BOOK TELL US ABOUT THE ISLE OF WIGHT?

John Margham

Abstract: *The purpose of the Domesday survey is discussed and accessible printed editions reviewed. Information about individual manors and larger estates is examined and links between manors investigated. Inferences from comparisons between and within manors are presented which inform a case study of Arreton parish. Evidence for the form of rural settlement is presented before assessing the Domesday Book entries for incipient medieval towns. A case study of Carisbrooke culminates with a reconstruction of its morphology in 1086 and evidence for the development of individual manors with the fragmentation of extensive estates is outlined. Domesday Book's value and limitations in informing about eleventh-century Wight is summarised.*

Keywords: Domesday Book, manors, settlement, land use, population

Introduction

The records that were compiled for the King in 1086 and later known as Domesday Book contain a wealth of information. They are, however, written in abbreviated form using technical terms. This paper will provide the background to when and why the survey was commissioned, provide a guide to accessible versions and translations, explain the information contained within individual entries and inferences that can be made from comparing various statistics, then explore the origins of our medieval towns and the development of medieval manors.

What was Domesday Book for?

Domesday Book was commissioned by William the Conqueror at midwinter 1085 whilst with his council at Gloucester. In the words of the Anglo-Saxon Chronicle (E):

> *Then he sent his men all over England into every shire and had them ascertain how many hundreds of hides there were in the shire, or what land and livestock the king himself had in the land, or what dues he ought to have in 12 months from the shire. Also he had it recorded how much land his archbishops had, and his diocesan bishops, and his abbots and his earls, and … what or how much each man had who was occupying land here in England, in land or livestock, and how much money it was worth. He had it investigated so very narrowly that there was not one single hide, not one yard of land, not even … one ox, not one cow, not one pig was left out, that was not set down in his record. And all the records were brought to him afterwards*
>
> (Swanton 1996, 216).

The *'records … brought to him afterwards'* were condensed into Great Domesday (other less contracted versions do exist, but not for our area). Great Domesday is not quite as detailed as the quote from the Anglo-Saxon Chronicle would suggest, with few explicit mentions of individual oxen and cattle. Much academic ink has been spent in ascertaining exactly what Domesday Book was for. The Chronicle does, however, tell us: Domesday Book was a record of who held what, their assets, and its value for taxation (geld).

Domesday Book in print

The Domesday survey was conducted in circuits. The Isle of Wight was enumerated as part of Hampshire, (the south-eastern circuit also included Berkshire, Kent, Surrey and Sussex), explaining why modern translations of Domesday Book entries for the Island appear in volumes entitled 'Hampshire'. Phillimore published their Hampshire volume in 1982.

This included a type-set version of the original text, which had been produced in 1783 (Munby, 1982). The Alecto Domesday Hampshire volumes (Williams and Erskine,1989) consist of a photographic reproduction of the folios and a translation based upon that first published in the Victoria County History of Hampshire volume 1 (Doubleday, 1900). This is the version that is preferred by the present author as technical terms have been preserved in the translation. The Alecto edition was also used by John Medland (2015) in his *Discovering Domesday Wight*. A complete translation of Great Domesday has also been published by Alecto (Williams and Martin, 1992). The pages of Domesday Book are usually referenced by folio numbers or verso folio numbers for each county (for example 53 and 53v). This system will be followed in the present paper.

Brook - a Domesday Manor

Domesday Book enumerated a total of 124 named landholdings on the Island. Most of the entries follow the following format which can be used to illustrate the information contained within. The example chosen here of a 'typical' entry is that of Brook:

> *King William holds BROOK [Broc] in demesne. Earl Tostig held it. [It was] then [assessed] at 3 hides; now at 1 hide. There is land for 6 ploughs. In demesne are 2 ploughs; and 3 villans and 7 bordars with 2½ ploughs. There are 9 slaves, and a mill rendering 15d., and 6 acres of meadow. TRE it was worth £7; and afterwards £6; now £7; and yet it renders £7more [52].*

The constituent parts of this particular Domesday Book entry will be examined in turn to illustrate what can be learned about an individual landholding.

The Manor

Brook was not specifically referred to as a manor in the text but would have been seen as one. The term manor (Latin *manerium*) was introduced by the Normans after the Conquest of 1066 and was used to denote an estate or an estate centre (Williams and Martin, 1992, 1433)

Place-Names

Domesday Book is an invaluable source for place-names. Although Anglo-Saxon land charters record some place-names, Domesday Book was the first

systematic survey of the Island with many names being recorded for the first time. An example of this is the 27 Island *tūn* (-ton, -tone) place-names that were documented in 1086, compared with only two in the tenth century (Margham, 2017, Table 1). All Domesday place-names on the Island can now be identified with reasonable confidence. Names such as *Sandford* and *Broc* have remained the same or similar whereas others such as *Scaldeford* are not recognisable today. Some Domesday place-names would have been of recent origin, such as Niton (*Neeton*) 'the new *tūn*', and Knighton (*Chenistone*) 'the farmstead or estate of the young thanes or retainers' (Mills 1996, 64) where Domesday Book itemises six landholders before the Conquest, each having a share in the mill (39v). It is quite possible that Knighton was known as *Linlande* in 951x955, named in a fragmentary charter whose bounds would fit this location (Margham 2007, 119-20).

Landholders

Domesday Book tells us that in 1086, in the time of King William (*TRW:* Latin *Tempore Regis Willelmi*), Brook was held as part of the king's demesne (royal lands). In or before 1066 (*TRE*: *Tempore Regis Edwardi*) it had formed part of Earl Tostig's West Wight estate, although Tostig had gone into exile in 1065. Another example of an apparently anachronistic *TRE* 'owner' was Earl Godwine who died in 1053 but was recorded as the ultimate landholder of Bonchurch, Wroxall and *Ulwartone* (Woolverton in the Bembridge Isle). Brook was a manor which was not subinfeudated as no sub-tenants are mentioned *TRE* and *TRW*. An example of a subinfeudated manor is *Lamore* (Fulford) where

> *'The same William [fitzStur] holds MOOR, and Anskeitel [holds] of him. 3 free men held it of King Edward' (53).*

Hidage

A hide was originally an area of land sufficient to support an extended family, but by the eleventh century was used to assess tax (geld). It was **not** an area of 120 statute acres, an oft-quoted figure. The area of a hide was variable, dependent upon the productivity or perceived potential of the land (Margham 2003). Thus intensively-used land of one hide such as arable was a much smaller area than a hide of extensive wood-pasture. The majority of Island manors had small hidages, the most common recorded *TRE* being of one hide, with 30 instances. The term 'virgate' (Latin *virgata*) is also to be found amongst Island Domesday Book entries, being a quarter of a hide.

Ploughlands

The hide was an antiquated assessment by 1086. It would appear that by then the ploughland was succeeding the hide as a unit of assessment, based on arable resources within a manor. Sally Harvey (1985, 92) has argued that

> *'ploughland figures are, first and foremost, contemporary fiscal assessments of 1086-7. As such, they will naturally often reflect agricultural or simply arable capacity'.*

Thus, like the hide, the area of a ploughland would have been variable, dependent on factors such as soil fertility.

The Demesne and Manorial Population

Medieval manors frequently consisted of demesne land, the 'home farm' run directly from the manorial centre, and lands beyond this mainly farmed by villans and bordars which in the Anglo-Saxon period was known as 'warland' (Faith 1997, 89-125). This type of structure cannot be seen explicitly at Brook, but two examples can be cited here: Arreton (39v) had five ploughlands, three ploughteams and seven slaves within the demesne, and 10 ploughteams, 10 villans and 12 bordars outside the demesne; whereas Chale (52v) had one ploughland, one ploughteam and four slaves in the demesne, and one ploughteam and four bordars outside. The three categories of household heads recorded from the Island were villans, bordars and slaves. A bordar was

> *'a cottager: a peasant of lower economic status than a villan'* whereas a villan was *'A peasant of higher economic status than a bordar'*
>
> (Williams and Martin, 1992, 1431, 1436).

Apart from slaves, the only addition to this categorization of population was the single instance of

> *'A certain vavasour, having 2 cows'* in Adgestone (53), a vavasour being *'a retainer of lower status than a vassal'* (Williams and Martin, 1992, 1436),

and eight 'men' within Bowcombe manor (52). The recorded numbers of heads of households in Domesday Book can be shown to be not comprehensive, as illustrated by anomalies mentioned below, and through studies of other areas such as the Fenland of eastern England (Oosthuizen 2017, 16-19).

Manorial Assets

Slaves, the least free of the Domesday working population, were enumerated as part of the assets of a manor, as can be seen at Brook where the nine slaves were listed alongside the mill and the six acres of meadow. Other manorial assets within Island manors were a bakehouse at Cheverton, herbage in Sandford with Week, several instances of (water) mills, salt-pans within Bowcombe, Watchingwell and Whitefield, a fishery at Preston, and many instances of woodland. The 'ploughs' enumerated would have been ploughteams which usually consisted of eight oxen. This explains the fractions of 'ploughs' recorded from some manors, for example at Duton where 'In demesne is half a plough' (54).

Changing Values

Domesday Book records changing values of manors from 1066 to 1086. Some manors increased in value, such as one of the Luton manors which 'was worth 10s.; now 12s' (54). Brook is an example of a manorial value being the same *TRE* and *TRW* at £7, but its value dropped 'afterwards' (in the intermediate period, probably between 1066 and 1070: Darby, 1977, 232) to £6. Several manors lost value between the Conquest and 1086, such as Mottistone '*TRE* it was worth £10; and afterwards, as now, £6' (53v).

Calbourne and the Bishop of Winchester

As we have seen, many Island manors had relatively small hidages and were of limited extent. There were, however, exceptions to this. Seven manors

were rated at four or more hides *TRE*: the four hides of Afton, Arreton and Bowcombe (39, 52), Wroxall five (39v), Shalfleet six (53v), Freshwater 15 (52) and 32 in the bishop of Winchester's Calbourne (52v). The Calbourne estate can be taken to be representative of a more extensive Domesday Book entry for an Island manor:

> *Walkelin, Bishop of Winchester, holds CALBOURNE [Cavborne] in demesne. It always belonged to the monastery. There are 32 hides; but it only paid geld TRE, as now, for 17 hides. There is land for 25 ploughs. In demesne are 6 ploughs; and 27 villans and 15 bordars with 14 ploughs. There are 11 slaves, and 2 mills rendering 6s. 3d., and 8 acres of meadow, [and] woodland for 20 pigs.*
>
> *Of this land Robert holds 6 hides, Herpul 2 hides, and Alsige 3½ hides. 7 aloderies held these hides of the bishop, and could not withdraw elsewhere or from him. There are 3½ ploughs ; and 3 villans and 22 bordars with 5 ploughs. There are 12 slaves, and 15 acres of meadow. Mauger holds the church of this manor, with half a hide, and there he has 1 plough with 1 bordar.*
>
> *The whole manor, TRE and afterwards, was worth £16. Now what the bishop has [is worth] £30; and yet it is at farm for £40, but it cannot bear or render it. What the men hold [is worth] £7; [what] the church [holds], 30s [folio 52v].*

Whilst the first part of this account has much in common with the more typical Domesday Book entries for the Island, four items can be highlighted for further comment: the enumeration of hides, woodland and pigs, the mention of a church and the existence of un-named manorial sub-holdings.

Beneficial Hidation

The entry for Winchester's Calbourne estate illustrates an apparent discrepancy between the actual number of hides, *i.e.* 32, and the hides that were liable to pay geld: 17. This difference is an example of 'beneficial hidation', the only explicit example on the Island of an official reduction of the tax burden. The royal manor of Bowcombe (52v) is a further example which can be deduced from its extensive area which also included much of the later parish of Northwood, in contrast with it being assessed at only four hides *TRE* and then 'now at nothing' in 1086. Through a comparison of the ratio of 15 ploughlands at Domesday to the hidages of other manors it can be suggested that it consisted of seven or eight hides (Margham, 2025, 204). Some manors were not given a hideage rating, for example Yaverland where 'The King holds YAVERLAND. King Edward held it. It was not assessed in hides' (39v). In addition to Bowcombe, several manors had a significant reduction or even abolition of their geld liability by 1086, for example from one hide to half a virgate at William fitzStur's *Hardley* (near Bembridge; 52v) and from 1 hide to nothing at nearby *Woolverton* (39v), held by King William. Such instances were usually associated with crown lands or those of the Conqueror's 'new men' from over the Channel (see below: Changing Landholders).

Woodland

The assets of the Calbourne estate included *'woodland for 20 pigs'*. We should not envisage that there were only 20 pigs in the wood-pasture of the claylands to the north of Calbourne as this appears to be a number denoting a fraction of the herd for taxation purposes. A similar situation existed in the neighbouring extensive landholding of Shalfleet, where there was also woodland for 20 pigs (53v). Most Island woodland was of smaller extent, for example woodland for one pig at Barnsley, woodland for fencing at Ningwood, and woodland without pannage at Pan (53v, 54; Map 5 below).

The Church

Calbourne had a church which along with half a hide was held by a certain Mauger. It is not specified whether Mauger was the priest, but this appears likely on an ecclesiastical estate. Neighbouring Shalfleet also had a church listed amongst its assets. Domesday Book explicitly mentions other churches: Arreton where 'The Abbey of Lyre holds the church of this manor' (39v), Bowcombe (Carisbrooke), also held by the monks of Lyre (52), and St Nicholas within Carisbrooke Castle which we know about through the Domesday Book entry 'St Nicholas has of King William 1 hide in Shalcombe' (52v). A church at Bonchurch is attested by its place-name *Bonecerce* (53) and Freshwater church is implied as 'Of these 15 hides the Abbey of Lyre holds 3 virgates' (52). Thus, Domesday Book documents the existence of seven churches. This is not a complete tally, however, as there is evidence of several more churches by 1086. Domesday Book states that 'The Abbey of Saint-Marie of Lyre has in the Isle of Wight 6 churches, to which belong 3 hides and 2½ virgates of land' (52v). It would appear from later evidence that the Norman Abbey of Lyre had been 'given' a total of seven churches on the Island by its patron William fitzOsbern between 1067 and his death in 1071. A document in the Cartulary of Carisbrooke Priory of 1155-58 itemising 'the gift of earl William' lists the churches of *Caresbroc, Arretona, Freskewatre, Godeshull, Wippingeham, Necherche* (Newchurch) and *Neuton* (Niton) (Hockey 1981, 11). Along with the non-Lyre churches of Bonchurch, Calbourne, Shalfleet and St Nicholas this brings the total to 11. There is also physical evidence for the



Fig. 1: Calbourne church from the north-west. Mauger would have been familiar with the former hood-moulded doorway of Anglo-Saxon proportions depicted here, the position of which suggests a church with a cruciform ground plan in the eleventh century (Tomkins 1796).

existence of Brading church by *c.*1100 (Margham 2016).

Sub-holdings

The account of the bishop of Winchester's Calbourne estate also includes the un-named sub-holdings held by Robert, Herpul and Alsige. Robert's six hides can be identified with Limerstone and the other two were plausibly *Uggaton* and Wayte's Court, also to the south of the chalk ridge (Margham, 2024). A total of 12 Island Domesday manors had sub-holdings, ranging from instances in Shalfleet of 2½ virgates, half a hide and one hide (53v), one of which would have been Chessell, to smaller areas such as the half virgate in Knighton (39v).

Links between manors

Domesday Book documents links between manors. These can be categorized as adjoining land-holdings with the same place-name, links between manors with differing names over varying distances, and connections with mainland manors. These will be explored in turn.

Shared Place-Names

The bishop of Winchester's estate was not the only one named Calbourne. A second entry for *Caveborne* of a little less than 3 hides *TRE* was not held by the bishop (52v). This can be identified as Westover, adjoining Calbourne village. The loss to Winchester not long before 1066 is implied by the identical place-names. A similar process of the hiving off of part of an estate can be seen in the two instances of Shanklin: *Selins* (53) and *Senclinz* (53-53v). The one hide of Nettlestone had been divided into three equal parts by 1066 (39v, 53v) whereas the three instances of *Scaldeford* (39v, 53), identifiable as Hyde, Ninham and lost *Selbournes,* consisted of one manor of half a hide and two of one virgate *TRE,* another example of a former one-hide estate (Margham, 2019). Other shared place-names are Adgestone, Appleford, Atherfield, Barnsley, Chale, Chillerton, Chilton, Freshwater, Hamstead, *Huffingford* (Blackwater), Lessland, Luton, Merstone, Shide, Shorwell, Standen, Whippingham, Whitefield and Yaverland.

Linked Manors

Linked manors, single Domesday Book entries consisting of two or more different place-names, can be categorized as those being within two miles of each other: Atherfield, Dungewood and Walpan; Borthwood, Branstone and Lessland; Puckpool and *Etharin* (St Helens); and Sandford with Week (Godshill Park) (52v, 53v, 39v), and those of five miles or more apart: Niton and *Abla* (Apse); *La Done* and Bathingbourne; Knighton and *Done*; and Stenbury and Whippingham (40, 39v). The first category appears to reflect the lumping together of nearby manors by the new landholders after 1066: King William, in three of the above entries, and William fitzStur's Borthwood, Branstone and Lessland. Of the linked manors which were further apart, Knighton and *Done,* and *La Done* and Bathingbourne, both reference the Down Court area high up on the Island's southern chalk downland (Kökeritz, 940, 252-3). In the fragmentary charter of King Eadred of 951x955 the bounds of Bathingbourne include *'and the outlying pasture common with other men'* referring to this same area of downland. The charter also includes *Linlande* whose bounds mention *'the outlying pasture and the woodland pasture common to other men'* (Margham, 2007, 117-120) which when compared with the Domesday Book entry for Knighton and *Done* reinforces the identification of *Linlande* with Knighton mentioned above. Stenbury (and Whippingham) and Niton (and *Abla*) also reference the southern chalk downland. As already mentioned, the place-name Niton appears to have been of relatively recent origin in 1066 so it can be suggested that Niton, and perhaps even Stenbury, represent the intensification of land use and development of settlement in this downland area which were recognised as manors in the Domesday survey whilst retaining links with manorial centres elsewhere.

Mainland Connections

Various links between mainland manors and the Isle of Wight were documented in Domesday Book. Some of these were concerned with royal and ecclesiastical administration. The royal manor of Amesbury (Wiltshire) collected the farm of one night (a levy of produce to support the king's household) to which Bowcombe manor contributed (52; Williams and Martin, 1992, 162). The bishop of Winchester's Calbourne estate appears to have been administered from his estate at Downton (Wiltshire) (Margham, 2006, 96-8). The folios relating to mainland Hampshire document un-named landholdings on the Island: Breamore one hide, Eling two berewicks (outlying portions), Holdenhurst seven hides, Ringwood an unspecified area, and the canons of Holy Trinity of Twynham (Christchurch) one hide (Margham, 2006, 96-100). The most distant connection was with Shepshed (Leicestershire) where

> *'from this land come £6 as farm by order of the Bishop of Bayeaux for the service on the Isle of Wight'* (Williams and Martin, 1992, 629)

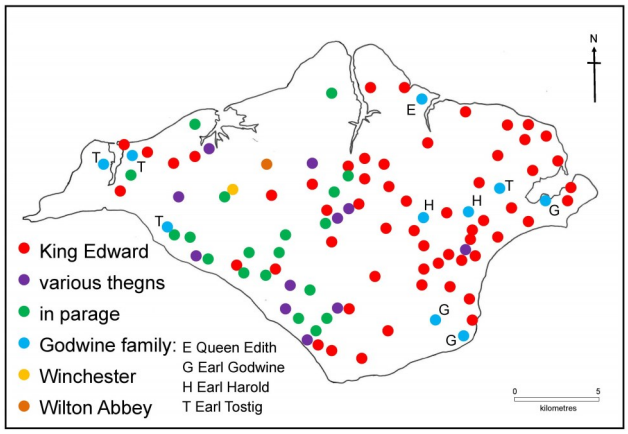
a contribution for the defence of the Island ordered by bishop Odo, William the Conqueror's half brother.

Comparisons between manors

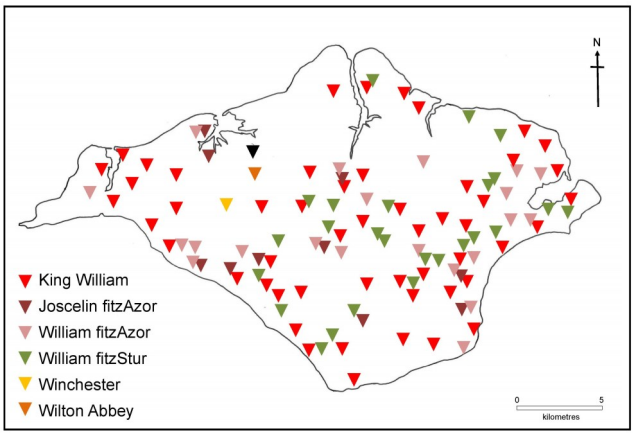
So far, much of the above has concerned individual manors on the Isle of Wight although some wider connections have been made. The following section examines what can be learned through making comparisons between *TRE* and *TRW* and through comparing statistics within and between Domesday Book entries.

Changing landholders

The period after the Norman Conquest saw a revolution in landholding throughout England with the widespread granting of manors to William I's 'new men'. On the Island these were William fitzOsbern, who as mentioned above died in 1071, William fizStur and the father of William and Joscelin fitzAzor. FitzOsbern was granted royal authority over the Island due to its important strategic situation. His estates were inherited by his son Roger of Hereford, but these reverted to the crown a year after the latter's rebellion in 1075 (Margham, 1994, 8-13).



Map 1: Primary landholders in or before 1066 (Margham 2025, map 3.5). Parage means shared ownership of land by kinsmen (Williams and Martin 1992, 1434).



Map 2: Major landholders in 1086 (Margham 2025, map 3.6)

King Edward had many estates on the Isle of Wight (Map 1). Thirty-one of these were held by King William in 1086, probably coming to him via William fitzOsbern and his son Roger (Map 2). William also held most of the manors that had belonged to the Godwinsons (the sons of Earl Godwine), on the Island these being Tostig and Harold. The King also held Wootton, which was formerly Queen Edith's, Godwine's daughter. All 23 of William fizStur's Island manors had belonged to King Edward but these may have devolved to him via fitzOsbern. Most of the manors held by the fizAzors in 1086 had belonged to King Edward. Several of these were apparently inherited from their father Azor, suggested by the equal division between the brothers of properties with the same place-name: Chillerton, Chilton, Hamstead and *Scaldeford*, with Shankin and Shide divided less equally (53, 53v).

