THE EXCAVATION OF THE FIRST PIPED-WATER SYSTEM AT NEWPORT, I.W. AND ITS ASSOCIATED URBAN PALYNOLOGY.

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Abstract:

An excavated portion of an elm water main system is attributed to the work of named Stuart contractors of the period 1618 to 1623. The excavation also revealed a medieval deposit including building materials which are tentatively attributed to the destruction of the borough of Newport in 1377. A spot sample of the medieval pollen spectra yields localised archaeo-environmental evidence which is compared with documentary evidence for traditional activities later recorded within the town.

Documentary evidence

On 16th October 1618 a lease was granted to Phillip Fleming *for the breaking of anie place or places in the Streets & Waies within [the] Towne & libertie [of Newport] for the convenient carryeing and conveying of wholesome spring water. . .* This project, recorded in the Newport Borough manuscripts (MSS 45/16a f 113), describes the first attempt to provide the principal town of the Isle of Wight with a piped water supply. The enterprise was funded at least partly by subscription and was intended to convey the wholesome spring water *into everye mans house that shall compound with the said Phillip for the same. A Cesterne or receptacle for the said water* was to be constructed *in any convenient place within this Towne* and the supply was to be available within three years.

Phillip apparently encountered difficulties in meeting the requirements of his contract and on 18th June 1623 a new licence was granted to Andrew James the younger *to dig and breake the streetes to bring water into and through [the] Burrough and to build Cisterns or Cisterne howses and other convenient Receptacles for the same water, under such provisions convenantes and agreements as was latelie graunted by the Maior and Burgesses of this Burrough to Phillip Flemminge Esquire,* (Newport Borough MSS 45/2 f 54v). This second attempt to convey piped water was probably successful although later the system had evidently been abandoned when the borough recorded on 12th December 1662: *that Mr Nicholas Chestle shall have the stones of the cisterne house in the beast market* (Newport Borough MSS 45/166 f 155)

The earliest plan of Newport dates from 1611 and shows a rectilinear medieval street grid (Speed 1611). The frontages on the main thoroughfares are well infilled with houses but the interior of the street blocks retain a patchwork of random orchards, gardens and plots as yet undivided into narrow burgage strips aligned on the individual houses. The streets and plots are bounded in places by walls which are represented on the map by double lines (fig.1). A recent survey of extant stone walls (Basford 1980) shows a high degree of conformity with those represented in 1611 and we may therefore assume considerable accuracy in John Speed's plan.

Speed conveys a growing town ripe for municipal improvement. The infilling of the street frontages may be reconciled with the expansion of the town's population which by

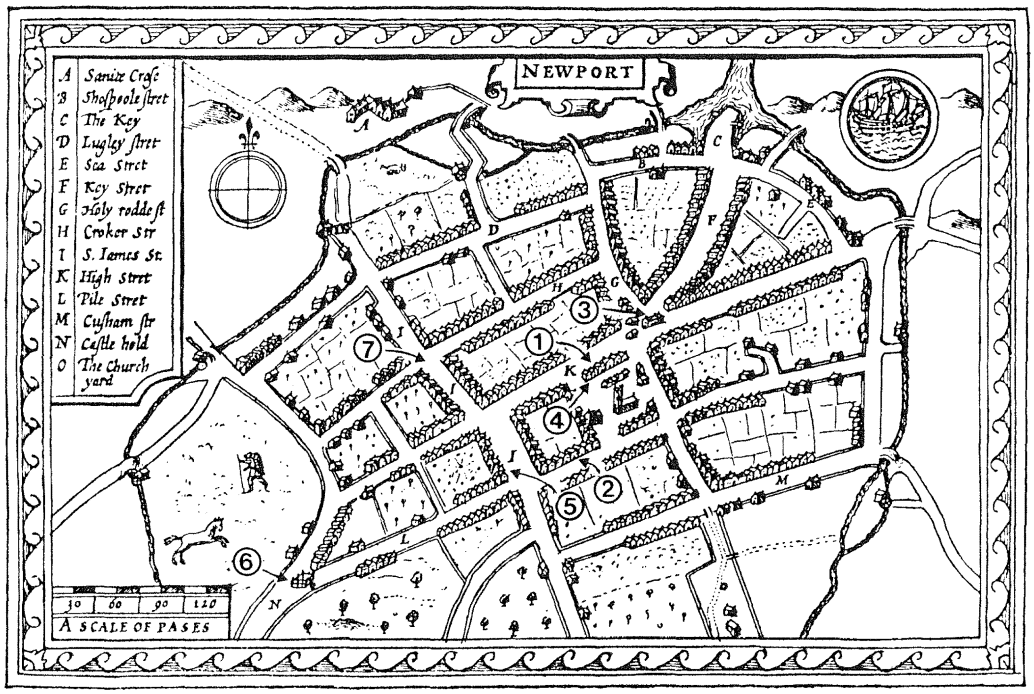

Figure 1. John Speed's map of Newport from *The Theatre of Empire of Great Britaine*, 1611.

Features cited in the text are:–

1. High Street pipe section, 1980.
2. Pyle Street pipe section, 1935.
3. The Fish Shambles.
4. The Flesh Shambles.
5. The Beast Market and site of the stone reservoir and well no. 4.
6. The Town Well (well no. 1).
7. Well no. 2

1641 had nearly trebled in less than a century to provide a total of *three Thousand soules* (Newport Borough MSS 45/16a f 406, February 1640/41; Jones 1977: 118). A further improvement of the Stuart period was the new Purbeck Stone town hall which replaced the old audit house in 1639.

The sources of water

Although the positions of public wells are not indicated on Speed's plan some may be located by reference to the town's terrar surveys of 1563 and 1651 and later records. Public wells appear to have been sunk at major street intersections. Their distribution suggests that they were primarily intended to serve the inhabitants of the south-west sector of the town who were ill-placed to make ready use of the