The pre-Conquest landholders were not, however, completely dispossessed. The Bishop of Winchester and the Abbess of Wilton retained their estates of Calbourne and Watchingwell. There were nine separate individuals with Old English personal names mentioned *TRW*. Sixteen manors were associated with such names, eight of which were primary landholders (not tenants). Examples of these are Wulfnorth at Lea (now Sandown airport) and Alfric at Sheat (53, 53v), both of whom had been primary landholders *TRE*, and Alsige at Thorley (53v) who had succeeded Earl Tostig.

'Productivity'

Margaret Gelling (1992, 191) pioneered the mapping of *TRE* hides against historic parish boundaries *'on the assumption that there is likely to be some relationship between hidage assessment, area, and the quality of the land'*. This approach to 'productivity' of contrasting landscapes was developed by the present author for the Isle of Wight (Margham, 2003, table 2). In the West Wight it was possible to reconstruct Domesday manorial boundaries, but elsewhere historic parish boundaries were used.

There are caveats in the reliability of this approach on the Island: the degree of coastal erosion, manors not assessed in hides, and the unknown locations of lands administered from mainland Hampshire manors. It does, however, provide evidence for the 'productivity' for much of the Island before 1066. Assuming it is correct that Domesday ploughlands were a current assessment in or just before 1086, and that hidage assessments were then antiquated (Harvey 1985, 92; Rippon 1994, 242), the calculated figures for acres per *TRE* hide should be relevant for some time in the late tenth or early eleventh century, rather than in 1066 (Margham, 2003, 39-40). There is a wide range of values in the case studies undertaken by Margham (2025, 259-95), from the most productive, the Freshwater Isle at 190 and Brighstone 204 acres per *TRE* hide respectively, through to Bembridge (Brading parish detached) at 790. Middling values can be illustrated by Gatcombe parish 467 and St Helens at 421. These values are dependent upon three factors: the potential of the land determined by the physical background, human agency, and access to more than one landscape region (for example chalk downland and lower-lying clayland). In a similar analysis of tenth-century estates defined by charter bounds the latter was identified as a significant factor in increasing productivity as it permitted access to a range of complementary resources (Margham, 2003, 33-5).

Ploughlands and Hides

The comparison of *TRE* hidage and *TRW* ploughlands was developed by Stephen Rippon (1994, 242; 1997, 176-8):

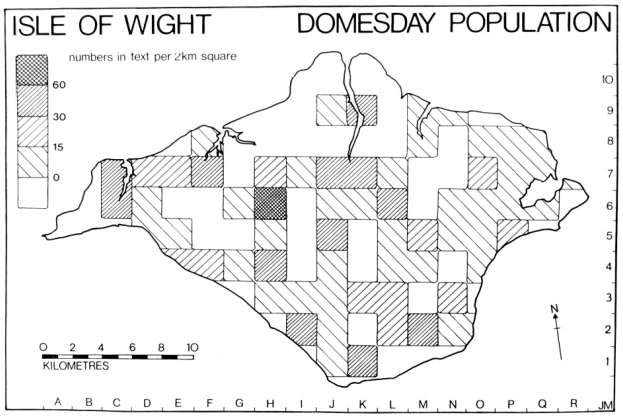
> *'The hypothesis presented here, is that where the eleventh-century ploughland assessment exceeds the older hidage, there may have been an increase in the agricultural productivity of that area, most obviously, an expansion of the cultivated area; this in turn implies late Saxon reclamation'* (Rippon, 1994, 242).

The data from the Island, with 39 manors (30%) having two ploughlands per hide and 19 (15%) having one, suggests a degree of artificiality. Despite this, there is apparent value in making comparisons as both hidage and the number of ploughlands was dependent on soil quality. Assuming that one hide, assessed in the late tenth or early eleventh century, was broadly equivalent to one ploughland assessed in or just before 1086 (Harvey 1985, 92) there was much expansion of arable land-use in the eleventh

century up to the time of Domesday Book. This is particularly marked for clayland manors north of the lateral chalk ridge, such as Briddlesford and Ningwood, and some manors to the south of the ridge, namely Adgestone, Appleford, Sandford and *Scaldeford*. There was no evidence using this analysis for such expansion within the Freshwater Isle, implying the development of its open field system before the hidage assessment was made.

Population- distribution and structure

The recorded Domesday population of the Island was 1,068 (Welldon Finn, 1962, 314). This figure represents heads of households. The population distribution has been presented in map form using 2x2km squares (Map 3: Margham 1989, Fig. 1; 2012, Fig. 1). There are caveats with such a map: the unknown numbers within landholdings administered from mainland manors and the under-recording of individuals. An example of the latter is Alverstone (53) where two ploughlands and a mill were apparently managed by only one bordar! A further issue is that extensive manors were not restricted to an area of 2x2km: the Calbourne village site appears to have a high population density whereas in reality the figures plotted relate to a wider area particularly to the north. The map does, however, give an impression of the relative distribution of the Island's population in 1086, highlighting areas of higher population densities and conversely areas of sparse population such as parts of the northern claylands and the dissected chalk plateau to the west of the Medina.



Map 3: The Domesday population of the Isle of Wight (Margham, 1989 Fig. 1)

Categories of working people can be related to manorial structures. Sally Harvey (1988, 45) wrote that

> *'Relatively little attention has been given to the structure of Domesday manors except by Russian historians, yet the consistent record of both plough-teams in the demesne and of the peasants enables county-wide comparisons'.*

Mention of demesnes (home farms) are to be found in 102 of the 124 Island Domesday Book entries and many of these provide information about population numbers within and outside demesnes. Where specified, the vast majority of villans were to be found beyond demesnes, although there were exceptions such as Lessland and *Witestone* (Hill Farm in Brading) (39v, 53). Some bordars were to be found within demesnes, but predominantly outside, a phenomenon we shall return to below. Slaves were located largely within demesnes, but there were exceptions at Roud, Shanklin, one of the Shide manors and one of the Whitefields (53, 53v).

The role of bordars in 1086 was multifarious (see Carisbrooke case-study below) but

> *'The word may imply a role on the border or edge so perhaps men active in assarting [the taking in of woodland for arable use] and the exploitation of woodland and waste'*
>
> (Higham 1993, 206).

Bordars were associated with substantial areas of population, or active expansion particularly in woodland areas, or both of these (Harvey 1979, 109). A high proportion of bordars associated with areas of such 'colonization' can be supported by evidence from the Isle of Wight. Manors with centres within the northern claylands - Briddlesford, Ningwood, Shalfleet and Watchingwell - have proportions of bordars in excess of 50%. The same is true for the Bembridge area (Brading parish detached) and the two manors within or largely within the Undercliff, Bonchurch and Luccombe, seemingly documenting the development of peripheral areas of the Island in the eleventh century.

Population and Ploughteams

Comparison of recorded population numbers and the number of ploughteams is based on the observation by Darby (1977, 133-4, Fig. 44) that there were significant differences in this ratio between contrasting counties. Analysis of the Island data at a localised scale suggests that manors having access to more than one landscape type (*e.g.* chalk downland and clayland or greensand lowlands) had a relatively high proportion of working people per ploughteam, whereas manors restricted to one lowland landscape type had lower proportions. A tentative conclusion is that manors with four or more people per ploughteam were less dependent on arable agriculture than manors with a ratio of less than three. This was apparently due to having access to other landscape resources such as chalk downland or the dry heathland gravel 'islands' adjoining the Island's north coast where pastoral farming was a significant factor.

Ploughteams and Ploughlands

A comparison of the number of ploughteams and ploughlands on the Island is based on the assertion that the ploughland was used as a unit by which to measure the area of arable in 1086 (Higham 1990, 36). Higham (1990, 42) concluded that

> *'In general terms, there is a broad similarity between areas where the creation of large-scale and often township-wide open fields was early and where Domesday ploughs and ploughlands closely correspond. Conversely, areas where ploughs frequently exceed ploughlands regularly coincide with irregular field systems or systems which were reorganised at a date which could well have been later than 1086.'*

On the Isle of Wight, there is a reasonably equal distribution of the differences between the numbers of ploughlands and ploughteams within individual manors, with (plough)lands greater than ploughs

21%, lands equalling ploughs 28%, lands less than ploughs 24%, and incomplete data 27%. Much of the Island consisted of dispersed settlement in the eleventh century, so perhaps we would expect a higher proportion of manors where ploughlands exceeded the number of ploughs. One of the few areas which would appear to have had a well-developed open field system by 1086 was Freshwater. However, there were 16 ploughlands and only 11 ploughteams. This discrepancy can perhaps be seen as consistent with Higham's observations but the situation in other manors where ploughlands exceeded ploughteams has to be explained.

Kapelle (1979, 166-169) provided an alternative explanation for manors where the number of teams exceeded the number of lands in 1086, which he described as *'overstocked manors'*: 'The obvious inference from the excess team and a half [in Handsworth] is that the arable land of the village had been expanded, not that there was a floating corps of plowmen [*sic*]' (Kapelle 1979,167), and

> *'In these areas [of Yorkshire] the Normans increased agricultural production in an attempt to augment their own wealth by expanding the arable of existing villages and probably by redeveloping nearby waste holdings. This is the meaning of the extra plows [sic]'*
>
> (Kapelle, 1979, 169).

Whilst much of Kapelle's discussion is concerned with the response of landholders to the 'Harrying of the North' by William the Conqueror, it may have a relevance to the expansion of arable agriculture into formerly non-arable areas. This would certainly have been appropriate for manors within the northern claylands of the Island. It may be significant that Briddlesford and Great Whitefield were both apparently 'overstocked' and saw an increase in their value between 1066 and 1086.

Land Use

The statistics for land-use *TRW* can be depicted to enable comparisons and the identification of patterns (Map 4). Domesday Book itemised three categories of land-use: ploughlands (arable), meadow and woodland. Other components of the Island's landscape are known from place-names, environmental and other documentary evidence, but were not mentioned as manorial resources in Domesday Book: These were the extensive wood-pastures and wet heathlands of the northern claylands, and the dry heathlands of the gravel 'islands' adjoining the northern coast and to the south of the lateral ridge in the Hale Common area. The only instance of a deer park was documented in an area of wood-pasture with some meadowland: at Watchingwell (52v)

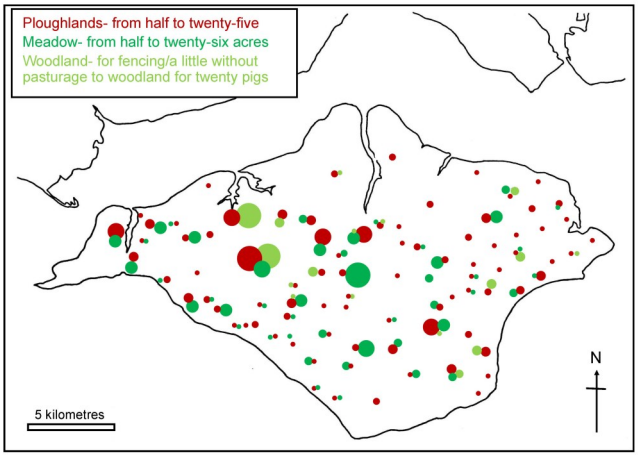
> *'TRE it was assessed at 3 hides; now at 2½ hides, because half [a hide] is in the king's park …. The meadow is in the park'.*

The number of ploughlands reflects the size of manorial holdings, for example in comparing the bishop of Winchester's Calbourne with the profusion of small manors in north-east and south-east Wight. As with other land-uses, symbols have been plotted at manorial centres which may be inaccurate for large manors but plausibly reflect the existence of arable cores not far from these centres which can be demonstrated from later evidence within Freshwater and Calbourne. This may also have been the case at Watchingwell and Whitefield, which were clayland manors with significant numbers of ploughlands, suggesting the development of arable agriculture to complement woodland and heathland resources.

Unlike the plotting of ploughlands, in several instances meadowland would have been located further away from manorial centres. Those of Gatcombe, the largest area at 26 acres (52v), and Appleford, were alongside the Medina, whilst Afton and Freshwater's were nearer at hand along the Western Yar, and Thorley's adjoining the former Thorley Haven. Likewise, Heasley's meadowland would have been alongside the Eastern Yar. Other instances of meadows further from manorial centres were within manors in the area of Wealden Clays adjoining the south-west coast: Brook and Mottistone having the larger areas.



Fig. 2: Hill Farm (Brading parish), on the margins of a gravel plateau, was *Witestone* in 1086. Such locations within the claylands of north-east Wight had populations dominated by villans and few bordars, ratios of ploughteams/ploughlands of one or fewer, and ploughlands/*TRE* hides ratios of about 1.5 implying some expansion of arable during the eleventh century.



Map 4: Recorded ploughlands, meadow and woodland plotted at manorial centres. The mapping of quantities of woodland is problematic due to differing descriptions and measures in the text (Darby 1977, 172-88) so only relative amounts can be plotted.

Woodland was enumerated in terms of pigs or woodland for fencing (above). Substantial areas were to be found within the extensive estates of Calbourne and Shalfleet, with lesser quantities in Watchingwell. The lack of recorded woodland in north-eastern Wight is surprising, as this area is relatively well-wooded in the modern landscape. This may reflect differences in recording of woodland assets between the two halves of the Island (see below - Hundreds: East and West) or woodland beyond manorial demesnes not being recorded. There being no recorded woodland within Bowcombe is also notable, as substantial areas within the northern claylands of this manor would be expected. It is uncertain whether the formerly extensive Parkhurst (Alvington) Forest was established by 1086. If so, this could account for Bowcombe's apparent lack of woodland if this area was not enumerated in Domesday Book (Vicky Basford, personal communication).

Values

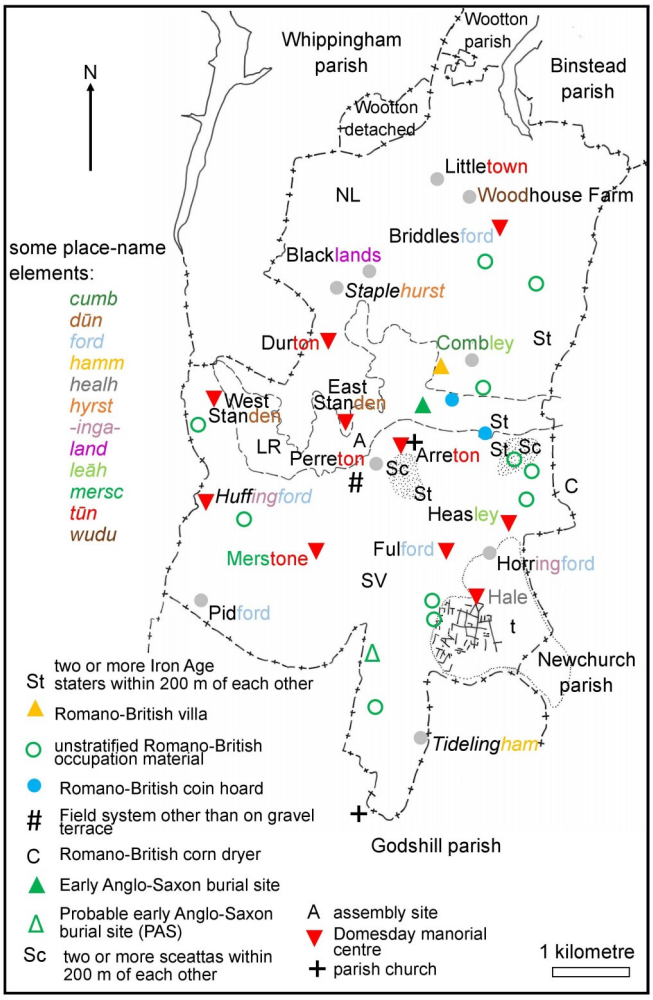
The analysis of changing values between 1066 and 1086 is not straightforward. As Welldon Finn (1973, 82) pointed out

> *'Manors given identical values in Domesday Book display amazing variations in their equipment ... But such details are not necessarily totally illogical. The character of the soil, the richness of the pasture, and the extent and condition of the livestock may have shown considerable variation'.*

On the Isle of Wight, 16% manors saw an increase in value between 1066 and 1086, 41% remained the same, 33% had a decrease in value, and 10% recorded a value for 1086 only. Of the nineteen manors which increased in value, 11 were within the claylands north of the lateral chalk ridge or were manors such as the two Calbourne manors centred on the margins of these two areas. Most of the remaining manors within the northern claylands retained their value, but there are a few exceptions such as Puckpool and Barnsley that declined in value. The situation in the northern claylands can be contrasted with that of the lowlands to the south of the lateral ridge, where from a total of 60 manors within this vale or on its margins, 25 (42%) decreased in value and 24 (40%) retained their value. These statistics indicate that there is a relationship between the changing value of manors and their location in relation to landscape regions.

A Case Study: Arreton parish

The various strands of evidence outlined above can be brought together in a case study of the historic parish of Arreton (Map 5). Twelve Domesday Book entries describe manors within an area of 9,192 acres. The parish as mapped in 1862/3 consisted of 29% clayland to the north of the downs, 19% chalk downland, and 52% greensand vale to the south. The latter also included the gravel terrace alongside the River Yar at Hale Common, 7% of the parish area. The 'productivity' of Arreton parish in the eleventh century was 634 acres per *TRE* hide: the parish was far from being the most productive on the Island, which can be explained by the former presence of extensively-used wet heath and wood-pasture in the



Map 5: Arreton parish- settlement and place-names. The dashed line is the 250ft contour. The stippled areas indicate concentrations of late Romano-British material (Portable Antiquities Scheme). NL- Northern Lowlands (clayland); LR- Lateral Ridge (mainly chalk downland); SV- Southern Vale (mainly lower greensand); t- extensive gravel terrace within the Southern Vale with area of rectilinear crop marks depicted. Sceattas are eighth-century silver coins (Margham 2025, map 8.18).

north, and dry heath and low-lying 'moors' in the south. The four *TRE* hides of Arreton and Heasley's three hides formed the core of the parish, with all other Domesday manors rated at 1½ hides or fewer. The duplications of the names *Huffingford*, Merstone and Standen imply the recent division of these estates in 1066. A significant increase in arable productivity during the eleventh century is suggested by the ratios of ploughlands per *TRE* hide for one of the Standens and *Huffingfords*, Fulford and Hale, and four ploughlands per hide at Briddlesford implying the most expansion in the wet claylands in the north of the parish. More modest expansion can be suggested for Arreton and Heasley. This apparent expansion would also appear to be reflected in the rise in manorial values at Durton and Standen, and the doubling of Briddlesford's value. The ratio of 29:13 for the recorded population to ploughteams at Arreton may signify its diverse agrarian base, accounted for by pasturing on the chalk downland and on the 'moors' of the greensand vale. This observation is compatible with the evidence for irregular field systems (Higham, 1990) or 'overstocked' manors

(Kapelle, 1979) at Arreton, also at Merstone, Fulford and Hale. These manors can be contrasted with the ratio of ploughlands to ploughteams (4:4) within Heasley implying the existence of extensive open fields.

Something of the structure of individual manors can be seen in instances where population figures and ploughteams were enumerated both within and outside demesnes. These can be illustrated by Arreton and Heasley manors. Arreton had three ploughteams and seven slaves in demesne, and 10 ploughteams with 10 villans and 12 bordars beyond. Neighbouring Heasley had two teams and 15 slaves in demesne, and four villans and four bordars outside. The proportion of bordars outside these demesnes suggests that they had a role in the taking in of woodland and wood-pasture to the north of the downland, and of dry heathland to the south. It can be inferred that the villans of these manors had their own landholdings outside the demesnes, whilst owing labour services within to complement the work of the slaves. The most dynamic manor in terms of evidence for expansion was Briddlesford where, as we have seen, there is evidence in Domesday Book for development through the eleventh century which apparently continued up to 1086 with the doubling of its value from *TRE*. The ratio of bordars to villans of 1:1 outside the demesne also supports this scenario. A parallel for this 'clayland colonization' can be cited from Ningwood, where the Domesday place-name *Lenimcode* means

> *'The wood that has been partly enclosed or taken into cultivation'* (Mills, 1996, 76).

Clayland Briddlesford can be contrasted with Hale (53): There is also evidence of arable expansion there during the eleventh century, but this was seemingly outwards from the gravel terrace of Hale Common. The profusion of cropmarks there suggests that this was the arable core within the demesne with its one ploughteam. Expansion of arable land-use onto the adjoining clayland and beyond the demesne can be envisaged, worked by four bordars with a second ploughteam.

Hundreds: West and East

The Isle of Wight was divided into two hundreds (a sub-division of a shire) of approximately similar areas either side of the Medina estuary and river. From the twelfth century these were known as West and East Medine. In 1086, the western half of the Island was known as Bowcombe Hundred, but the name of the eastern half was not recorded. The delineation of these two hundreds *TRW* is not explicit but can be reconstructed from a close examination of the text (Margham, 2013, 8-9). There were also two anomalous hundreds within Bowcombe Hundred:

- *Hemreswell* was a relatively small area consisting of the non-adjacent manors of *Ermud* (Yarmouth), *Soete* (probably Shate in Brighstone) and *Lemincode* (Ningwood) (Kökeritz, 1940, 2).
- Calbourne Hundred in 1086 would appear to be coterminous with the bishop of Winchester's estate as defined in the charter purporting to have dated from 826 (Margham, 2013, 8).

A total of 192 hides were enumerated for the Island *TRE*. Including the hidages of *Hemreswell* and the ecclesiastical hundred of Calbourne, this figure consisted of 110¼ in Bowcombe Hundred and 81¾ of the un-named hundred later known as East Medine. After unhided manors in the eastern half of the Island are taken into account, there would have been a similar number of hides either side of the Medina (Margham, 2013, 13).

The Landscape of Settlement

With the exception of Carisbrooke, the Island's only town in the eleventh century, there is little direct evidence in Domesday Book for types of settlement, whether these be isolated and dispersed or nucleated. However, inferences can be made from the text for rural settlement and of developing settlements that were recognised as towns at a later date, as well as permitting a reconstruction of Carisbrooke's morphology. These will be examined in turn.



Fig. 3: The site of Luccombe farmhouse would have been a manorial centre in the later eleventh century. In 1086 Luccombe was held by King William paying geld for half a hide. There was one ploughland, a ploughteam in the demesne and a recorded population of six bordars and two slaves (39v).

Rural Settlement

Domesday Book is an account of manors rather than individual settlements so provides little evidence of settlement forms. However, many rural settlements would have been small sites. *Celvercote,* now Cheverton in Brading parish, had a recorded population of one bordar and was worth only 5s (53v) and would thus appear to be an example of a small rural settlement as suggested by the *-cote* 'cottage' place-name. An example of a slightly larger settlement is Luccombe with its six bordars and two slaves (39v), although Domesday tells us nothing of how population was distributed within the manor (Fig. 3). It is quite likely that church sites such as Calbourne at an estate centre would have been the focus of some form of settlement nucleation. The Domesday Book entry for the bishop of Winchester's Calbourne itemises 27 villans, 15 bordars and 11 slaves to the north of the chalk ridge. It is inherently very unlikely that all these heads of households were living in the area of the present village and much more plausible that many, in particular villans and bordars, were living to the north of the village with a

scattered settlement pattern akin to that documented in the manorial survey of 1630 (Margham, 2025, 329-39). A similar reconstruction can be made for the south-east Wight area to the south of the Yar and north of the southern chalk downs (Margham, 2025, 339-51). Other inferences can be made through comparing Domesday Book entries with local topography. Gatcombe *TRE* had three sub-tenants who were brothers each occupying a 'hall'. This, along with the recorded *TRW* population of six villans, 15 bordars and six slaves suggests that much of the contemporary settlement was spread out along the 'coombe' here, similar to the irregular two row settlement pattern depicted on the Ordnance Survey map of 1793/4 (52v; Margham, 1985, Fig.4). A similar observation can be made for Wroxall with the manorial centre being within a restricted valley (39v).

The 'Prehistory' of our medieval towns

There is evidence within the folios of Domesday Book that three locations recognised as towns in the twelfth century and later can be seen as 'proto-urban' sites. Newport was formally created by Richard de Redvers 1189x1191 (Bearman, 1994, no. 66). It was apparently founded within the manor of Bowcombe but on the western side of the Medina gap where there were three manors *TRW* all named Shide. William fitzAzor held one of these which had been assessed at 5 virgates *TRE*. It had a recorded population of 15 bordars and 4 slaves (53v), providing a population density of 15 per hide, relatively high for a rural manor. This was then worth 60s, an increase from 40s *TRE*, whilst the adjoining Shide manor held by Joscelin fitzAzor increased from 40s to 50s. These figures may represent development of a settlement soon after the Conquest near or on the later site of Newport. The fitzAzor brothers were also involved in the development of Carisbrooke after the Conquest and would appear to have had commercial interests alongside the Medina.

Yarmouth was founded by Baldwin de Redvers 1180x1186 (Bearman 1994, no. 54) The Domesday Book entry for *Ermud* suggests a typical small rural vill:

> *Ælfric and Wihtlac have 1 hide and 2½ virgates in YARMOUTH [Ermud]. They themselves held it in parage of King Edward. It was then, as now, assessed at 1 hide and 2½ virgates. There is land for 2 ploughs. There are 7 villans and 2 bordars having 2 ploughs. It was worth 12s., now 25s [54].*

However, the area assessed at 1 hide and 2½ virgates is on a very restricted site, with the later parish of Yarmouth comprising 58 acres (Page, 1912, 286) with much of this being the area later known as Yarmouth Common. This high hidage on a relatively small site may suggest that Yarmouth had a function beyond that of a typical rural manor. Its situation on the Solent at the mouth of an estuary may very well have been a landing site with associated service settlement which was reflected in its geld liability and significant increase in value.

Brading was recognisable as a small town from the late thirteenth century when Edward I had granted a market on Wednesdays and a fair lasting for four days (Page, 1912, 159). It is likely that this grant formalised an existing market. It is possible that Brading had a marketing function by the eleventh century with the church there previously having provided a stimulus. The Domesday Book entry for Brading describes a small manor rated at only three parts of a virgate (*i.e.* ¾ virgate) with four bordars held from William fitzAzor by his nephew (53). Two aspects of the Domesday Book entry can be noted: the connection with William fitzAzor as at Shide and Carisbrooke, and the apparent population density, suggesting a small settlement nucleation. Brading as a manor appears to have been subsumed by the neighbouring manor of Whitefield, being referred to as 'Brerding, a member of the king and queen's manor of Whytefeld' at the time of Edward I's market grant (Page, 1912, 158). Inferences from Domesday Book receive support from the observation that eighteenth-century estate maps depict plots within Brading which were held by Whitefield Manor (Basford, 2013, 217). It has been argued that these represent the foundation of Brading as a town by William fitzStur who held both Whitefield manors in 1086 (Webster 1994), but William fitzAzor can also be seen as being instrumental in its development.

The Town of Carisbrooke

Carisbrooke had a castle by 1086. The evidence for this is to be found in the Domesday Book entry for Alvington where

> *'[It was] then [assessed] at 2½ hides; now at 2 hides, because the castle stands on 1 virgate'* (52v)

and Shalcombe belonging to St Nicholas as mentioned above. Carisbrooke was also the site of the only substantial nucleated settlement on the Island. The evidence for this is to be found in the Domesday Book entry for Bowcombe, the record of a toll of 30s and

> *Of the land of this manor William fitzStur holds half a virgate. There is 1 plough with 1 villan. It is worth 10s. Joscelin and William his brother hold 1 virgate, which before them rendered rent; but these men have not paid it.*
>
> *The monks of Lyre hold the church of this manor, with 1 virgate of land.*
>
> *Of this virgate of land Humphrey holds a portion where he has 8 men paying 5s., and William fitzAzor 2½ acres where he has 4 houses. They hold without the consent of the priest. There belong to this church 20 bordars' messuages, and they render 14s (52).*

This information can be analysed through examining what was meant by Bowcombe manor, the location of its church within an extensive enclosure, the significance of the toll, the landholdings of King William's 'new men', and the presence of bordars' messuages belonging to the church. These will be examined in turn before the presentation of a reconstruction of Carisbrooke's topography in 1086.

The manor of Bowcombe encompassed an extensive area, extending from the Bowcombe Valley over much of the area to the north up to the Solent in the eleventh century. Whilst the manorial centre can be identified with Bowcombe Farm, the church and associated settlement were located down the valley in the area later known as Carisbrooke. This spatial

division of 'high status' functions was typical of late Anglo-Saxon England, when the Bowcombe/ Carisbrooke area can be identified as a 'central area' for the Island (Margham, 2025, map 9.9). Carisbrooke church was a 'minster', a superior church responsible for the pastoral care of a large area extending from the Solent to the English Channel before the development of local churches (Margham, forthcoming). A 'minster enclosure' has been identified at Carisbrooke, with a street frontage extending the whole length of the High Street (Margham, 2025, 166-8; Map 6 below) which as Domesday Book tells us included 20 messuages (house plots) belonging to the church.

The only Island manor to record a toll in 1086 was Bowcombe. This reference means that there was a market within the manor. The most plausible location for this would be at Carisbrooke in the shadow of the church, which as a 'minster place' would have attracted commercial activity (Blair, 2005, 505-12). Into this location came William fitzAzor who had four houses on church land. It is quite likely that the church land where Humphrey had a portion with eight men was also here, along with the virgate held by the fitzAzor brothers. This concentration of 'new men' is typical of a Domesday castlery, such as at Clifford and Ewyas Harold in Herefordshire, also associated with William fitzOsbern, where

> *we have specially good examples of the practice of Norman barons by which they assigned to their knightly tenants small estates around their own castles. We find this practice illustrated at Carisbrooke, the chief seat in the Isle of Wight of Earl William FitzOsbern and at Montacute Castle in Somerset.* (Page 1908, 273)

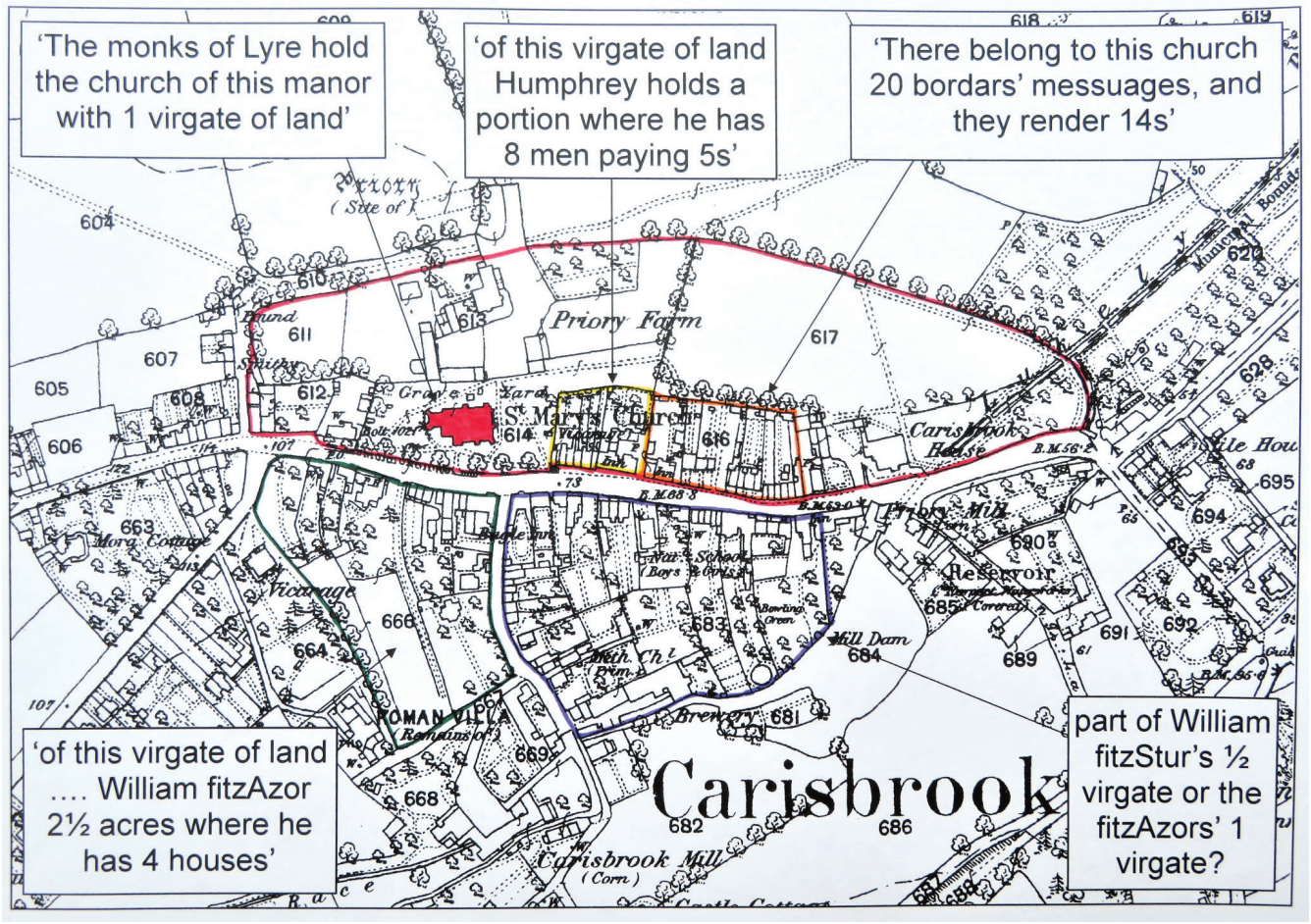
A further strand of evidence is the presence of bordars within a nucleated settlement. Dyer (1985, 100) examined Domesday Book establishing

> *'the existence of numerous cottars and bordars and cottage settlements in and around more than forty early boroughs'.*

He argued that these smallholders aid the identification of urbanisation and urban origins (Dyer, 1985, 102). The number of bordars recorded in the Bowcombe Domesday entry is significant here. A total of 59 villans, bordars and slaves were enumerated, 25% being bordars, some of whom would have been living beyond the confines of Carisbrooke. We can, however, add to this number the 20 bordars' messuages belonging to the church, giving us 35 bordars from a total population of 79. Only Bowcombe has this high proportion of bordars with a specific mention of bordars' messuages in the Isle of Wight Domesday folios.

The information within the Domesday Book entry for Bowcombe can be combined with nineteenth-century mapping by the Ordnance Survey to reconstruct the topography of the town of Carisbrooke in 1086 (Map 6).

The 'minster enclosure' extended the length of Carisbrooke High Street. Within this enclosure there



Map 6: A tentative reconstruction of Carisbrooke in 1086 mapped onto the 1862/3 Ordnance Survey 25-inch survey (Margham, 2025, map 9.7)



Fig. 4: View from Carisbrooke church tower looking eastwards over the messuages of Humphrey's 8 men and the church's 20



Fig. 5: View from Carisbrooke church tower looking southwards over the probable site of William fitzAzor's 4 houses

were 20 bordars' messuages belonging to the church and the portion held by Humphrey with eight men held without the priest's consent. To the south of the High Street William fitzAzor had four houses also held without permission from the church. The map is not intended to be definitive, as can be shown by the uncertainty over who held the block of land to the east of Castle Street. Regardless of exactly where these landholdings of William I's 'new men' were, they can be shown to have had a significant influence in the identification of Carisbrooke as a town. Carisbrooke would have remained the Island's market town until the foundation of Newport in the twelfth century.

From Extensive Estates to Medieval Manors

Domesday Book documents a profusion of manors with a wide range of sizes. It provides us with a snap-shot of a time when extensive estates were being fragmented into smaller manors. This process had developed at differing rates: 'Conservative' Calbourne can be contrasted with the abundance of small manors within the former mother parish of Brading which was also formerly a large estate extending from the Solent to the English Channel (Margham, 2025, 218-9, 226-8). However, even the bishop of Winchester's Calbourne estate had lost territory to smaller independent manors by 1086, in the area to the south of the chalk ridge and nearby Westover, and the un-named sub-holdings such as that later identified as Limerstone were on their way to becoming self-contained manors (Margham, 2024, 13). Other relatively large manors remained in 1086 such as Freshwater and Sandford, but the general trend was towards smaller landholdings. As John Blair (2018, 4) has explained there was a transition from extensive estates

> *'based on established connections between broad ecological zones'* to *'the dynamic exploitation of confined ones'.*

What Domesday Book does and does not tell us

Domesday Book tells us a lot about the Isle of Wight in the eleventh century: landholding, place-names, individual manors and the wider landscape. It informs us about landscape resources, manorial structures and a changing world with the development of individual manors. There are, however, things that it does not tell us: it does not provide a comprehensive record of churches, nor a complete account of the population and of manorial resources such as the woodland of north-east Wight and does not give direct information about the form of settlement. The present paper is offered as a contribution to the study of Domesday Wight, but further analysis is possible, particularly when the text is examined in conjunction with other sources of information from the early medieval and later periods.

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Author: John Margham
email: jnmargham@gmail.com

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THE FOSSIL SERPULIDAE AND SABELLIDAE FROM THE ISLE OF WIGHT: PART 3 PALEOGENE SERPULIDAE

Dr Martin C. Munt

Abstract: *Ten species of serpulid worm tube from the Paleogene of the Isle of Wight are described and figured. Both attached and unattached forms are present. They are mostly from marine shallow water clays and muddy sands, but include a potentially brackish/freshwater taxon. Most species are stratigraphically restricted; however, some forms occur in high abundance.*

Keywords: Serpulidae, Paleogene, Isle of Wight.

Introduction

Comprising the third part of a series documenting records of fossil 'serpulid' worms from the Isle of Wight, herein are those from the Paleogene rocks which form the northern part of the Island. These taxa have received almost no attention since they were originally named beginning with Solander (1766), Mantell (1822) and the Sowerby brothers between 1812 and 1845. The most common taxa are figured in Todd and Parfitt (2017) and in previous editions of that publication. Besides the overview of European serpulids by Rovereto (1904), and those from the Priabonian of Germany by Oppenheim (1901), the only comprehensive study of the British taxa is that of Wrigley (1951), which predates the major revisions of Upper Cretaceous forms by Regenhardt (1961), Lommerzheim (1979) and Jäger (1983). However, Wrigley seems not to have considered the progress made by Brűnnich Nielsen (1931). Nevertheless, Wrigley covers all the recognised taxa from the British Eocene. Based upon the unpublished catalogues of the Isle of Wight Council Geological Collection, previous curators documenting the collection have assigned serpulid finds to those recognised by Wrigley (1951), including specimens from strata that would then have been considered Oligocene in date. With little progress in over two hundred years there is high potential for undescribed taxa from the British Paleogene.

Contrary to those of the deep water Late Cretaceous Chalk, the serpulids of the Paleogene are mostly from marine shallow water clays and muddy sands, including a potentially brackish/ freshwater taxon. Most species are stratigraphically restricted, but forms such as the simple tubes of *Ditrupa plana* occur in high abundance concentrations.

Having been stable since the middle of the nineteenth century, the stratigraphic nomenclature of the British Eocene and Oligocene underwent quite radical revision, beginning in the 1980s. Herein, we follow the most recent revision, that of King (2016), simplified versions of which can be found in Todd and Parfitt (2017) and Gale (2019). However, most of the specimens in this study were collected prior to the current nomenclature and therefore are adjusted where practicable to match present terminology.

Institutional abbreviations: IWCMS = Isle of Wight Council Museum Service. MIWG = Museum of Isle of Wight Geology.

Species Descriptions

Phylum ANNELIDA Lamarck, 1809

Class POLYCHAETA Grube, 1850

Subclass SEDENTARIA Lamarck, 1818

Infraclass CANALIPALPATA Rouse and Fauchald, 1997

Order SABELLIDA Dales, 1962

Family SERPULIDAE Rafinesque, 1815

Subfamily SERPULINAE Rafinesque, 1815

Genus SERPULA *s.l Linnaeus*, 1758

*Serpula*_cf *flagelliformis* J. de C. Sowerby, 1844 Fig. 1 *Description*. Small up to 20 mm in length, and typically less than 2 mm in diameter. The tube is round and thin walled, with numerous closely set growth lines and occasional swellings. It is attached for the entire length. It increases in size gradually and is sinuous and recurved. The inner tube is round.

Remarks. Found as individual tubes attached to shells.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group.

Material. 'Brook Bed', Selsey Formation, Bracklesham Group: MIWG. 2485 Whitecliff Bay.



Fig. 1: *Serpula* cf *flagelliformis* J. de C. Sowerby, 1844. 'Brook Bed', Selsey Formation, Bracklesham Group. Whitecliff Bay. MIWG. 2485. Attached to the wing of a shell of *Pterynotus* sp. Scale bar: 10mm.

Serpula tenuis J. de C. Sowerby, 1829 Fig. 2–3

Description. Small and narrow, up to 50mm in length. The tube is cylindrical and thin with a single minute carina. It is smooth with occasional very faint growth lines and typically a single abrupt swelling. Some individuals have a single flange. Found in small to large groups of individuals isolated or fixed together, straight or curved.

Remarks. Commonly found in the marginal marine parts of the Solent Group. Notably forming mounds within the basal part of the Gurnard Member at Howgate Bay. In parts of the Headon Hill Formation, it occurs with freshwater molluscs.

Occurrence. Priabonian: Colwell Bay Member, Headon Hill Formation, and Gurnard Member, Bouldnor Formation, Solent Group. Rupelian: Cranmore Member, Bouldnor Formation Solent Group.

Material. Colwell Bay Member, Headon Hill Formation: MIWG. 3548 and MIWG. 1998 *Neritina* Bed, MIWG. 1134 Oyster Bed, Colwell Bay, Isle of Wight. Gurnard Member, Bouldnor Formation: MIWG. 2158 Whitecliff Bay. Gurnard Member, Bouldnor Formation: IWCMS: 2025.7 Black Rock Ledge. Cranmore Member *Corbula* Bed: MIWG.1246 Bouldnor.



Fig. 2: *Serpula tenuis* J. de C. Sowerby, 1829. '*Neritina* Bed', Colwell Bay Member, Headon Hill Formation. Colwell Bay. MIWG. 3548. Scale bar: 10mm.

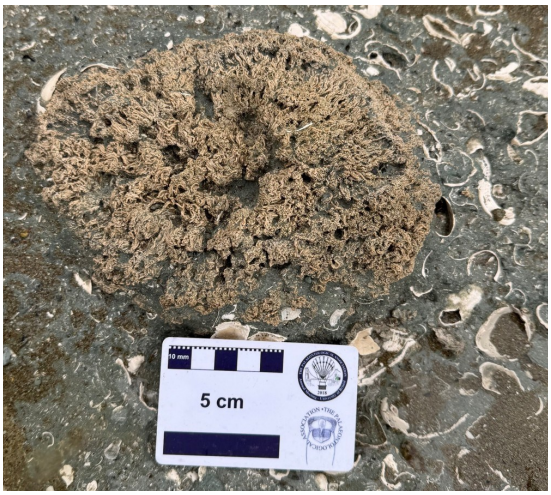

Fig. 3: *Serpula tenuis* J. de C. Sowerby, 1829. Gurnard Member, Bouldnor Formation. Black Rock Ledge, Bembridge. IWCMS: 2025.7. Shows radiating individuals forming a small mound. Scale bar: 50 mm.



Fig. 4: *Serpula* sp. Gurnard Member, Bouldnor Formation. Locality unknown, but presumably Howgate Bay, Bembridge. MIWG. 839. Scale bar: 10mm.

Serpula sp. Fig. 4

Description. Small, forming knot-like colonies approximately 10-15mm across. Both the inner and outer surfaces of the tube are round; the growth habit is convoluted. The surface is smooth with irregular swellings and moderate growth lines.

Remarks. These closely formed knots occur approximately four metres above the base of the Gurnard Member in Howgate Bay.

Occurrence. Priabonian: Gurnard Member, Bouldnor Formation, Solent Group.

Material. Gurnard Member, Bouldnor Formation, Solent Group: MIWG. 839 Locality unknown: Isle of Wight, IWCMS 2020.430 Howgate Bay.

Genus PYRGOPOLON de Montfort, 1808

Formerly SCLEROSTYLA Mørch, 1863

Pyrgopolon sp. Fig. 5-6

Description. Medium sized, up to 25mm in length. Superficially triangular in section with a strong carina on the axis of the tube. The growth lines are strong and irregularly spaced. The inner tube is round. Flattened attachment area. Attached for the full length. *Remarks*. Typically attached to the surfaces of dead shells.

Occurrence. Priabonian: Gurnard Member, Bouldnor Formation, Solent Group. Rupelian: Cranmore Member, Bouldnor Formation Solent Group.



Fig. 5: *Pyrgopolon* sp. Gurnard Member, Bouldnor Formation. Black Rock Ledge, Bembridge. IWCMS: 2025.6.1. attached to the surface of a broken shell of *Ostrea vectensis*. Scale bar: 10mm.



Fig. 6: *Pyrgopolon* sp. Cranmore Member, Bouldnor Formation, Solent Group. Bouldnor Cliff. MIWG. 2116. Attached to a shell of *Granulolabium plicatum*. Scale bar: 30mm.

Material. Gurnard Member, Bouldnor Formation, Solent Group: MIWG. 1948 Whitecliff Bay. Gurnard Member, Bouldnor Formation: IWCMS: 2025.6.1-6. Black Rock Ledge, Bembridge. Cranmore Member, Bouldnor Formation, Solent Group: MIWG. 2116 Bouldnor Cliff.

Pyrgopolon mellevillei (Nyst and Le Hon, 1862) Fig. 7

Description. Medium sized, up to 20 mm in length, straight or recurved. Outer surface with seven carinae which have an irregular pattern of nodes. Periodically, the tube is crossed by strong ridges which mark former hiatuses of growth at irregular intervals. The inner tube is round. The operculum is funnel shaped and its disc radiated.

Remarks. This taxon has undergone some revision (see Read and Fauchald *The World Polychaeta Database*. (https://www.marinespecies.org/polychaeta) and includes material previously assigned to *Sclerostyla gallica* Wrigley, 1951= *Pyrgopolon gallica* (Wrigley, 1951) and *Serpula heptagona* von Hagenow, 1840.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group.

Material. Fisher Bed xvii, Selsey Formation, Bracklesham Group: MIWG. 2307 Whitecliff Bay.



Fig. 7: *Pyrgopolon mellevillei* (Nyst and Le Hon, 1862). Fisher Bed xvii, Selsey Formation, Bracklesham Group. Whitecliff Bay. MIWG. 2307. Scale bar: 30mm.

Tribe FICOPOMATINI Pillai, 1960

Genus DITRUPA Berkeley, 1835

Ditrupa bartonensis Wrigley, 1951 Fig. 8

Description. Small thin gently curved tubes up to 20 mm in length. The outer surface is tube is smooth, the inner surface of the tube is round.

Remarks. Occurs in crowded masses of individuals.

Occurrence. Bartonian: Barton Clay Formation ('Middle Barton Beds'), Barton Group.

Material. 'Middle Barton Beds', Barton Clay Formation, Barton Group: MIWG. 1082 Alum Bay.

Ditrupa plana (J. Sowerby, 1815) Fig. 9

Description. Small up to 15 mm in length, gently tapering and curving individual tubes. The outer surface is smooth. The inner tube surface is round, and the aperture is slightly thickened. Found in crowded masses.

Remarks. Small specimens are abundant in the Tilehurst Member (Harwich Formation, Thames Group) which was formerly known as the London Clay Basement Bed, at Whitecliff Bay, and Alum Bay.

Occurrence. Ypresian: Tilehurst Member, Harwich Formation, Thames Group.

Material. 'London Clay Basement Bed', Tilehurst Member, Harwich Formation, Thames Group: MIWG. 481 Alum Bay, MIWG. 5775 Whitecliff Bay.



Fig. 8: *Ditrupa bartonensis* Wrigley, 1951. 'Middle Barton Beds', Barton Clay Formation, Barton Group. Alum Bay. MIWG. 1082. Scale bar: 50mm.



Fig. 9: *Ditrupa plana* (J. Sowerby, 1815). 'London Clay Basement Bed', Tilehurst Member, Harwich Formation, Thames Group. Whitecliff Bay. MIWG. 5775. Scale bar: 10mm.

Subfamily FILOGRANINAE Rioja, 1923

Genus PROTULA Risso, 1826

Protula extensa (Solander, 1766) Fig. 10 - 11

Description. Large, thick shelled, up to 250 mm in length, and 8 mm in diameter. The tube is almost straight but with occasional kinks. The surface is smooth but faintly corrugated, with numerous nearly equal growth lines. The inner tube is round and is unattached.

Remarks. The largest tube worm from the British Eocene. Occurs singly and in crowded masses.

Occurrence. Lutetian: Selsey Formation, Bracklesham Group. Bartonian: Barton Clay Formation ('Middle Barton beds'), Barton Group.

Material. 'Brook Bed', Selsey Formation, Bracklesham Group: MIWG.1259 Whitecliff Bay. 'Upper Bracklesham', Bracklesham Group: MIWG. 523a Gunville, Newport. 'Middle Barton Beds', Barton Clay

Formation, Barton Group: MIWG. 2043 Alum Bay. 'Middle Barton Beds', Barton Clay Formation, Barton Group: MIWG.6173 Alum Bay. 'Barton Beds': MIWG. 4752 Alum Bay.



Fig. 10: *Protula extensa* (Solander, 1766). Upper Bracklesham', Bracklesham Group. Gunville, Newport. MIWG. 523a. Block containing numerous individuals. Scale bar: 50mm.



Fig. 11: *Protula extensa* (Solander, 1766). 'Middle Barton Beds', Barton Clay Formation, Barton Group. Alum Bay. MIWG. 2043. Scale bar: 50mm.

Family SPIRORBIDAE Chamberlin, 1919
Subfamily SPIRORBINAE Chamberlin, 1919
Genus ROTULARIA Defrance, 1827
Rotularia bognoriensis (Mantell, 1822) Fig. 12-14
Description. Medium sized, with the main disc typically 15 mm in diameter, after five coils the tube becomes straight with irregular swellings. The discoidal part is concave underneath. The outer tube has broad, rounded longitudinal carinae, the inner surface is round.
Remarks. Highly distinctive tube found in the London Clay.
Occurrence. Ypresian: London Clay Formation, Thames Group.
Material. London Clay Formation, Thames Group: MIWG. 6029 Whitecliff Bay, and MIWG. 6131 Alum Bay.



Fig. 12: *Rotularia bognoriensis* (Mantell, 1822). London Clay Formation, Thames Group. Whitecliff Bay. Whitecliff Bay. MIWG. 6029. Block containing individuals. Scale bar: 10mm.



Fig. 13: *Rotularia bognoriensis* (Mantell, 1822). London Clay Formation, Thames Group. Alum Bay. MIWG. 6131. Single disc. Scale bar: 10mm.

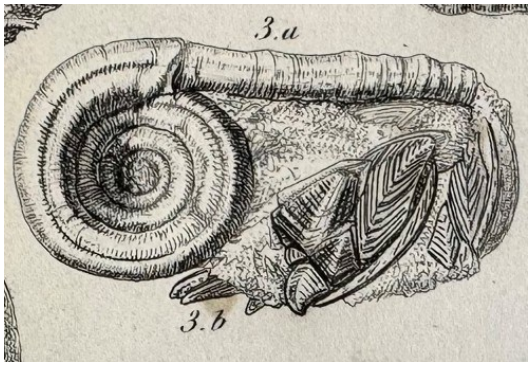

Fig. 14: *Rotularia bognoriensis* (Mantell, 1822). London Clay Formation, Thames Group. Bognor, West Sussex. After Dixon (1850, Tab. XIV fig.3a) engraving J. de C. Sowerby. Shows complete individual. The discoidal part is typically 12-15mm in diameter.

Tribe SPIRORBINI Chamberlin, 1919
Genus SPIROBIS Daudin, 1800
Spirorbis exigua (J. de C. Sowerby, 1844) Fig. 15
Description. Small up to 8 mm in height, turbiniform. Expanding, irregular coil with numerous regularly spaced coarse ridges.
Remarks. Sowerby (1844) records specimens as being minute and attached to shells of naticid gastropods from the Barton Clay.

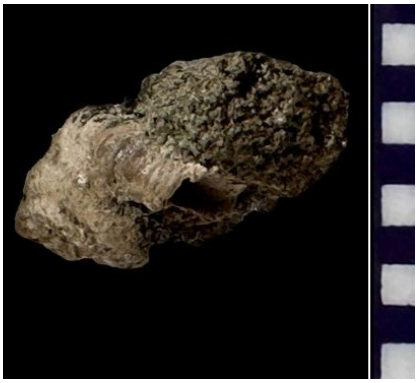

Fig. 15: *Spirorbis exigua* (J. de C. Sowerby, 1844). Fisher Bed iv, Wittering Formation Bracklesham Group. Whitecliff Bay. MIWG. 1789. Scale bar: 10mm.

Occurrence. Ypresian: Wittering Formation, Bracklesham Group. *Material*. Fisher Bed iv, Wittering Formation Bracklesham Group: MIWG. 1789 Whitecliff Bay.

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Author: Dr Martin Munt, Curator, Dinosaur Isle Museum, Culver Parade, Sandown, Isle of Wight, PO36 8QA.

email: martin.munt@iow.gov.uk

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A UNIQUE STRATIFIED OCCURRENCE OF *Plagiolophus minor* FROM THE LATE EOCENE, GURNARD MEMBER OF HOWGATE BAY, ISLE OF WIGHT

Martyn C G Hornett

Abstract: *In 2022, a partial mandible of Plagiolophus minor was discovered in-situ from the Gurnard Member (Solent Group) of Howgate Bay, Isle of Wight. This represents the first recorded in-situ large mammal fossil from this part of the Late Eocene succession, which has otherwise yielded sparse and poorly documented ex-situ mammal remains. Stratigraphic logging and sedimentological analysis indicate that the mandible was preserved within an anoxic substrate under brackish water conditions.*

Keywords: Mammal, *Plagiolophus*, Palaeothere, Eocene, Isle of Wight.

Introduction

A partial mandible of *Plagiolophus minor* (Cuvier, 1804) consisting of the right and left dentaries was found within the lower part of the fossil-rich, Late Eocene Gurnard Member (Solent Group) in Howgate Bay (SZ 647 868) on the Isle of Wight. *Plagiolophus minor* which was the size of a modern roe deer (*Capreolus capreolus*), is found at several sites in Europe, and was the only member of the Palaeotheriidae to survive the "Grande Coupure" faunal turnover into the Oligocene (Jehenne and Brunet, 1992). The diet of *Plagiolophus minor* was discussed by Remy (2004) based on the gross morphology of the teeth and qualitative mesowear suggesting that *P. minor* fed on both soft foliage and more abrasive grasses.

Further study by Joomun *et al.* (2008) determined that the species was a leaf browser, with a small proportion of the diet consisting of soft fruit and consumed fewer abrasive foods than other palaeotheres. Perales-Gogenola *et al.* (2022) showed that despite the wide chrono-spatial distribution of *Plagiolophus* sp. their diet did not fundamentally change between the middle Eocene and the early Oligocene. Their research concluded that *Plagiolophus* was a highly selective feeder that concentrated on a few plants with tough leaves that required a slicing motion, and they would have avoided lignified or hard material that required a crushing action.

Howgate Bay is located on the north-east coast of the Isle of Wight. The Gurnard Member is a heterolithic succession comprising a series of well-bedded clays, marls and subordinate limestones of both quasi-marine and terrestrial origin. They yield a diverse mollusc, fish, reptile, and vertebrate fauna, which has been recorded by many researchers, including Webster (1814); Forbes (1853); White (1921); Daley and Edwards (1971, 1990); and Gale (2021). However, relatively few larger mammalian specimens have been reported from within the Gurnard Member. Of these, the majority originate from the coast between Thorness Bay and Yarmouth, 32 km west of Howgate Bay. Hooker (2010) recorded small mammal teeth from the Bembridge Oyster Bed and the underlying clays in Howgate Bay. The only other accurately horizoned mammalian fauna (recorded at Dinosaur Isle Museum) come from a sandy limestone bed (bed G9B) and overlying muds, (bed G10) of Hooker (2021) which were studied by Ford, Ensom and Bosma in the 1960s and 1970s. That mammal fauna comprised microfossils found by sieving. Therefore, very few large mammalian taxa are known from the Gurnard Member with most specimens in museums from the early 20th century simply recorded as being from the "Isle of Wight". According to Hooker (2010), the majority of finds of large mammals all appear to have come from the top of the Gurnard Member close to the Black Band (the base of the overlying Hamstead Member) and of those finds, only one was apparently found *in-situ*. Records of finds in the Dinosaur Isle Museum collection in Sandown are like that of the Natural History Museum in London. Therefore, this paper reports, for the first time the finding of an in-situ large mammal fossil from the lower part of the Gurnard Member.

Geological Setting of the Gurnard Member

The Eocene sediments of Whitecliff and Howgate Bays have been investigated by several researchers including Daley (1972, 1973a, 1973b, 1999); Daley & Edwards (1974, 1990); Keen (1977); Collinson (1983); Hooker *et al*. (1995), who identified a range of depositional environments, including marginal marine, brackish lagoon, coastal lake and floodplain lake settings. The relative position of the land and sea was changing in response to movements in sea level, and continuing uplift of the Isle of Wight monocline, (Parrish *et al*., 2018). The consequence of these changes were depositional fluctuations which resulted in the sediments being deposited in the Howgate Bay area as sometimes marginal marine and at other times non-marine (Hooker *et al*., 1995).

Within Howgate Bay, the lowest Gurnard Member sediments are now considered a transgressive surface, formed under sub-tropical conditions, which thins northwards and onlaps older sediments. The bulk of the Gurnard Member was deposited in this regressive phase when continental conditions were gradually re-established (Gale, 2019). It is probable that the Solent area was a distal part of a river, as sedimentation in the Gurnard Member reflects deposition in a sluggish-water estuary or lake. The lack of fluvial sediment implies that the local landscape remained low, with stable, densely vegetated surfaces during late Priabonian times (Hooker *et al*., 1995). The marginal marine environment is represented by the Bembridge

Oyster Bed (Forbes, 1856, King, 2016) which contains abundant *Ostrea*, generally as drifted, separated valves and shell debris. Studies of ostracods (Keen, 1966), Foraminifera (Bhatia, 1955) and barnacles (Gale, 2020) support the existence of brackish or saline conditions. This marginal marine environment was superseded by a lagoonal environment. These sediments are predominantly blue-grey clays, homogeneous or with varve-like lamination containing a brackish fauna, dominated by the bivalve *Polymesoda*. It is from the higher-level beds of this estuarine environment that the *Plagiolophus* mandible was recovered. Within these facies, there is a shell bed at the base of Bed G4, which in places is heavily cemented with pyrite and persists across the study area. The bed was a good marker horizon for this study and is therefore numbered Bed G4a (Table 1).

This bed has yielded several well-preserved turtles (family Trionychidae), which are now in the Dinosaur Isle Museum collection. The top of the recorded section is characterized by knots of serpulid worm tubes, which probably represent a short-lived saline inundation during a period when fully freshwater conditions were established over the area. The Gurnard Member above the serpulid bed is outside the scope of this study, but is interpreted as representing deposition in extensive, low-lying, floodplain lakes which were periodically incorporated into a river system. The environment is characterized by freshwater gastropods, and occasionally the bivalve *Unio* and the sediments are olive-brown clays, with some horizontal lamination (Daley, 1972).

Methods

Fieldwork in Howgate Bay was possible thanks to permission from the Isle of Wight Council. Specimens were deposited at Dinosaur Isle Museum (Sandown, IOW, UK) under the collection number IWCMS: 2025.8.

Examination of the dentaries was carried out under a binocular microscope to determine if there was any bone modification by weathering, abrasion, trampling, carnivore or rodent activity.

The Gurnard Member is well exposed in Howgate Bay, and the lower six meters of the Member were logged for this paper using direct bed measurements. The numbering sequence for the beds is based on Hooker (2021) and Daley (1973). Identified within the presented stratigraphical framework is the horizon that produced the partial mandible discussed and figured here (Table Institutional abbreviation: IWCMS = Isle of Wight Council Museum Service.

Systematic Palaeontology

Order PERISSODACTYLA Owen, 1848b

Suborder HIPPOMORPHA Wood, 1937

Family PALAEOTHERIIDAE Bonaparte, 1850

Genus *Plagiolophus* Pomel, 1847

Plagiolophus minor (Cuvier, 1804)

Description of the material

A partial mandible (Fig. 1) missing the anterior portion of both dentaries containing the incisor / canine teeth. The left dentary is missing the coronoid process and condyle. The right dentary retains most of the coronoid process, but is missing the condyle. Both the left and right dentaries have a mandibular tooth row consisting of the P_2-P_4 and M_1-M_3 teeth *in*

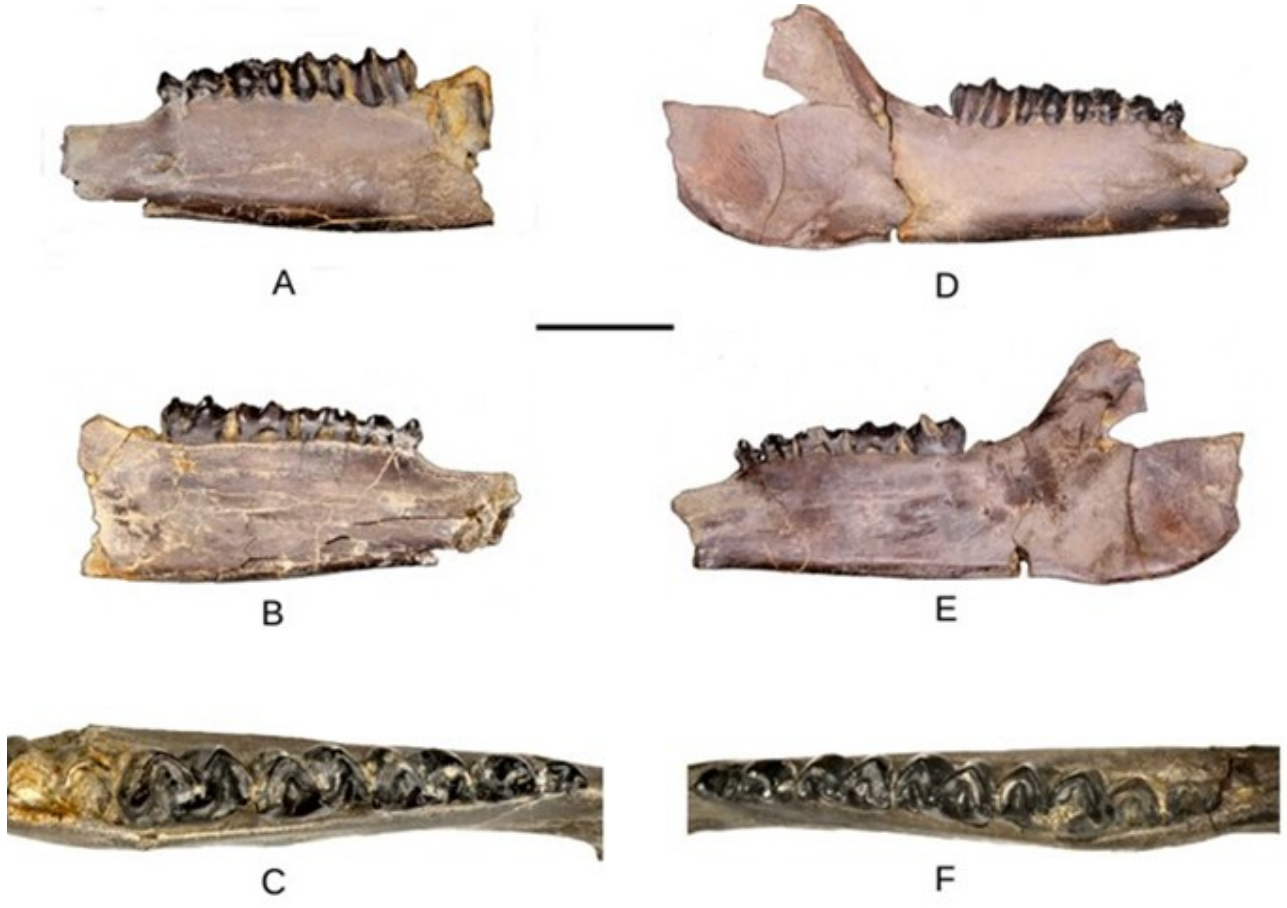
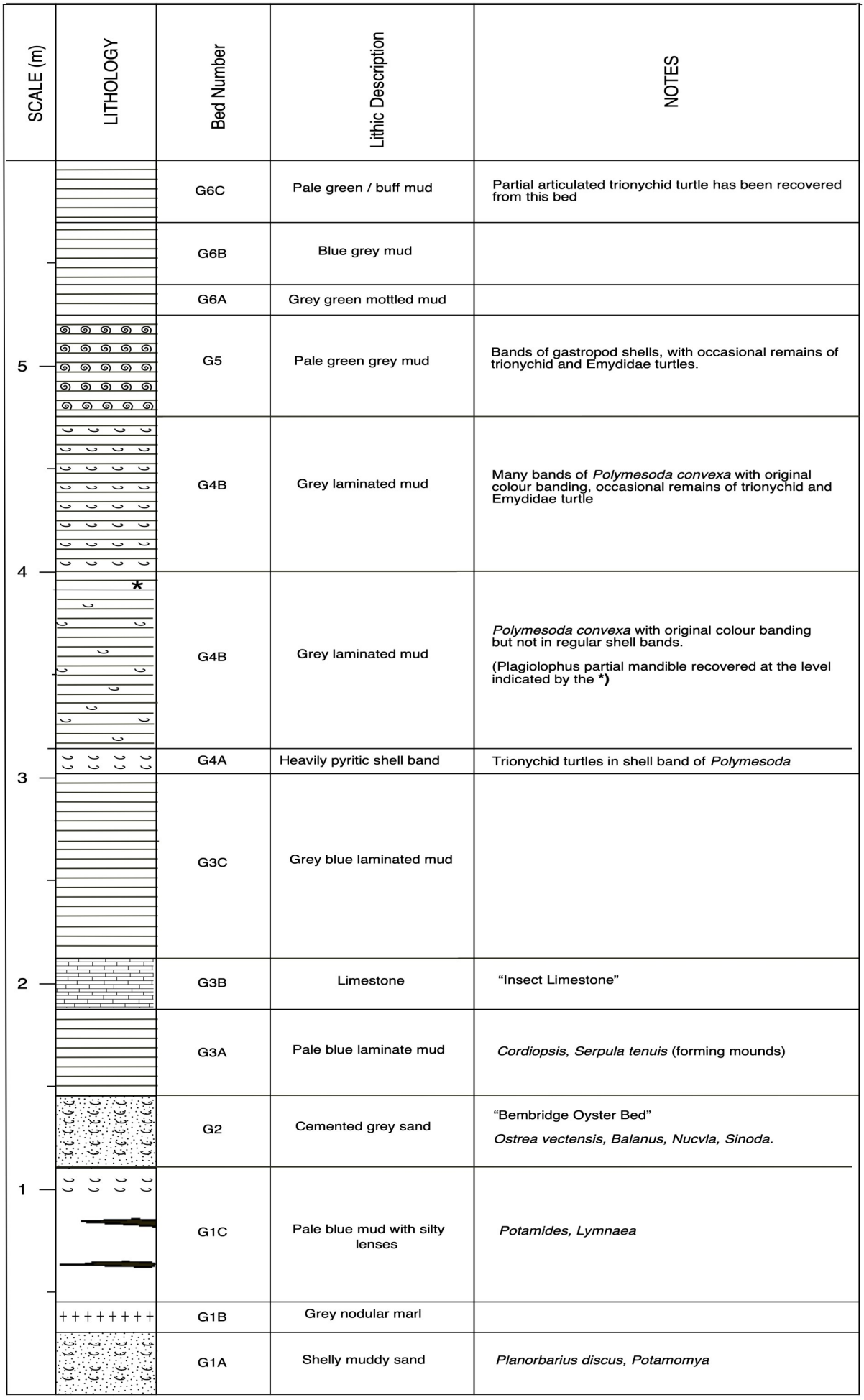


Fig. 1: *Plagiolophus minor:* Left dentary in A: Buccal View. B: Lingual View. C: Occlusal View. Right Dentary in D: Buccal View. E: Lingual View. F: Occlusal View. Scale bar for A, B, D and E = 30mm. Scale bar for C and F = 20mm

Table 1: A refined sedimentary Log of the Lower Gurnard Member in Howgate Bay (647 868), based on original field observations and the work of Hooker (2010) and Daley (1973).



Bed Number	Lithic Description	NOTES
G6C	Pale green / buff mud	Partial articulated trionychid turtle has been recovered from this bed
G6B	Blue grey mud	
G6A	Grey green mottled mud	
G5	Pale green grey mud	Bands of gastropod shells, with occasional remains of trionychid and Emydidae turtles.
G4B	Grey laminated mud	Many bands of *Polymesoda convexa* with original colour banding, occasional remains of trionychid and Emydidae turtle
G4B	Grey laminated mud	*Polymesoda convexa* with original colour banding but not in regular shell bands. (Plagiolophus partial mandible recovered at the level indicated by the ***)**
G4A	Heavily pyritic shell band	Trionychid turtles in shell band of *Polymesoda*
G3C	Grey blue laminated mud	
G3B	Limestone	"Insect Limestone"
G3A	Pale blue laminate mud	*Cordiopsis*, *Serpula tenuis* (forming mounds)
G2	Cemented grey sand	"Bembridge Oyster Bed" *Ostrea vectensis, Balanus, Nucvla, Sinoda.*
G1C	Pale blue mud with silty lenses	*Potamides, Lymnaea*
G1B	Grey nodular marl	
G1A	Shelly muddy sand	*Planorbarius discus, Potamomya*

situ (Fig 1). In occlusal view the M_1 and M_2 comprise two main crescent shaped lobes which are rounded and concave on the lingual side, with the occlusal surfaces inclined slightly anteriorly. In both dentaries, the M_3 has not fully erupted and remains wholly within the alveolus. In the right dentary the M_3 is complete and in occlusal view the hypoconulid forms a third crescent shaped lobe. In the left dentary the posterior part of the M_3 is missing; consequently, in occlusal view only two crescent-shaped lobes are seen.

The structure of the P_2 is small and unicuspid. In occlusal view P_3 has a single crescent shaped lobe and the P_4 is molariform with two crescent shaped lobes, again with the occlusal surface inclined slightly anteriorly. The length of the mandibular tooth row is 63mm, and whilst neither dentary have the canine teeth preserved the left dentary has the remains of the canine tooth alveolus. The estimate of the post-canine diastema length is 21mm, this measurement shows a moderately elongated diastema. The Premolar-Molar Index (PMI: P_2-P_4/M_1-M_3x100 length ratio) in this specimen is 57.8% (P_2-P_4=23.5, M_1-M_3=40.6)

Discussion

The measurements of the mandibular tooth row (63mm) are consistent with *Plagiolophus minor* (60 to 70mm) *as* reported by Remy (2004). Furthermore, the 21mm estimate for the post-canine diastema shows it to be moderately elongated and is consistent with being 30% of the mandibular tooth row length, as also reported by Remy (2004) for *Plagiolophus minor*. The PMI for the specimen is 57.8% which is low when compared to *Paleotherium* (62-82%) but is within the range for *Plagiolophus minor* (44-59%). Remy (2004) described a progressive lowering of this ratio over time but also recognised a high variability in this index between individuals.

Remy (2004) reported that juvenile dental fossils are rare; consequently, it is difficult to reconstruct the precise dentition stages. However, from his investigations the sequence of appearance of permanent teeth in *Plagiolophus* is probably M_1-M_2-P_2-(P_3 and P_4)-M_3 in both the mandible and the maxilla. Therefore, as the M_3 tooth has not fully erupted in this specimen this indicates that it is from a sub-adult and that all teeth are permanent.

Taphonomy

The bed from which the *Plagiolophus minor* mandible was recovered was deposited aqueously, as indicated by the presence of bivalves, gastropods and teleost fish remains (Table 1). Voorhies (1969) recorded that skull and mandible material are usually only moved by high-velocity currents, as they have a low surface area to volume ratio. However, as only a partial mandible has been recovered it is impossible to infer water current or movements.

Bone deterioration due to weathering is indicative of time elapsed between the death and final burial. Behrensmeyer, (1978) constructed a weathering scale based on the study of modern bones at Amboseli National Park (Kenya), which is characterised by a tropical, semi-arid climate, probably like that during Gurnard Member times. Therefore, the weathering scale estimated at Amboseli National Park can be applicable to this study. Behrensmeyer (1978) measured on a scale from 0 (not weathered) to 5 (extremely weathered), where each category relates to the number of years since death: Stage 0 (0-1 yr), Stage 1 (0-3 yr), Stage 2 (2-6 yr), Stage 3 (4-15 yr), stage 4 and Stage 5 (6-15 yr). With only superficial longitudinal cracking of the bone and no flaking of the outer surface, our specimens show a level of weathering consistent with stage 1.

Abrasion refers to erosion caused to bones by means of friction with sedimentary particles. To analyse abrasion, I have used the three stages proposed by Alcalá (1994): intact bone (Stage 1), rounded bone (Stage 2) and polished and smoothed bone (Stage 3). The abrasion stage can be used as a proxy for the either the intensity or length of time the bones interact with sediment particles. However, the degree of abrasion does not necessarily indicate distance of transport (Behrensmeyer, 1991). Examination of the bones shows that they are intact with no indication of erosion. The specimen has substantial pyrite growth within the bone structure which indicates that fossilisation occurred under anoxic conditions. This, in combination with little sign of abrasion, confirms rapid burial.

The specimen has breaks at the junction between the dentary and the anterior portion of the mandible containing the incisor / canine teeth, and between the dentary and the coronoid process. It is not usually possible to identify with certainty the agent of breakage. However, as the observed breakages are not spiral or saw-toothed fractures, they are unlikely to have occurred whilst the bones were fresh, and collagen rich. This makes it unlikely that the breakages were the result of postmortem trampling (Lyman, 1994). The breaks are therefore more likely to have occurred post fossilisation and probably happened when the bones were exposed to the action of the sea prior to discovery. Further examination of the bones also shows no indication of carnivoran or rodent activity. It can be inferred that the specimen was not exposed to weathering or abrasion for any extended period prior to burial. Combined with no evidence of postmortem damage by trampling or activity by carnivores or scavengers it is hypothesised that the bones were rapidly buried in a subaqueous, anoxic environment.

Conclusion

As finds from the Gurnard Member are typically fragmentary and found *ex-situ*, the palaeobiodiversity of the larger terrestrial mammals remains poorly known. Along with the paucity of detailed literature, identification can be difficult. Howgate Bay is not as rich in large fossil mammal remains as other Isle of Wight sites and has therefore historically not been so extensively studied. Moreover, Hooker (2010) noted that the majority of recorded large mammal finds appear to have come from the very top of the Gurnard Member which is eroded out at Howgate Bay. Historically poor recording of specimen locations does not preclude some fossils in museum collections as being from Howgate Bay. The find reported in this paper demonstrates that the lower

Gurnard Member in Howgate Bay does have rare identifiable mammal remains. Therefore, more focussed collecting from Howgate Bay should lead to the discovery of more *in-situ* finds which in turn will help refine our understanding of both the environment and palaeoecology of the site.

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Author: Martyn C G Hornett
Volunteer at Dinosaur Isle Museum, Culver Parade, Sandown, Isle of Wight, PO36 8QA.
Email: hornettsnest@aol.com

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A FORGOTTEN ANTIQUARIAN – WILLIAM TUCKER STRATTON (1825-1899)

John Matthews

Abstract: *William Stratton was an architect and historian of the Isle of Wight. He produced the first guide to Carisbrooke Castle.*

Keywords: William Stratton, biography, Carisbrooke Castle, architecture of the Isle of Wight

At the time of his death in 1899, William Tucker Stratton was regarded as the foremost Island local historian. The Isle of Wight County Press (4th November 1899) stated

> *"…Eminent as a historian, a man of wide reading, and high intellectual attainments, the late Mr Stratton attained great distinction as an archaeologist and antiquarian…He was a valued contributor to our columns…The deceased gentleman was an antiquarian of rare acumen, accomplished in the reading of Norman-French and Latin."*

The County Press bemoaned his death. He was engaged in a great desire to publish a History of the Isle of Wight, *"but unfortunately for the Island, he died before realising his ambition."* Up to his death he was engaged in deciphering ancient records *"…from which he gained a priceless store of information as to the history of the Island, much of which it is feared will now remain a sealed book"*. The County Press concluded *"His death is indeed a loss to the Island…"*

Today, Stratton is completely forgotten, eclipsed by his younger contemporary, Percy Goddard Stone (1856-1934) and incidentally by the Rev. Edward Boucher James (1816-1892) (Matthews, 2022).

Stratton was born on 27thJuly 1825, the eldest son of William Stratton Senior (1794-1867) and his wife Jane, née Tucker (1800-1880). For some reason, he was not baptised until 24th October 1827, with his brother Robert, born that year. A much younger brother was Frederic Stratton (1840-1916), solicitor and botanist (Matthews, 2024). William Stratton Senior was a builder and stonemason in Newport and Carisbrooke, whose lasting building is St John's Church Newport (1836-1837). His firm was substantial and carried on by his son Robert after his death until the 1880s. He was also a Borough Councillor in the 1850s.

Little is known of William Stratton's early life. His brother Frederic was privately educated, so it is likely that William and Robert were as well. The education would have been basic – reading, writing, arithmetic and scripture. He would have been largely self-educated as far as Latin and Norman-French were concerned. He was noted as a wide reader – typical of his period. Early on, he developed a lifelong habit of long walks on the Island, exploring its medieval churches, and as a very young man was already knowledgeable about the Island's history.

His father probably took the view that his eldest son was too studious to follow him in his building business – that was left to his second son, Robert. He must have determined for him that an appropriate calling would be architecture, and he would have been articled as a pupil to a local architect. There is no record of his master, but a likely candidate is Richard Hall Moorey, a business associate of William Stratton Snr and engaged as surveyor in the construction of St John's Church Newport. Stratton called himself "Architect" by 1845 when he was only 20 years of age.

The profession of architect was very fluid at this period. The governing body, eventually called the Royal Institute of British Architects, was only constituted in 1834. Prior to this, architects tended to be from the nobility or gentry, studying and practising architecture as an activity rather than as a living. There was a crossover with surveyors and engineers. Even on Stratton's death in 1899, his firm was described by the County Press as "architects, engineers and surveyors".

Stratton's first years in practice, between 1845 and 1850, seem to have been engaged in surveying and engineering for large railway lines on the mainland – the period of "railway mania". When railways arrived on the Island a generation later, he was engaged in surveying work by the Isle of Wight Central Railway.

Stratton started to practice in the Island about 1850 and the 1852 Post Office Directory shows him practising as Architect and Surveyor at 54, High Street, Newport. He then formed a partnership with Frederick Mew under the style of Stratton and Mew in 1858, operating from Lugley Street, Newport. The partnership seems to have been relatively short-lived, as from 1859 Stratton is shown in practice alone in Lugley Street. (Frederick Mew designed Newport Methodist Church 1879-1880.)

Also practising in Lugley Street in 1855 was Richard Hall Moorey; he had ceased to practice by 1859, and it is highly likely that Stratton took over Moorey's practice. By 1871, Stratton was living at, and practising from, 69, High Street Newport as Architect and Civil Engineer. He had a resident housekeeper, Ann Dore. In 1878, he is shown in partnership with Robert Braxton Perress under the style of Stratton & Perress, still at 69, High Street. By 1886, the partnership had terminated with Stratton practising on his own at 31, Holyrood Street and Perress at 64, Lugley Street.

Until 1873, Stratton had been a life-long bachelor, with a resident housekeeper but no other servants, but in this year, at the age of 48, he married Julia Anne Morton, aged 23, at Chelsea. She may have been a housekeeper but very little is known about her except she was born in Bedford. Stratton's obituary notice in the Isle of Wight County Press refers to her as heading the mourners but only

styles her "the widow" without any name, which might suggest that she had lower social status than her husband. Julia continued to live on the Island until her death in 1938, at the age of 86.

In 1876, Stratton acquired Bury House (today Berry House) in Carisbrooke High Street, a somewhat rambling early 19th-century building. He designed a porch which is entirely in keeping with the building. In a rather squashed area at the top of the porch doors is inscribed in ornate metalwork "W. T. and J. A. Stratton AD MDCCCLXXVI" (1876) in a style approaching Arts and Crafts.

Stratton's last articled pupil was John Curtis Millgate (1867-1956). On completion of his articles, Millgate set up on his own but then entered into partnership with his former master under the style of Stratton & Millgate. In 1894 and 1895, the firm is shown practising at 69, High Street, Newport but by 1897 had moved to 21, Quay Street, Newport. By this time, Stratton although the senior partner had been in poor health for some time, and the prime force in the firm was Millgate. The firm continued under its original name from the same premises long after Stratton's death until 1956 when it was then acquired by N.H. Smith. The offices continued to be used by the successor firm until the early 1980s. Millgate himself was a distinguished antiquary, and we owe to him the preservation of both God's Providence House and the Roman Villa in Newport.

Stratton established a busy and widely varied practice. Railway work engaged him on the Island between 1860 and 1880. Many of his commissions were for the Anglican Church such as Freshwater National School (1850), Binstead National School (1853) and an extension to Calbourne National School (1863). He entered competitions for a Winchester Chapel (1851) a chapel at Worth Matravers (1866) a new church at Sandford, Cheltenham in the 1860s, a possible new church at Whippingham (1855) and St James Street Congregational Church, Newport (1865).

There was also the Workhouse (1868 and 1880), a new road at Whiteley Bank (1871), the Isle of Wight Cricket Ground at Skew Bridge, Shanklin (1890), the Dissenters' Chapel at Northwood Cemetery (1855), West Cowes Gas Works (1857) the foreshore and approach to Cowes Ferry (1860), and the water supply to Cowes Reservoir (1863-1864). A valuable client, the brewing company Mew Langton provided him with much work connected with public houses on the Island and in the New Forest throughout the 1880s.

As a church architect, Stratton first achieved significance with his work at St Mary's Brighstone in 1852. He re-modelled the chancel in an almost-convincing Early English style and altered windows on the south side from Perpendicular to Neo - decorated, in the words of Lloyd & Pevsner

"confusing the already complicated history of an otherwise Norman to 17th Century building" .

(Lloyd & Pevsner, 2006. p52)

In fairness to Stratton, his brief was very restricted, and his designs were dictated by the demands of the then Rector, the Rev. Edward McAll. He restored an arch at All Saints', Calbourne in 1873.

Stratton's work at All Saints', Freshwater (1875-1876) also met criticism. Here the present chancel is largely Stratton's work, giving a misleading impression that the aisles were restored medieval. Pevsner states

"the Church looks largely 19th Century outside due to a restoration by W. T. Stratton".

(Lloyd & Pevsner, 2006. pps 138-140)

Conversely a new work by Stratton – St Swithin's new church in Thorley (1871) met with approval from Lloyd & Pevsner (p. 281) *"A work of originality from an Island architect"*. Notable features of this building included an unusual bell-turret and internally, a lively linear decoration. The sanctuary especially had wall tiles in strident colours of red, brown and blue.



Fig. 1: St Swithin's church showing the bell tower.

In 1845, there appeared the first volume of a book with the grandiloquent title

'Architectural and Picturesque Illustrations of the Ancient Parish Churches of the Isle of Wight with concise historical descriptive and critical remarks by William Tucker Stratton, Architect, and William Jacobs'.

The book was printed by W. W. Yelf, Holyrood Street, Newport, Isle of Wight. The copy in the County Records Office is inscribed "Fred Stratton", Stratton's younger brother, and there is a pencil note, probably in Frederic's hand, *"the illustrations were drawn on lithographic stones by W.T.S."* William Jacobs was a cousin of Stratton on his mother's side. There is no indication of what part he played in the production of the book.

There is an introduction to the Island and its divisions into East and West Medine. The information from the History of the Wight by Sir Richard Worsley (1781) is acknowledged. There is then a *"General History of Ancient Ecclesiastical Establishments of the Island"*. The book was concerned only with medieval structures.

"Within the last few years a considerable addition has been made to the list of sacred edifices in the Island by the erection of chapels of ease to various

localities to meet the wants of the greatly increased population; these although many of them exceed in architectural beauty the venerable remains of an earlier age, it forms no part of our plan to illustrate. We confine ourselves strictly to the ancient parochial churches which must be… objects of interest to all, not only for their intrinsic beauty and merit…but also on account of the associations attached to them - as connected to our ancestors." (Stratton & Jupe, 1845. p.4)

Stratton had strong romantic feelings for the Island's medieval Churches.

"As places unchanged while a complete revolution has occurred in our national religion, habits and feelings – as places within whose walls have at different periods assembled the steel-clad warriors of a fierce and barbarous age, and the peaceful worshippers of a later more-favoured time to adore the beneficent Creator of the universe. An ancient building of any sort is generally an object of picturesque beauty but an old church more particularly so…the imagination carries us far back to the dim and distant days of antiquity peopling the scene with the forms of those who have long been numbered with the dead and whose ashes are covered by the green sward at our feet" .

He continues on the effects of a vision of a medieval church:

"Viewed in the sunny brightness of a summer morning what a holy quietude seems to shed in the surrounding scenery … seen amid storm or tempest or in the sole solitude of night it ever stands forth…and seems to bid defiance to the efforts of time and the elements…"

Stratton (Stratton & Jupe, 1845) stated that there was no place where the demolition of ecclesiastical relics was more zealously carried out than in the Isle of Wight. Those that have escaped

"have been generally shrouded in thick coats of plaster overlaid with that composition long used for beautifying churches known as whitewash"

Stratton loathed whitewash!

Stratton lists over 30 medieval Churches, including Old St Thomas in Newport and St Nicholas-in-Castro, a Parish Church in its own right. He then begins with a detailed account of each Church with a plan, and drawings of exterior, interior (not unlike Brannon) and other features.

In the first volume, Arreton, Calbourne and Shalfleet are featured with a footnote on Newtown (not a Parish Church but a chapel of ease to Calbourne). Noting at St George's Arreton, the columns and caps supporting the aisle wall are of Purbeck marble and singularly graceful in their proportions, he thunders:

"… but by the ignorance of former officials and the apathy of the present they are condemned to remain in the bondage vile of a thick coat of whitewash which the judicious expenditure of a trifling sum would restore to their pristine beauty." (Stratton & Jupe, 1845. p.5)

At All Saints Calbourne, he records that

"the whole edifice has been recently restored in a manner reflecting the highest credit on the good taste and liberality of Sir Richard Godin Simeon (the local Squire). The font relieved from whitewash proved to be a very curious example of Norman workmanship formed of Purbeck marble".

The note on Newtown states that the Church had been in ruins but recently rebuilt in the Early English style (Stratton & Jupe, 1845. p10).

His usual complaint at the Church (not then dedicated, but in modern times St Michael's) at Shalfleet had *"Pillars unfortunately covered with thick paint."* He noted the chancel was ruinous but partly re-built. Shalfleet's distinctive tower had its North wall taken down and rebuilt, which had disfigured the Church (Stratton & Jupe, 1845. p. 11).

Volume 2 of the book looks at the Churches at Godshill, Freshwater and Yarmouth. There were no particular notes on All Saints, Godshill. At All Saints, Freshwater, a church he would later be professionally concerned with, he noted that it had been much disfigured with galleries which had now been removed (Stratton & Jupe, 1845, p19).

St James, Yarmouth, arguably should not have appeared in the book as it was built in the early 17th century and is therefore not a medieval Church. Stratton probably included it as it had medieval predecessors on the same site. It is the one Church where he does not provide an exterior drawing. In the chancel of the Church was a polygonal ceiling of oak with Tudor roses at the intersections of the compartments.

"a very tolerable specimen of the style of that period but the whole has unfortunately been painted a stone colour". Large galleries had been constructed but *"have not increased the architectural effect"* (Stratton & Jupe,1845. p.19).

It seems likely that Stratton envisaged several more volumes dealing with the other medieval churches he had listed. It can only be a matter of conjecture as to why the project was abandoned at a relatively early stage. From the listing of the churches at the beginning of Volume 1 and the general introduction, it seems plain that he intended a full survey of them all. It may be that his leaving the Island between 1845 and 1850 to carry out surveying work for railways on the mainland completely disrupted his original intention. On his return to the Island, he does not seem to have taken up the project again. It is a matter of great regret that his work, which would have given us a complete picture of the medieval churches before most of them experienced extensive restoration, was never completed. It would have been fascinating to have seen his views on Old St Thomas, Newport.

A rather more successful work was "*A Guide to Carisbrooke Castle Isle of Wight by William Tucker Stratton, Architect*", which proved popular and went into five editions, the last one being in 1887. Published by the late Major John McGrotty and printed by G.A. Brannon, County Press Offices, Newport, it had 24 pages and was priced 6d. John Baldwin McGrotty (1826-1887) was Custodian of the Castle 1878-1887.

Stratton held the view that the Castle walls and keep were constructed by the Saxons in the 6th Century on an earthen bank formed by "Ancient Britons". His theory was that the word "Carisbrooke" was an

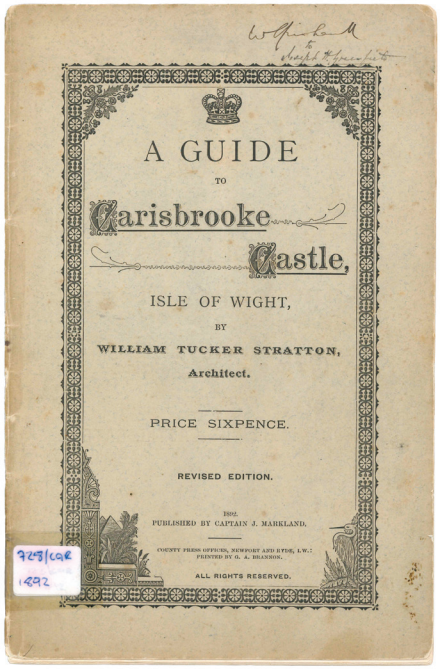

Fig.2: Front cover of Stratton's Guide to Carisbrooke Castle

incorporation of "*Caer* in the Ancient British tongue" meaning a wall fort or city and "*Burr* or *Burgh*" being an embankment of earth. He stated there was no Roman presence in the Castle.

He is on much safer ground with the known historical features of the Castle (Stratton, 1887. pps. 4-6). He gives trenchant criticism of unfortunate restoration work carried out in 1856. St Nicholas-in Castro, still a Parish Church, had its roof *"wilfully dismantled in 1856", "the sacred edifice has been unroofed and made into an artificial ruin"* (The Chapel had been rebuilt in 1738). (Stratton, 1887. p. 8).

Referring to work carried out to the 14th Century Great Hall:

"The original features of this interesting portion of the building had been almost entirely concealed in paint destroyed by successive alterations, but it remained for the present generation to witness their complete effacement at public cost under the guise of (so-called) 'restoration'. At that time (1856) the present windows all were alike to a pattern for whom, there was no good authority and regardless of the different dates of the building – were inserted, the fine arched stone fireplace in the day chamber after being exposed for a time was again built up and plastered over and one large window in the west gable constructed in place of the two with a central pier of the original edifice. This reckless treatment of a national historical building is the more to be regretted because the considerable sums then expended in doing irreparable damage, would if properly applied have gone far to rescue the most important archaeological features of the castle from the state of decay brought about by many years of careless and ignorant neglect and have preserved them for the instruction and pleasure of all who feel an interest in such relics of the past."
(Stratton, 1887. pps.16-17)

Referring to original barracks being converted to Militia quarters he states:

"until a very few years (it) contained two handsome arched and panelled fireplaces with projecting chimneys, but these were ruthlessly destroyed. It is much to be regretted by all who have the slightest reverence for antiquity that a national historical place like Carisbrooke Castle should be degraded to such uses and still more that the works rendered necessary thereby should have been carried out with such utter disregard of the ancient features that the latter were entirely obliterated." (Stratton, 1887. p.18)

Stratton's Guide is the first popular Guide to the Castle. An amusing quote to us today is the short explanation of the donkeys working the wheel.

"…the water is raised by means of a donkey walking within a large tread-wheel in the same means as roasting spits were formerly worked by dogs." (Stratton, 1887, pps. 6-7)

In the Introduction to the 5th Edition of the Guide, Stratton refers to *"Notes made for a more extended History of the Castle now in course of preparation by the author"*. Sadly again, the promised History never materialised.

Stratton's last foray into writing occurred in 1884/1885 when George Brannon asked for contributions for his new newspaper, the Isle of Wight County Press. In the first issue of 29th November 1884, under a column headed Historical and Archaeological (p.3), appeared *"Notes for a History of the Isle of Wight by Wm Tucker Stratton"*. Stratton wanted to promote both an Isle of Wight Historical and Archaeological Society and a new book on Island History – the first since that of Worsley in 1781.

The first article was headed "*The Borough of Newport*". Explaining that Newport began as a piece of land forming part of the Manor of Shide in 1086 to become a Borough in 1184, Stratton set out the original Charter in Latin with an English translation to follow. He showed that the three witnesses were principal landowners in the area – William, son of Stur and William and Gozelin, sons of Azor. The descendants of Azor formed the family of De Insula and then the family of White Popham in direct descent. He described the descent of the other witnesses and their eventual landholdings.

The second article appeared in the issue of the following week, 6th December 1884. (p.3) Stratton stated that the infant Borough had no Church at least until 1172 and it was dedicated to the recently murdered and canonised Thomas A Becket. Remembering his knowledge of medieval Churches, he said

"The original pillars and arches of the Nave with small pointed cieppe-storey windows above the centre points of the arches remained until the year 1856."

The extent of the Borough carried out in 1262 by Baldwin de Redvers was lost from public records. He referred to an undated Charter of Liberties by Isabella de Fortibus with references to Castlehold forming part of the Parish of St Nicholas and only brought into Borough jurisdiction

" when its freedom from their control made it a little Alsatia and an intolerable nuisance to law-abiding people".

Interestingly the Charter of Isabella existed in the

19th century but it had disappeared after production in a trial at Winchester Assizes. Fortunately, a copy existed in Worsley's History. He noted the witnesses to Isabella's Charter (between 1262 and 1290) were descended from the witnesses to the Charter of Richard de Redvers in 1184.

In the issue for 13th December, (p.3) there is no article by Stratton, but there is for the first time in the column an unsolicited letter from the Rev. Edward Boucher James, Vicar of Carisbrooke.

A correspondent expressed

"the thanks of all who are interested in our local archaeology and history are due to Mr Stratton for the extremely valuable information he is giving us in your columns."

From that time on there is a regular letter from James in the column.

Stratton returned to the column on 20th December with his article "*The King's Town of Brading"* and gives entries in Domesday Book both in Latin and English. By chance, James sent in a letter on the Oglander family. The editor stated

"Our readers will, we are sure, join us in the wish that the Vicar of Carisbrooke will continue his extremely interesting contributions".

Stratton sent in a further article on Brading for the issue of the 3rd January 1885. This time he produced medieval records again in Latin and English. In the issue of 19th January 1885, W.H. Long, a local historian in his own right and the author of Isle of Wight Dialect, stated in a letter to the Editor

"As a native of the Isle of Wight and one much interested in its history and antiquities, I read with great interest every week the notes of Mr Stratton and the Rev. E.B. James."

But there were to be no further contributions from Stratton, and James took over the column completely. One would imagine that the Editor felt some relief. James' letters varied in topics each week. He could write on the entire spectrum of Island history – from Celtic and Roman times to the Island in 1850. His style, although not easy for a modern reader, was much more readable and interesting than Stratton's. Stratton was a scholar who delighted in abstruse matters. He was primarily a medieval scholar. His articles in the Isle of Wight County Press are for scholars rather than interested readers.

Stratton, although highly significant in the Island during his lifetime, is forgotten today because of a fatal inability to complete the grand and worthy projects he started. Thus, his early work on medieval Churches simply stopped after an examination of only six of them. He failed to produce his promised extensive work on Carisbrooke Castle. His attempts to produce a comprehensive history of the Island failed after a few instalments. He failed to set up the Isle of Wight Historical and Archaeological Society. Finally, his efforts at translating medieval records also came to nothing.

The reason for all this is undoubtedly the fact that he had a very busy and varied architectural practice. In his last years, ill health must have also played a part. But it was compounded also by a tendency, often found in self-educated scholars, to get bogged down in minutiae and detail, and failure to maintain general principles firmly in mind. ("Not seeing the wood for the trees" is a common expression.) This is demonstrated clearly in the County Press articles.

By the late 1880s, no doubt overcome by over-work and declining health, Stratton must have realised that he would never complete a comprehensive History of the Isle of Wight. He bears an uncanny resemblance in this respect to his younger brother Frederic who produced a little book on Isle of Wight botany in 1900 and promised a comprehensive book on Isle of Wight plants. He did so, but only as a section of the magisterial *A Guide to the Natural History of the Isle of Wight* edited by Frank Morey in 1909. Unfortunately, W. T. Stratton had no editorial figure in the same way. The appearance of the monumental work entitled *The Architectural Antiquities of the Isle of Wight from the XIth to the XVIIth Centuries inclusive* by Percy Goddard Stone in 1891 would have brought to an end any remaining thoughts of a history as far as Stratton was concerned. He was generous enough to give Stone his notes and there is a graceful acknowledgment to that effect by the younger man.

"… I cannot in justice conclude….my indebtedness to Mr. W.T. Stratton of Carisbrooke for his kindly assistance in the way of notes and local knowledge which has largely contributed to make my work what it professes to be - a reliable publication". (Stone, 1891. p.4)

Stratton was a modest man, well-liked by those who knew him. He does not deserve the oblivion into which he has fallen. He was probably the first person to recognise the importance of the Island's medieval period and its buildings. He was also remarkably prescient about the damage that was being caused by so many Victorian restorers to medieval Churches – who in their desire to improve, were destroying what they were endeavouring to preserve.

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Author: John Matthews
Email: john34matthews@gmail.com

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FLOWERING PLANTS AND FERNS, ISLE OF WIGHT 2024

Colin R. Pope

2024 has proved to be a productive year for botanical recording, following a run of relatively poor years. Undoubtedly, a contributing factor has been the high levels of rainfall for much of the growing season. A BSBI weekend was held in early June, to show visiting members some of our rich flora.
The list below covers the new and other interesting records. The records have been divided into those of native species and archaeophytes (plants associated with man's activities that are known or suspected to have occurred in this country since at least medieval times) and those of non-native species (neophytes). Nomenclature follows Stace (2022); some of the Latin name changes may be unfamiliar to botanists. I am grateful to everyone who submits their records; all of them are valuable and all records have been stored, whether reported here or not, and have been submitted to the BSBI.

Natives and Archaeophytes

Hybrid Horsetail *Equisetum* x *rothmaleri*
The hybrid between Field Horsetail and Marsh Horsetail was recorded from Warden Point landslip (SZ324878) PS, conf. Alan Leslie. It was previously recorded from nearby Brambles Chine in 2007, but the site was lost by 2017 due to cliff movement.

Mousetail *Myosurus minimus*
A remarkable record of thousands of plants on waste ground used as a carpark at Shide (SZ503881) AM (Fig.1). Classified as vulnerable in England.



Fig. 1: Mousetail, *Myosurus minimus,* growing in quantity on unused carpark at Shide. Photo: Keith Marston

Rue-leaved Saxifrage *Saxifraga tridactylites*
One plant on wall in Dover Road, East Cowes (SZ501957). This plant appears to be showing a modest increase in sites in recent years, in common with the trend in other places in England.

Slender Tare *Ervum gracile*
(formerly *Vicia parviflora)*
At least 15 plants on slumped cliffs at Forelands (SZ647869), a traditional site known since 1952 but not recorded from here recently. Six plants at Lynn Bottom Tip (SZ535885) PS & ML. Classified as vulnerable in England.

Heath Milkwort *Polygala serpyllifolia*
Recorded in small quantity from a site on St Catherine's Down (SZ495784) PS. This is the first record from this heathland site, although it would be expected from here. The Southampton botanist John Rayner recorded Common Milkwort (*P. vulgaris*) from here in 1928, and possibly earlier. No other records of either species from St Catherine's Hill.

Dropwort *Filipendula vulgaris*
A large, poorly flowering clonal patch to the northwest of the Tennyson Monument on Tennyson Down (SZ324853) mo, seen during the BSBI weekend. A rare chalk grassland plant on the Island.

Round-leaved Dog Rose *Rosa tomentella*
One bush at Cranmore (SZ395900) PS & ML. A rare plant with us, often associated with historic heathland sites. Last recorded from the Cranmore area in 1999.

Sweet Briar *Rosa rubiginosa*
One plant in verge of Military Road at Compton Chine (SZ370851) PS.

Spear-leaved Willowherb *Epilobium lanceolatum*
Numerous plants at Halberry Lane, Newport (SZ507899), one plant at Totland (SZ329878) and two at East Cowes (SZ503958) PS. One of our rarer willowherbs.

Sea Knotgrass *Polygonum maritimum*
A single small plant was found amongst *Zostera* debris on the small beach at Bouldnor (SZ374901) PS, AL & PH (Fig. 2). It was in its first year and appears to have been washed away by a high spring tide subsequently. Sea Knotgrass appeared for the first time on the Island on the shore at Thorness Bay where it increased over a number of years before finally disappearing after 2002. It has not been seen on the Island since, but there are a few flourishing colonies on the Hampshire coastline which have no doubt provided a seed source. Classified as vulnerable in England.



Fig. 2: Sea Knotgrass, *Polygonum maritimum,* a single small plant on the strandline at Bouldnor.
Photo: Paul Stanley

Triple Hybrid Dock *Rumex obtusifolius* x *crispus* x *sanguineus*
The triple hybrid between Broad-leaved Dock, Curled Dock and Wood Dock was recorded from a weedy field east of St Rhadegund's path, St Lawrence (SZ531765) by visiting botanist Geoff Kitchener. First Island record.

Hybrid Sea-spurrey *Spergularia marina* x *rupicola*
The hybrid between Lesser and Rock Sea-spurrey was recorded from Warden Point, Colwell (SZ324877) PS. There were numerous plants on a seawall, with both parents. There is one previous Island record, in 2017, from Bonchurch.

Long-stalked Orache *Atriplex longipes*
Rear of saltmarsh below Firestone Copse (SZ550909) PS, conf. Alan Leslie. The third Island record.

Hybrid Orache *Atriplex glabriuscula* x *prostrata*
A single plant of the hybrid between Babington's and Spear-leaved Orache was recorded from Bouldnor beach (SZ374901) PS, AL & PH. There is one previous record, in 1999 from Whale Chine.

Early Gentian *Gentianella amarella* ssp. *anglica*
This year intensive counts were carried out on National Trust sites by Paul Davies (National Trust warden seconded to a Natural England species recovery programme) and his team of volunteers. The overall impression was that 2024 was a fairly average year for the species. However, there was a surprise count of around 22,365 plants on Chillerton Down (SZ480836) on 23rd May, far higher than previous counts on this site and the highest count of all monitored sites this year. A previous count on this site by Sue Telfer in 1994, considered to be an exceptionally good year for the species, was less than five thousand plants. It may be that improved management by the National Trust has contributed to this increase.

Weasel's-snout *Misopates orontium*
Five robust flowering plants found at the Garlic Farm, Newchurch (SZ555865) CP & DT (Fig. 3). They were growing on the side of a ditch in sandy arable ground and brought to the surface in the construction of a sustainable grey water treatment system, which has released a long-buried seed source. Historically, it is likely that this would have been a frequent arable 'weed' in the Newchurch area. In 1922, the Society found plants at the side of the arable field which is now the Wildlife Trust's Martin's wood reserve.



Fig. 3: Robust plant of Weasel's-snout (*Misopates orontium*) in field at Newchurch Garlic farm. Photo: Dave Trevan

Two plants were found on disturbed ground in the nursery area at Ventnor Botanic Garden (SZ549770) CP & NA. It is not grown at the Garden, but there is a historic record of it in arable fields at the top of the cliff from 1823.
Weasel's-snout is now a rare and declining plant on the Island. It is classified as vulnerable in England.

Wild Clary *Salvia verbenaca*
Several plants on waste ground near The Monument, Bembridge Point (SZ642888) CP & NA. There has been a scatter of records of this local plant from around Bembridge Harbour, but this is the first since 2011.

Hybrid Cat's-ear *Hypochaeris* x *intermedia*
After intensive searching during a BSBI weekend, just two plants of this hybrid were found amongst large quantities of both parents on St Helen's Duver (SZ637890) MS, mo (Fig. 4). First record from this site.



Fig. 4: Flowers of Cat's-ear (*Hypochaeris radicata*) (left), Smooth Cat's-ear (*H. glabra)* (right) and the hybrid *H.* x *intermedia* (centre) at St Helen's Duver. Photo: Sam Thomas

Dandelions *Taraxacum spp.*
Paul Stanley has continued his investigation of Dandelion micro-species, a poorly recorded group of the Island's flora. This year he has recorded the following 25 taxa, all confirmed by national expert A. John Richards. They range from frequent and widespread species to some which are local and rare. *Taraxacum amplum** Newport SZ4990; *T. boekmanii** Mottistone SZ4083; *T. brachyglossum** SZ6389, SZ4975, SZ5485 & SZ4990; *T. dilaceratum** SZ4993; *T. discretum** SZ4084; *T. duplidentifrons** SZ4084; *T. exacutum** SZ4990; *T. fulviforme* SZ4084 & SZ3387; *T. glauciniforme* SZ4183; *T. hamatum** SZ4084; *T. hamiferum* SZ4290; *T. incisum** SZ4582; *T. lacistophyllum* SZ4383; *T. lamprophyllum** SZ4990; *T. latisectum** SZ3286; *T. leucopodum** SZ3286; *T. oxoniensis* SZ4383, SZ4184 & SZ4083; *T. palustre* SZ6389; *T. proximum* SZ4989; *T. pseudoproximum* SZ6291; *T. pulchrifolium** SZ4990; *T. rubicundum* SZ4990; *T. subundulatum** SZ4990; *T. subxanthostigma** SZ5088; *T. tumentilobum** SZ4990; and *T. undulatum** SZ4990. Those with an asterisk are first Island records.

Cornflower *Centaurea cyanus*
One large plant at the margin of a barley field at Ramsdown, Chillerton (SZ478829) CP (Fig. 5). In the

early 2000s, Cornflower was frequent in fields in the general area but a change in arable cultivation has meant that is has been rarely seen recently.
Several plants were found at the Garlic Farm, Newchurch (SZ555865) CP & DT, growing in sandy arable ground, arising from seed brought to the surface in the construction of a sustainable grey water treatment system. There are historic records of Cornflower as an arable 'weed' in the Newchurch area.



Fig. 5: Cornflower (*Centaurea cyanus*) in a barley crop at Chillerton. Photo: Colin Pope

Hairy-fruited Cornsalad *Valerianella eriocarpa*
This rare plant seems to have declined in its sites on thin soil on the lower chalk, so it was a surprise to find hundreds of plants scattered over a sandy field at Hill Heath, Alverstone (SZ572856) NA (Fig. 6). Twentieth century botanists knew these fields for their specialised acid sandy soil annuals. They were regularly surveyed but Hairy-fruited Cornsalad was never recorded from here.



Fig. 6: Hairy-fruited Cornsalad (*Valerianella eriocarpa*) in a sandy field at Alverstone. Photo: Nick Aston

Sea Holly *Eryngium maritimum*
On the shore northwest of White Ledge, Forelands (SZ654872) GT. Although well-known from St Helens Duver, this is the furthest east this species has been recorded.
Broad-leaved Helleborine *Epipactis helleborine*
A total of ten flowering plants at Branstone Farm Park, Apse Heath (SZ556838) AM & DT. First record from this site but Broad-leaved Helleborine is being increasingly recorded from new sites.
Bird's-nest Orchid *Neottia nidus-avis*
Two spikes in Bunkers Copse, Rookley (SZ503846) RA. Never common on the Island, this is the first record from this site since 1995, and the first Island record since 2021 after which it has failed to reappear at its well-known Ventnor site. It has decreased nationally and is now classified as vulnerable.
Frog Orchid *Coeloglossum viride*
Four good specimens in the usual site on Afton Down (SZ367851) RP and thirty nearby on the north side of the down (SZ365858) SOM. This is the highest count at this traditional site since 2012. Classified as vulnerable in England.
Lizard Orchid *Himantoglossum hircinum*
A robust vegetative plant was found on a road verge in December at Dodnor (SZ502916) (PS. Fig.7). This is the first Island record for ninety years. Specimens were found near Havenstreet in 1933 and 1934, at a time when it was appearing widely in England. The species is currently exhibiting a resurgence with plants appearing widely across southern and eastern England.



Fig. 7: The first Island Lizard Orchid, *Himantoglossum hircinum* for 90 years. Photo: Jillie Pope

Early Spider Orchid *Ophrys sphegodes*
Recorded this year from above Freshwater Bay where there was a single plant and a tight cluster of four plants (SZ341855) RP. Unfortunately, they became badly damaged by salt winds. None were found elsewhere on the downs towards the Needles headland this year, but a surprise find was a single plant on Mottistone Down (SZ418844) RL, raising the possibility that there may be other scattered plants on the West Wight downs.
Dwarf Sedge *Carex humilis*
A single small patch of this rare early-flowering downland sedge was found on West High Down (SZ311850) PS. A second substantial clump was located on Mottistone Down, 60m west of the first patch found in 2013 (SZ415845) CP.
Borrer's Saltmarsh-grass *Puccinellia fasiculata*
Recorded from Bonchurch seafront (SZ577778), a new site PS. Classified as Near Threatened in England.
Small Cord-grass *Spartina maritima*
The saltmarsh island populations on the MOD land at Clamerkin, Newtown estuary were revisited in 2024 for the first time since 1999 (SZ429915) CP & NA (Fig. 8). The plant remains frequent here. It occurs in quantity over some 7ha of saltmarsh making this by far the largest population of this native saltmarsh grass in southern England. Its survival here is by virtue of the fact that these saltmarsh islands are

inaccessible to grazing livestock. Classified as endangered in England.



Fig. 8: Small cord-grass (*Spartina maritima*) on Clamerkin marshes, Newtown estuary. Photo: Colin Pope

Aliens (Neophytes)

Australian Tree-fern *Dicksonia antarctica*
Four or five large plants on the north facing bank of Madeira Road, Totland, leading down to the beach (SZ323870) CP & NA. They looked to be well established amongst rank natural vegetation, but it transpired that they were originally planted by the Council as small plants acquired by Ventnor Botanic Garden.

Stinking Hellebore *Helleborus foetidus*
Two plants on inaccessible silty bank that floods regularly, Fattingpark Copse (SZ5291) LD. They must have arisen from propagules brought down in the Palmers Brook, but they were remote from any gardens.

Strawberry Saxifrage *Saxifraga stolonifera*
Large, well-established patch of the form *tricolor* at the edge of a woodland clump in the middle of Osborne Golf Course (SZ519953) JW (Fig. 9). First Island record. This plant is rarely reported as an established alien with most of the few records coming from western Britain. It is possible that the plants at Osborne were originally planted by a previous head groundsman who was a keen gardener.



Fig. 9: Strawberry Saxifrage (*Saxifraga stolonifera*) well established on the golf course at Osborne.
Photo: John Wilmott.

Crimson Clover
Trifolium incarnatum ssp. *incarnatum*
Several plants on Ventnor western cliffs, (SZ556771) RS (Fig. 10).

Woolly Clover *Trifolium tomentosum*
Numerous plants in Cook Avenue, Newport (SZ509898) PS. Otherwise only known from a carpark at Nodes Point campsite.

Hybrid Cockspurthorn *Crataegus* x *lavalleei*
Two old multi-stemmed small trees on scrubby verge at Upper Adgestone Road (SZ596865) CP with large, orange fruits. Originally determined as *C. persimilis*. Only Island record.

Hybrid Alder *Alnus glutinosa* x *cordata*
A single self-sown tree at Swainston (SZ439879) PS & ML, confirmed Alan Leslie. First Island record.

Black Poplar *Populus nigra* ssp. *betulifolia*
The true native Black Poplar has only ever been known from a handful of scattered trees on the Island and its truly native status has always been questionable. In 2024, Mark Simmons from the Isle of Wight National Landscapes office sent material from three of the trees to Forest Research, Roslin, for DNA fingerprinting. The samples were from the tree at Flowers Brook, Steephill; the tree by the east bank of the river Yar at Roud and the gnarled pollard at Chilton Farm. All were confirmed as ssp. *betulifolia*. Stuart A'Hara replied that all three were male trees of the clone CL 28, known as the Manchester Poplar which is a very common and widely planted cultivar across the UK.

Asian Bittercress *Cardamine occulta*
In flowerbed at Ryde Esplanade (SZ594979) PS. First Island record. An eastern Asian species which has become invasive in many countries. It is very similar to the native Wavy Bittercress, *Cardamine flexuosa*.

Red Orache *Atriplex hortensis* var. *rubra*
Several plants on waste ground at Bembridge Point (SZ643887) CP & NA. Second Island record.

Japanese Knotweed variety
Reynoutria japonica var. compacta
On waste ground by the shore at Bembridge Point (SZ643887) CP & NA.

Four-leaved Allseed *Polycarpon tetraphyllum*
Recorded this year from a drive in Totland (SZ320862), gravel in a garden centre in Freshwater (SZ342870) and Ventnor Botanic Garden (SZ546770), all PS.



Fig. 10: Crimson Clover *Trifolium incarnatum* ssp. *incarnatum* on Ventnor west cliffs. Photo: Roger Silsbury

Greek Sea-spurrey *Spergularia bocconei*
On track down to Thorness Bay with *S. marina* (SZ453931) PS (Fig. 11).



Fig. 11: Greek Sea-spurrey (*Spergularia bocconei*) on track at Thorness Bay. Photo: Paul Stanley

Spring Sowbread *Cyclamen repandum*
Many plants on a road verge at Quarr (SZ453931) CP.
Ivy-leaved Toadflax *Cymbalaria muralis*
White flowered plant at Easthill Road, Ryde (SZ601921) CP (Fig. 12). First Island record for this white flowered form which is likely to be under recorded.



Fig. 12: White flowered form of Ivy-leaved Toadflax (*Cymbalaria muralis*) at Appley, Ryde. Photo: Colin Pope

Hybrid Monkeyflower
Erythranthe (*Mimulus*) x *robertsii*
In a ditch at SZ503832, near Rookley PS.
Broussa Mullein *Verbascum bomyciferum*
One plant on waste ground at Staplers Hill (SZ508894) PS & ML. First Island record.
Jo-jo *Soliva pterosperma*
Recorded from Totland (SZ321869) PS.
Golden Tickseed *Coreopsis tinctoria*
Several plants on waste ground Bembridge Point (SZ643887) CP & NA. First Island record.
Valdivia Duckweed *Lemna valdiviana*
Ponds by Stag Lane, Dodnor (SZ498918) PS
Yard Grass *Eleusine indica*
Six plants in gravel of Garden Centre, Afton, Freshwater (SZ342870) PS. First Island record.

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Recorders
AL Alan Leslie
AM Anne Marston
BG Botany Group
DT Dave Trevan
GK Geoff Kitchener
GT Geoff Toone
LD Luke Davis
ML Mark Larter
mo Many observers
MS Mark Spencer
NA Nick Aston
PD Paul Davies
PH Paul Harmes
PS Paul Stanley
RA Robin Attrill
RL Robin Lang
RP Roger Powley
RS Roger Silsbury
SOM Stephen Oakes-Monger

Author: C.R. Pope
email: colinrpope@gmail.com

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NEW AND INTERESTING FUNGI, ISLE OF WIGHT,2024

Colin Pope

2024 was generally considered to be a poor year for fungi, despite the prevalence of damp weather. This appears to be contrary to what would be expected, but the pattern has been consistent across the country and shows how unpredictable fungi can be. Even normally common and widespread fungi were sometimes thin on the ground. The only exception was for grassland fungi which did well in the second half of the autumn. In addition, Iain Outlaw has been highly productive, investigating micro-fungi which have been little studied and poorly recorded in the past. He was able to record eleven species seen for the first time on the Island.

* denotes first IW record

AGARICS (Agariomycetes)

Marasmius hudsonii

This small, yet spectacular Parachute fungus has projecting, long stiff red-brown hairs on the white cap and reddish-brown stem. It is easily identified because it only grows on fallen, dead Holly leaves in damp woodland. It is not common, but we record it from time to time in ancient woodlands. However, on our autumn foray in Borthwood Copse we saw a remarkable mass fruiting of this species (mo det. CRP). (Fig. 1)



Fig. 1: *Maramius hudsonii* on holly leaf, Borthwood Copse. Photo: Mike Cotterill

**Hortiboletus bulbalinus*

This bolete has only been recognised relatively recently, and it appears to be quite widespread in southern England. It has very distinctive colours, especially when cut. A single specimen was found during a foray in Ryde Cemetery on 7th November (mo, det. CRP) (Fig. 2). Material was sent to Aberystwyth for DNA sequencing courtesy of Eric Janke of the Hampshire Fungus Recording Group but unfortunately the sample was contaminated and yielded no useful information.

Suillus luridus Lurid Bolete

Found on Afton Down on 1st June growing with Rock-rose (*Helianthemum*) (CRP). One of a group of fungi associated with deciduous trees but also found growing with Rock-rose on downland. (Fig. 3)

Clavulinopis umbrinella

One of our less frequently recorded club fungi found growing in Northwood Park, Cowes on 8th December (mo, det. CRP). (Fig. 4). It was recorded in the picnic area, a site of good old grassland with earthtongues, waxcaps and club fungi. Eight waxcaps including Pink Waxcap were recorded.



Fig. 2: *Hortiboletus bulbalinus*, Ryde Cemetery. Photo: Colin Pope



Fig. 3: *Suillus luridus* on Afton Down. Photo: Colin Pope



Fig. 4: *Clavulinopsis umbrinella*, Northwood Park Photo: Colin Pope

MICROFUNGI.

**Puccinia chaerophylli*

A rust fungus found growing on Cow Parsley (*Anthriscussylvestris*) in Appley Park on 13th January (IO).

**Physalacria stilboidea*

This microfungus is only found on dead leaves of New Zealand Broadleaf (*Griselinia littoralis*). When Iain Outlaw became aware of this, he looked at dead leaves of a *Griselinia* in his garden and immediately found it in quantity. He subsequently found it in many other locations: Highfield Rd., Shanklin; Keats Green, Shanklin; and on Culver Way, Yaverland (IO). On each occasion he found it very quickly, suggesting that it can be found wherever there is a *Griselinia* hedge. (Fig. 5)



Fig. 5: *Physalacria stilboidea* on dead *Griselinia* leaf. Photo: Iain Outlaw

**Beauveria bassiana*

An entomopathogenic fungus found on two dead Darkling Beetles (*Nalassus laevioctostriatus*) beneath loose bark at Los Altos park, Lake on 23rd April (IO). This fungus acts as a parasite of various arthropods eventually killing them. It is the asexual form of one of *Cordyceps* fungi.

**Diaporthe aucubae*

A black Pyrenocarp on dead twigs of Japanese Laurel (*Aucuba japonica*) in garden by Hungerberry Copse, Shanklin (IO).

**Calonectria lauri*

On dead leaves of Holly (*Ilex aquifolium*) in Beech Copse, Godshill on 16th November (IO). It was found in a leaf litter sample collected to examine for invertebrates. Subsequently recorded from a dead Holly leaf in a garden at the edge of Hungerberry Copse, Shanklin. (both IO). The tiny yellow perithecia are specific to Holly leaves. (Fig. 6)



Fig. 6: *Calonectria lauri* on holly leaf. Photo: Iain Outlaw

**Cylindrium elongatum*

Found on dead leaves of Holm Oak (*Quercus ilex*) in a Ferncliff Gardens, Sandown on 19th November (IO). It forms white, effuse colonies bearing long chains of long narrow conidia. (Figs. 7 & 8)

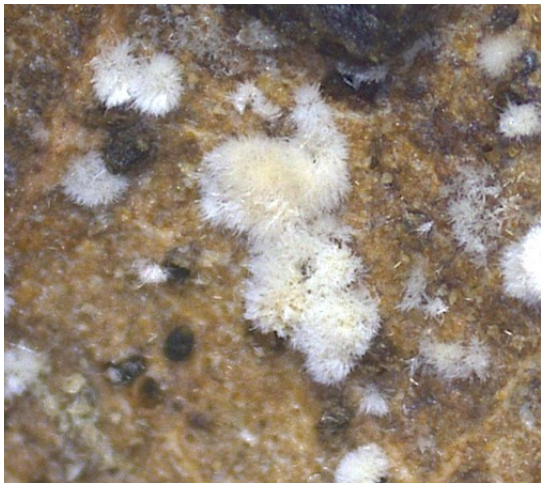

Fig. 7: *Cylindrium elongatum* on holm oak leaf. Scale bar is 0.5mm Photo: Iain Outlaw



Fig. 8: *Cylindrium elongatum* conidia. Photo: Iain Outlaw

The *Laboulbeniales* are tiny Ascomycetes, 0.03-2mm high, that grow on living insects, millipedes and other arthropods. Each species has one or several hosts and some are always situated on specific areas of the hosts. They do not have a true mycelium and apparently do not enter the host cavity but get their nutrients only from the exoskeleton. Early in the year, Iain Outlaw collected a number of beetles from Haddon's Pits, Luccombe. Almost every surface of the beetle *Catops morio* was covered in the fungus, **Asaphomyces tubanticus* and a rove beetle (*Sepedophilus constans*) was carrying **Stichomyces conosomatis*.

Recorders

CRP Colin Pope; IO Iain Outlaw; mo many observers
Abbreviation: det. Determined by

Author: C.R. Pope **email:** colinrpope@gmail.com

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HIGHLIGHTS OF DINOSAUR ISLE MUSEUM 2023 - 2024:- RECENT PUBLICATIONS

Alex Peaker

Since 2023, four new taxa have been described from the collection of Dinosaur Isle Museum: three new genera of dinosaur, and a new insect genus. This article highlights those studies, as well as further publications that focus on Dinosaur Isle specimens. Whilst our collection is cited or figured in numerous studies, the specimens are often only briefly mentioned and these papers have not been reviewed in this article.

IWCMS : 2023. 102 *Vectidromeus insularis*

Hypsilophodonts were small to medium-sized, bipedal ornithopod dinosaurs characterised by a relatively short snout, robust maxilla, and heterodont dentition. Their limb proportions—specifically, a relatively short femur in contrast with elongate tibiae, fibulae, and metatarsals—indicate a cursorial (adapted for running) lifestyle. These features, combined with cranial morphology, suggest hypsilophodonts were low-level browsers (Weishampel *et al*., 1990).

Hypsilophodon foxii, originally thought to be a juvenile iguanodont, was discovered near Cowleaze Chine on the southwest coast of the Isle of Wight (Martill & Naish, 2001). Reverend William Fox, a local amateur palaeontologist, argued that advanced skeletal co-ossification in the specimen indicated it represented a distinct, smaller species of *Iguanodon*. Although his observations were initially dismissed by Richard Owen (the founder of the Natural History Museum, London), Thomas Huxley later used Fox's specimen to formally describe the new genus and species *Hypsilophodon foxii* in 1869 (Martill & Naish, 2001).

Over the subsequent 150 years, numerous partial and near-complete skeletons of *Hypsilophodon* have been recovered from the same region. These specimens are typically found within a thin, silty mudstone near the top of the Wessex Formation. The abundance of individuals within this restricted stratigraphic horizon has led to interpretations of the layer as a flood deposit that may have entombed a herd of animals (Martill & Naish, 2001).

Vectidromeus insularis, a newly described small hypsilophodontid, is represented by a partial skeleton comprising dorsal and caudal vertebrae, elements of the pelvis, and hindlimbs (Longrich, 2023). Although the specimen is juvenile, it exhibits notable morphological differences from both juvenile and adult specimens of *Hypsilophodon* (Longrich *et al*., 2024).

Stratigraphically, *Vectidromeus* is derived from the base of the Wessex Formation and is approximately four million years older than the *Hypsilophodon* holotype. As such, it is likely that the two taxa were not contemporaneous (Longrich *et al*., 2023). Numerous indeterminate "*Hypsilophodon*" remains in the Dinosaur Isle Museum's collection span various horizons of the Wessex Formation; however, in the absence of overlapping material, they cannot be definitively assigned to either *Hypsilophodon* or *Vectidromeus*.

IWCMS : 1996.153 & IWCMS : 2021.75 *Vectipelta barretti*

Ankylosaurs were a group of small to medium-sized, squat, quadrupedal ornithischian dinosaurs, characterised by their extensive dermal armour. This ranged from small scutes to large spines, sacral shields, and in some derived taxa, tail clubs (Weishampel *et al*., 1990).

Ankylosaur remains have been recovered from the Isle of Wight since the mid-19th century (Blows, 2015). Following the description of a relatively complete specimen in 1865 *Polacanthus foxii* (Owen, 1865), numerous partial skeletons and isolated bones attributed to *Polacanthus* have been excavated. In the 1990s, a new ankylosaur specimen was uncovered and more recently described as a distinct taxon: *Vectipelta barretti* (Pond *et al*., 2023) (Fig.1).

Both *Polacanthus* and *Vectipelta* possess a sacral shield, a large flattened structure composed of co-ossified osteoderms overlying the pelvic region. When *Polacanthus* was first discovered, the sacral



Fig. 1: The remains of *Vectipelta barretti* laid out, with large spines in assumed positions. Smaller osteoderms, ribs and other fragmentary remains were not used in the reconstruction. Scale bar = 1 metre

shield was initially misidentified as the plastron of a large turtle due to its superficial resemblance (Hulke, 1881). In both taxa, dermal armour likely extended along the back and flanks, with larger spines positioned over the shoulders, decreasing in size posteriorly and laterally (Pond *et al.,* 2023).

However, *Vectipelta barretti* can be distinguished from *Polacanthus* by several morphological differences, particularly within the vertebral column. A phylogenetic analysis of *Vectipelta* has positioned it as a sister taxon to Ankylosauridae, indicating a closer evolutionary relationship to certain Chinese ankylosaurs than to polacanthids. This finding provides potential new insights into ankylosaur dispersal tns during the Early Cretaceous. However, this interpretation may be influenced by the fragmentary nature of the available material (Pond *et al*., 2023).

IWCMS : 2018. 44 *Eodortoka* cf. *morellana*

The origin of turtles can be traced to the Late Triassic, approximately 210 million years ago (Lyson & Bever, 2020). Over the course of around 70 million years, stem turtles gradually diverged from their diapsid ancestors. This evolutionary trajectory involved significant morphological changes, including trunk shortening, broadening of the ribs and gastralia, and the incorporation of metaplastic bone into the evolving carapace and plastron. These modifications culminated in the complete enclosure of both the pelvic and shoulder girdles within the shell (Lyson & Bever, 2020). Initial changes likely served to stiffen the trunk, enhancing forelimb power for digging, with swimming adaptations evolving later. It was only after the near-complete formation of the shell that it conferred additional advantages such as protection, structural support, camouflage, and buoyancy (Dziomber *et al*., 2020; Bu *et al*., 2020).

Turtle remains are relatively rare within the Wealden Group but are readily identifiable due to unique morphological traits. These include features such as the characteristic tubercles of *Helochelydra* shell, distinct sutures between the bones of the carapace and plastron, and stout, robust limb elements. As a result, turtle fossils are often distinguishable even among otherwise indeterminate material collected from beach exposures.

A recent discovery from the Wealden represents a relatively complete turtle specimen, preserving the carapace, plastron, vertebrae, scapulae, pelvic girdle, and limbs. This find marks the first documented occurrence of a dortokid turtle in the United Kingdom and represents the oldest known pan-pleurodiran in the country. Despite its completeness, the specimen lacks certain diagnostic features necessary for confident species-level identification and is therefore referred to as *Eodortoka* cf. *morellana*.

Lead–calcite dating of the specimen provides an age estimate of 127 ± 2.7 million years, placing the fossil within the Hauterivian stage. This represents the first radiometric date for the Wessex Formation and offers the most robust chronological constraint for its lower exposures.

This discovery contributes significantly to our understanding of pleurodiran evolution—a group that was once globally widespread but is today restricted to the Southern Hemisphere (Ferreira *et al.*, 2018). Furthermore, the radiometric data offer an important reference point for regional correlation and biostratigraphic studies within the Wealden Group.

IWCMS : 2014.80 *Comptonatus chasei*

Comptonatus chasei is represented by the most complete British iguanodontian skeleton discovered in over a century (Fig.2) and contributes significantly to the growing diversity of ornithopod dinosaurs identified from the Wealden Group on the Isle of Wight. Historically, the island's iguanodontians have been broadly classified into two morphotypes: the large, robust *Iguanodon*, and the smaller, more gracile *Mantellisaurus*. The addition of *Comptonatus* and *Brighstoneus simmondsi* introduces further taxonomic complexity, particularly among mid- to large-sized ornithopods, and raises important questions about the identity of isolated and fragmentary remains.

Although the skeleton of *Comptonatus* is relatively complete—with a broad representation of the major skeletal elements—taphonomic distortion is moderate, and some elements, such as the ribs, are incomplete. Interestingly, no rib was recovered in its entirety, with most preserved only as small, disarticulated fragments.

The fossil remains of *Comptonatus* were recovered from a bed situated high in the Wessex Formation succession, near its transition with the overlying Vectis Formation. In contrast, *Brighstoneus* was discovered in a lower stratigraphic position within the Wessex Formation, and *Mantellisaurus* was



Fig. 2 : An early reconstruction of *Comptonatus chasei* Image length = 7 metres

excavated from the Vectis Formation. Although all three taxa derive from the broader Wealden Group, their recovery from distinct stratigraphic horizons suggests they were not contemporaneous and may have been separated by several million years.

The stratigraphic position of *Comptonatus* is particularly significant for understanding iguanodontian evolution. Its occurrence near the top of the Wessex Formation places it close to the Aptian stage, a period marked by a notable increase in iguanodontian diversity. As such, *Comptonatus* provides valuable insight into the evolutionary trajectory and taxonomic differentiation of ornithopods during the Early Cretaceous.

IWCMS : 2023.124 *Worako yulei*

First recognised by Forbes in 1856, the Insect Limestone of the Isle of Wight is a globally significant conservation Lagerstätte - a geological unit that has unusual preservation, either in exceptionally high quality, or sheer number of fossils. This unit, part of the Insect Bed, consists of indurated calcareous mudstones that outcrop along the north coast of the Island between Bembridge and Thorness Bay. The limestone is interpreted as having formed in a hypersaline lagoon approximately 35 million years ago (Gale, 2019).

The fine-grained, alkaline muds of the Insect Limestone are capable of preserving fossils with exceptional detail, down to the micron scale (Ross, 2014), and occasionally even retain original colour patterning. The assemblage is remarkably diverse and represents a tropical to subtropical forest ecosystem (Ross, 2014), comprising a wide range of insects, other arthropods, vertebrates, molluscs, and plants.

Forbes (1856) compared the Insect Limestone to the insect-bearing limestones of the Purbeck Beds. However, the section he described at Forelands (Bembridge) is now known to be virtually unfossiliferous. It remains unclear whether Forbes collected fossils from the site himself, as no specimens were explicitly referenced in his work.

The first fossil insects were discovered by Edwin A'Court Smith at Gurnet (now Gurnard). In 1874, he published a brief note in *Nature*, and by 1879 had described fossil Branchiopoda (brine shrimp). The first insect formally described from the deposit was *Lithopsyche antiqua*, a butterfly exhibiting preserved colour patterning (Butler, 1889).

In the late 19th and early 20th centuries, Reverend Peter Bellinger Brodie and George William Colenutt conducted extensive collecting and research on the Insect Limestone, publishing numerous accounts and contributing to the impression that the deposit had been largely exhausted (Osborne White, 1921). After a period of limited activity, the site experienced renewed interest thanks to the efforts of Andy Yule, who over the past 30 years has assembled a significant collection.

Worako yulei represents the most recent addition to this assemblage—a new genus and species of planthopper (family Fulgoridae), identified from a well-preserved left forewing. Planthoppers are relatively large, often vividly coloured insects, most common in tropical regions. Typically slow-moving, they can make short hops and are characterised by proportionately large, broad wings that usually cover the length of the body.

An article by Nel & Ross (2024) highlights some recent discoveries made by Andy Yule: three exceptionally well-preserved dragonfly wings. Whilst they are not new taxa, they exhibit more, and different details to the type specimens, including sexual/intraspecific variation.

IWCMS : 2014.95 Spinosaur Brains

Ceratosuchops inferodios was described in 2021 based on a partial cranium and the mid/distal portion of the tail (Barker *et al*., 2021). A recent study of this specimen focuses on the braincase and associated cranial nerve canals, with the aim of investigating potential sensory adaptations.

Spinosaurids, the clade to which *Ceratosuchops* belongs, have frequently been hypothesised as semi-aquatic piscivores—or in some cases, fully aquatic active predators. These highly derived theropods share several characteristic features, including elongate skulls with retracted external nares, neurovascular foramina on the premaxillae (interpreted as pressure-sensitive sensory pits), numerous conical and unserrated teeth, and robust forelimbs (Ibrahim et al., 2020; Barker et al., 2021). The goal of this study was to determine whether such morphological specialisations were accompanied by comparable adaptations in the neuroanatomy.

Computed tomography (CT) scans of the braincase were used to generate 3D reconstructions of the endocast, providing an approximate representation of brain morphology and associated cranial nerves. The resulting data revealed that the neuroanatomy of *Ceratosuchops* was broadly similar to that of other non-avian theropods, lacking any significant deviation or specialised features.

This finding suggests that the ecological shift from a generalist carnivorous diet to a piscivorous lifestyle in spinosaurs did not necessitate major alterations to the brain or sensory systems. While the skeletal anatomy of *Ceratosuchops* indicates adaptations for a semi-aquatic niche, these changes were not paralleled by equivalent developments in neuroanatomy.

Acknowledgements:

As always, Dinosaur Isle Museum is very grateful to the numerous collectors that have dedicated their time to finding these brilliant fossils, and for donating them to the Museum.

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Author: Alex Peaker, Collections Officer (Geology) Dinosaur Isle Museum , Culver Parade Sandown Isle of Wight PO36 8QA

email: alex.peaker@iow.gov.uk

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METEOROLOGICAL REPORT FOR SHANKLIN, ISLE OF WIGHT, 2024

Clive Cooper

Abstract *Shanklin Weather Station was established in January 1947 for the recording of rainfall, and January 1948 for the recording of temperature and sunshine. 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 but it is not currently in use. All averages refer to the Shanklin climate data set 1991-2020. The Met. Office duly completed their inspection on the 12/03/24 and at this point the Precision Thermometer was replaced with the installation of a Vaisala HMT temperature Logger*

The weather for 2024 was remarkable: it was provisionally both the 4th warmest year and the 4th wettest year on record. The winter was the second wettest in a sequence going back to 1983, with 481.8mm of rain recorded. Spring was also very wet; the wettest spring in the series going back to 1983. The three summer months were about average. Autumn resumed the rainy theme by being the 6th wettest. In British Climatology, a period of 24 hours (normally commencing at 0900) in which 0.2mm rain is recorded, is defined as a 'rain day'. 'Measurable rain' is 1mm or more in a 24-hour period; hence 'rain days' will be a higher number than number of days with 'measurable rain'.

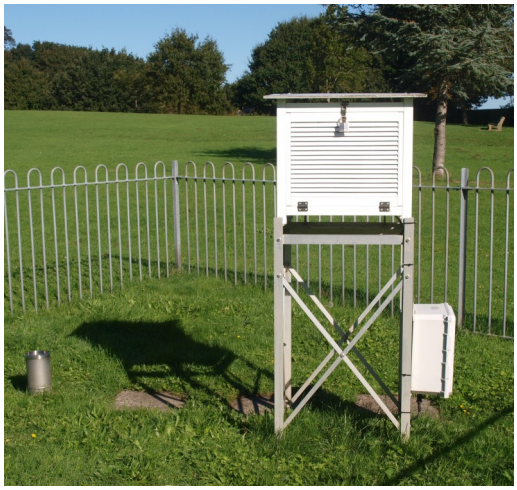


Fig. 1: Shanklin Weather station

JANUARY 2024 started wet and mild with a colder spell from the 5th of the month. The mean temperature for January was 5.94C. This was 0.22C below average and the first month to be below average since August 2023. The warmest day was the 2nd, when 13.0C was recorded. The coldest day was the 13th when the temperature reached 2.7C. The coldest night was the 16th, with an overnight temperature of -4.1C, one of the seven air frosts recorded in January.

The rainfall total was 94.1mm, 90% of its average. Rain was recorded on 12 days compared to the average of 18. The highest amount in a 24-hour period was recorded on the 1st and was 28.9mm.

FEBRUARY

A very mild and wet month. The mean temperature was 8.88C; this was 2.97C above the average. The warmest day was the 18th with 14.5C. The coldest day was the 25th with 7.9C. The minimum temperature was recorded on the morning of the 27th, when -0.4C was logged, the only air frost for that month.

The rainfall total was 209.4mm which was 285% of the average; the wettest February that I have recorded. The wettest days were the 17th with 29.9mm of rain, 6th with 25.0mm, 25th with 22.0mm, and the 8th with 20.1mm. Rain was recorded on 21 days compared to the average of 14.

MARCH

Another mild, wet month, with a mean temperature of 8.80C which was 1.40C above the long-term average. The warmest day was the 20th with 15.0C. The coldest day was the 2nd with 8.2C. The coldest overnight temperature, recorded on the 3rd was -0.3C, the only air frost recorded in March.

Rainfall for March amounted to 106.9mm, 178% of the average. The wettest day was the 1st with 13.7mm. Rain was recorded on 19 days compared to the average of 14.

APRIL

A wet, mild month. The mean temperature was 10.14C, 0.73C above the long-term average. The warmest day was the 6th with 16.5C and the coldest day was the 22nd with 9.7C. The coldest nights were recorded on the mornings of the 21st and again on 24th, when 2.1C was recorded.

The rainfall amounted to 102.5mm, 190% of the average. The wettest day was the 27th with 29.5mm of rain. This followed a dry spell from the 11th till the 24th during which just 6.0mm of rain fell. There were 12 days with measurable rain, which is the same as the average.

MAY

May was a mild and wet month. The mean temperature for May was 13.40C and was 1.09C above the average. The warmest day in May was recorded on the 12th with 20.8C. The coldest day was the 2nd with a recorded maximum of 12.7C. The coldest overnight temperature, recorded on the morning of the 4th, was 5.4C.

The rainfall amounted to 69.1mm, which was 132% of the average. The wettest day was the 13th with 14.8mm recorded. Rain was recorded on 14 days; the average is 11.

JUNE

The mean temperature for June was 14.87C, -0.07C below the long-term average. The mean minimum temperature, at 10.80C, was 0.67C below the average, but the mean maximum temperature, at 18.94C, was 0.53C above the average. The maximum temperature up to the 20th was only 17.73C, 1.21C below the average maximum temperature. Warmer days during the last week helped to raise the temperature above the average. The warmest day was the 25th with 26.8C recorded, one of four occurrences when the temperature exceeded 21.1C. The coldest day was the 13th, with 15.2C recorded. The coldest overnight temperature was recorded on the 9th when 6.5C was recorded. The trend has been for June to have become warmer in recent years, but this year has been an exception.

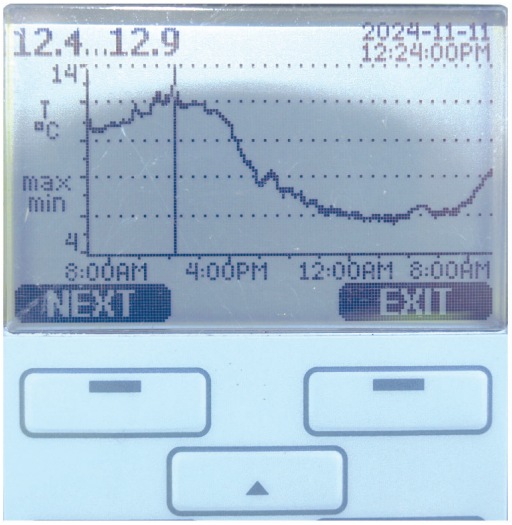


Fig. 2: Vaisala HMT temperature Logger

Rainfall totalled 25.1mm and was 46% of average. The wettest day was the 14th with 12.9mm. Rain was recorded on 4 days, compared to the average of 10.

After the first six months of 2024. the total rainfall was 607.1mm. This was 152% of the 1991-2020 average of 399.0mm, showing that so far, the year had been wetter than normal. Temperatures were also higher than normal, with four months having above average temperature. The six-month mean was 10.34C, against the 1991-2020 average of 9.36C

JULY

Slightly cooler than average, and wet. The mean temperature for July was 16.78C and was 0.27C below the average. The warmest day was the 30th with a recorded maximum of 28.6C, one of 8 days when the temperature exceeded 21.1C. The coldest day was the 7th with a recorded maximum of 16.9C. The coldest overnight temperature was recorded on the morning of the 15th with 9.9C.

July was a wet month with 85.4mm of rain, 163% of its average rainfall. The wettest day was the 15th with 19.3mm, closely followed by the 9th with 15.6mm, of rain. Rain was recorded on 15 days against an average of 9.

AUGUST

A warmer and drier than average month. The mean temperature for August was 17.72C and was 0.53C above the average. The hottest days were the 1st and the 12th with a recorded temperature of 26.7C. There were 10 days when the temperature reached or exceeded 21.1C. The coldest day was the 24th with 17.4C. The lowest overnight temperature was on the 30th, when 10.2C was recorded.

Rainfall for the month amounted to 56.8mm, 85% of the average. The wettest day was the 23rd with 13.6mm. Rain was recorded on 11 days which is the average. August 2024 was the driest August since 2013.

SEPTEMBER

An average month with respect to temperature. The mean temperature for September was 15.12C which was 0.15C below the average. The warmest day was the 1st with 24.3C recorded, one of four days when the maximum temperature reached or exceeded 21.1C. The coldest day was the 27th, when the temperature was 13.4C. The lowest temperature overnight was recorded on the morning of the 13th when 5.8C was recorded.

The rainfall recorded was 165.6mm, 229% of its average. This was the wettest September that I have recorded; the previous wettest was 2000 when 162.4mm fell. The wettest days were the 29th with 29.4mm, 5th with 35.2mm and 26th with 41.3mm. The number of rain days in September was 18; the average is 12.

OCTOBER

Mild and wet. The mean temperature for October was 13.64C and was 1.19C above average. The warmest day was the 16th with 18.2C, the coldest day was the 10th with 12.9C. The coldest overnight temperature was recorded on the 11th when the temperature fell to 4.4C. October 2024 was a mild month and was 10th warmest since my records began in 1983.

The rainfall for October was above average at 131.9mm, 116% of its average. This is the 16th wettest October that I have recorded. The days with the highest rainfall totals were 21st with 20.2, 13th with 19.1mm, 18th with 16.1mm and the 16th with 13.7mm. There were 20 days with rain recorded compared to 15 which is the average.

There was one named storm, Ashley on 20th-21st.

NOVEMBER

An average month for rainfall and also mild. The mean temperature for November was 9.65C and was 0.52C above the average. The warmest day was the 24th when 16.6C was recorded. The coldest day was the 21st when 4.9C was recorded. The lowest overnight temperature was recorded on the mornings of the 21st when -0.1C was recorded, the first air frost of the autumn. The temperature exceeded 10C on 27 days.

112.6mm of rain fell during the month which equated to 95% of the climate average. The wettest days were the 26th with 34.4mm of rain, 24th with 17.0mm, 18th with 15.8mm, and 23rd with 13.4mm.

Sleet fell on the 21st. It turned to snow inland and over high ground, there was 0.5cm of lying snow at Godshill, on the morning of the 22nd, the first time it had been recorded in November since 2010.

Gales were recorded on the 23rd. Storm Bert passed through 22nd -25th and Storm Conall arrived on 27th November.

DECEMBER

A mild month overall and dry, the driest December since 2016 when 39.8mm of rain was recorded. The mean temperature for December was 8.06C, 1.17C above the average. The highest temperature was recorded on the 5th when 13.7C was recorded. The coldest day occurred on the 13th when the temperature only reached 6.3C. The lowest overnight temperature was recorded on the 4th when the temperature fell to 0.7C. This was one of six Decembers, all of which have occurred since 2011, that have been frost free.

Rainfall amounted to 64.6mm and was 54% of the climate average and it was the 10th driest December in the last 42 years. The wettest day was the 4th with 21.9mm. There were 16 days with rain recorded; the average is 16.

There was a very windy spell on 7th and 8th, both with gales recorded. In contrast, the Christmas period was dull with fog.

Author: Clive Cooper, Meteorological Recorder
20, Newport Rd, Godshill PO38 3HR

Table 1: MONTHLY WEATHER SUMMARY FOR SHANKLIN – 2024

MONTH	AVERAGE TEMP. C	MEAN MAX. TEMP. C	MEAN MIN. TEMP. C	RAINFALL MM
JANUARY	5.94	8.35	3.53	94.10
FEBRUARY	8.88	11.02	6.74	209.40
MARCH	8.80	11.29	6.30	106.90
APRIL	10.14	12.98	7.29	102.50
MAY	13.40	16.85	9.95	69.10
JUNE	14.87	18.94	10.80	25.10
JULY	16.78	20.10	13.47	85.40
AUGUST	17.72	20.78	14.65	56.80
SEPTEMBER	15.12	18.26	11.97	165.60
OCTOBER	13.64	16.04	11.23	131.90
NOVEMBER	9.65	12.18	7.11	112.60
DECEMBER	8.06	10.13	5.99	64.60
YEARLY FIGURE	11.915	14.74	9.09	1224.0

OBITUARY: ANN CAMPBELL (1931-2024)

Ann was born to Clifford and Audrey Corbett on the 1st August,1931 at "Sunnydell" on the Mall in Brading, a house designed by her architect father and built by his father-in-law's building firm. She started school at Linden College in Shanklin, a small private school of less than forty pupils followed by Ryde Secondary School at eleven.

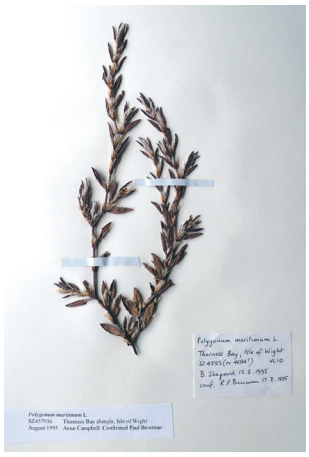


She had a passion for nature from an early age, spending hours alone on Brading Down and the marshes with her sketchbook, discovering wild flowers, birds and other fascinating creatures. Art was another passion and many of the plants and creatures found were drawn in incredible detail. She had a formidable knowledge of wild flowers, and an entry in the County Press in 1945 described how, at the age of 13, she discovered the Island's first Early Spider Orchid for many years.

After passing the School Certificate, Ann went on to the Sixth Form at Sandown Grammar School, where she first met her future husband, Ian Campbell from Ryde. She trained and qualified as a teacher at the C.F. Mott College of Higher Education in Liverpool, whilst Ian was at Forestry School in North Wales.

The couple returned to the Island and married on 10th April 1952 Their first home was a keeper's cottage in woodland near Havenstreet, a huge difference from the family home in Brading. There was no gas or electricity, and meals were cooked on two primus stoves! A tin bath hung outside the front door. Their eldest son Peter was born in 1953. Alastair, Victoria and Cicely followed after the family moved to Calbourne and later to a house on Hamstead Drive at Ningwood. A move to Longcross in the New Forest followed in 1960, and James was born in 1961. They spent seven years there, amongst the heathlands and ancient woodlands, where Ann took delight in finding rare plants and creatures. She found time to resurrect her love of painting, especially in oils, and showed some of her works in a small art shop in Lyndhurst where they sold well. She took a keen interest in her children's schooling, and she never stopped learning herself, even finding time to go to evening classes. Ian's career progression resulted in further moves to Norfolk, Northamptonshire, Ayrshire in Scotland, Cannock Chase and Devon, with the children growing up and leaving home along the way.

The couple retired to the Island in 1988, to live in Bembridge. Ann joined the Society and began recording the local flora. The Botanical Society of Britain and Ireland was embarking on a national survey of plant distribution for the Atlas 2000 project and Ann systematically worked through sites in the East Wight; in total, the IWNHAS database holds 8575 records in her name. She was a meticulous recorder and would always send full details of unusual plants, together with a pressed specimen.



Particularly noteworthy finds include the first record of Sea Knotgrass, *Polygonum maritimum,* on the Island since 1870. She found 141 plants on the shore at Thorness Bay in 1995 and it became a place of pilgrimage for botanists. Sea Knotgrass gradually declined until it was last seen in 2002. She made the first modern Island record of Basil Thyme, *Clinopodium acinos,* in an old quarry on the north side of Brading Down in 1997. Always a rare plant, it has not been re-found here since 1998 despite much searching. She found Cat-mint, *Nepeta cataria,* on brackish land below Embankment Road, Bembridge, in 1998. There have been no further Island records. She liked to keep an eye on rarities local to her, in particular Yellow Bartsia, *Parentucellia viscosa* and Slender Tare, *Ervum gracile* from the slumped cliffs at Forelands. At the time, Forelands was the only known Island site for these species.

When the botany group began the project to reinforce the population of Wood Calamint in 1999, Ann compiled species lists of the plants growing in the immediate vicinity, and it was she who raised a couple of Wood Calamint seedlings from a soil sample taken from the site in an experiment to investigate the seed bank. Consequently, she took on the task of raising plant plugs from Wood Calamint seed collected under licence each year. A total of 488 plugs was planted out between 2009 and 2019, allowing sub-populations to establish and improving the plant's survival prospects.



After Ian passed away in 2017, Ann stayed on at the family home and celebrated her 90th birthday with her children, six grandchildren, and four great-grandchildren and other relatives present for a very happy day. After a few months of illness in 2024, she had a short time at the Elms Nursing Home in Bembridge where she died peacefully in her sleep on August 30th, shortly after her 93rd birthday.

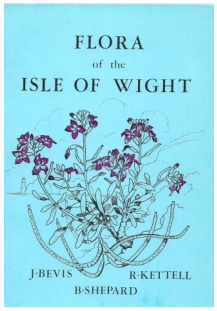
Compiled by Anne Marston with material supplied by Peter Campbell and Colin Pope

Photos: **Top**: one of Ann's drawings **Middle:** Ann's herbarium sheet for Sea Knotgrass. **Bottom:** Ann at Wheeler's Bay 1999

Proc. Isle of Wight Nat. Hist. Archaeol. Soc. ***39***, *97-98 (pub 2025)*

BILL SHEPARD 1921-2024

Bill was a familiar figure in the Isle of Wight Natural History and Archaeological Society for many years. He had long-standing interests in birds, beetles, botany and local history, and memories of him are numerous. Above all else, he is remembered as one who encouraged and mentored all who shared his interests.
Here we present a selection of memories in acknowledgement of his contribution to Island life. His catchphrase *"Well, I'm blessed"* was often heard, and we have certainly been blessed by knowing him.

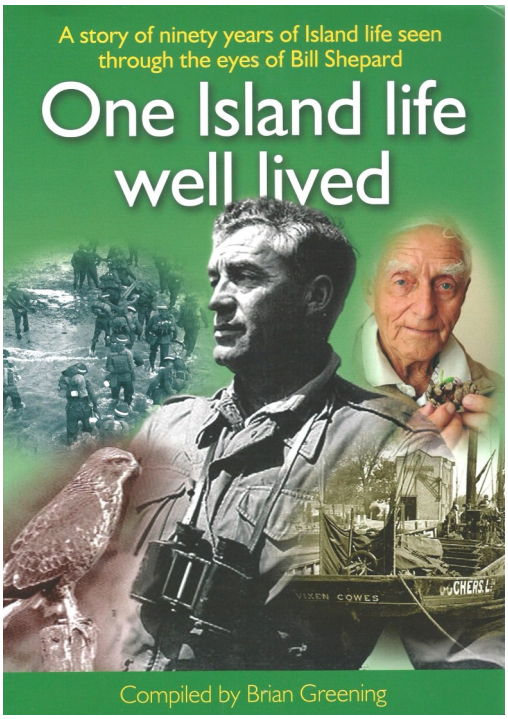


Bill was the vice-county recorder for the Botanical Society of Britain and Ireland (BSBI) from 1973 to 1994. Together with Jim Bevis and Reg Kettell, he compiled thousands of records based on extensive field surveys to produce the *'Flora of the Isle of Wight'*, published in 1978. A supplement to the *Flora,* and a series of Habitat Studies, were produced as a follow-up to this publication. Bill's contributions to the *Proceedings* are listed at the end of the article.

He was always interested in different field techniques and methods of recording wildlife. Hearing of a snorkelling expedition in Bembridge Harbour lagoon to locate the Foxtail stonewort, *Lamprothamnium papulosum,* Bill suggested an abseiling trip over the edge of West High Down to search for Oxtongue Broomrape, *Orobanche picridis*!


Veterans Trail
Veterans Trail
Champions Churchyard
Veterans Trail
Poets Pines
Veterans Trail
Parks Parasols
Veterans Trail
Cascading Canopies
Veterans Trail
Kings Dragons
Veterans Trail
Legends Landscapes
Groves Gardens
Veterans Trail
Veterans Trail
Veterans Trail

In 2012, Bill and Brian Greening published a book 'One Island Life well lived' - A story of ninety years of Island Life seen through the eyes of Bill Shepard. The final pages include tributes to Bill - one of them is printed below. It was written by Susan Telfer in 1992, giving her personal thanks for his selfless hours of education.



The Flower Man

When I am old, before I turn to dream,
And let go of life, forsake the ceaseless stream,
I will take a final walk inside my head,
And say farewell to where the Flower man led.

To where the quiet copse held a Ransom's breath,
Which mixed with bluebells, whispered winter's death,
Or up the sun-kissed cliff top, sea breeze steep,
Through cowslip broidered beds spread ankle deep.

Remember Gromwell, new found and first seen,
With sweet Stellaria twinkling in the green,
Share blue-eyed alkanet's unblinking gaze,
Bent seaward where the Fulmars float on haze.

And all the days of summer still and hot,
Merge in one moment, and sigh, forget me not.

The day I heard the Flower man had left
I wandered to his meadow, thoughts bereft,
And everywhere I looked I heard his voice
The gentle teachings taught from his life's choice.

Veronica, Fairy flax and Gorse,
I heard him say 'It's echium of course",
And since that day he left it's been the same
For every flower I pass now calls his name.

My final walk before my time to go,
Will be past every flower that I know,
And when the trumpet blows across the stream,
I'll follow where the Flower man's been.

Brush through the nodding grasses that he knew
And follow friendship's footsteps up to Rew.

Bill's legacy in print

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Kettell, R., Shepard, B. & Bevis, J., 1977. Habitat Studies No 1:the flora of the River Medina. *ibid.* **7** (2), 101- 106.
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Shepard, B. & Greening, B., 2012. We remember it well Crossprint, Newport.
Shepard, B. & Greening, B. ,2012 .One Island life well lived. Short Run Press Ltd., Exeter.

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.

Technical guidelines for submission of material

Title Page

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.

The affiliation(s) of the author(s) if applicable, i.e. institution, department.

A clear indication and an active e-mail address of the corresponding author.

If applicable, the 16-digit ORCID of the author.

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 five 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.

Headings may be used, but no more than three levels.

Abbreviations should be defined at first mention and used consistently thereafter.

Scientific style Genus and species names should be in italics, with taxonomic authority at first mention and/or reference to an authoritative classification/ catalogue for example *World Register of Marine Species* (WoRMS).

Measurements All measurements should be given in SI units. When referring to measurements in older literature, imperial values may be quoted together with the SI equivalent.

Numbers 1-9 should be given in words; 10 and over as numerals.

Citations References should be cited in the text by name and year in parentheses e.g. Smith (2001). A separate list of references should be supplied.

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. The ISBN does not need to be quoted

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.

If there are more than three authors, the first three should be given, followed by 'and x others' where x is the number of other authors..

The actual publication date of an individual journal volume should be cited 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.

Quotations from other sources Substantial quotations within the paper from other texts (i.e. over 2 lines) should normally be in italics, substantially indented and separated from the main text by a line space at both the beginning and end of the quotation. Shorter quotations in the body of the text should be within single apostrophes.

Tables

All tables should be numbered using Arabic numerals and be cited in text in consecutive numerical order e.g. **Table 1, Table 2.**

For each table, a table caption (title) explaining the components of the table should be supplied.

The table function, not spreadsheets, should be used to make tables.

If any previously published material is included, the original source, in the form of a reference at the end of the table caption, should be given.

Artwork and photographs

For the best quality final product, submit all artwork, whether photographs, or line drawings, in an electronic format as separate files. The following formats may be used: JPG TIFF and BMP.

Figures

When preparing figures, it would be helpful if they are sized to a width of either 85 mm or 175mm. When the layout is done, the figure will be inserted into the article as considered appropriate by the designer.

For black and white graphics, all lines should be at least 0.1 mm (0.3 pt) wide and all lines and lettering within the figures must be legible at final size. Scanned line drawings should have a minimum resolution of 600 dpi.

For photographs, drawings, or paintings with fine shading, etc. a minimum resolution of 300 dpi is recommended. Scale bars within the figures should be included where possible.

Figure Numbering

All figures should be numbered using Arabic numerals. The figures with their captions should be included into the running text as well as being supplied as separate files. The figure source files should be identified as Fig 1, Fig 2 etc but these files should not include the captions.

Figures should always be cited in text in consecutive numerical order, with figure parts if applicable denoted by lower case letters (a, b, c, etc.).

If an appendix appears in the article and it contains one or more figures, continue the consecutive numbering of the main text.

Figure Captions

Figure captions begin with the term Fig., followed by the figure number, in bold type. e.g. **Fig. 1**

Each figure should have a concise caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file itself.

No punctuation should be included after the number or at the end of the caption.

Use Calibri or Arial (sans serif fonts) to add lettering. Keep a consistent size for lettering throughout the final-sized artwork, usually about 2–3 mm (8–12 point).

Use boxes, circles, etc., as coordinate points in graphs and provide a key for each symbol

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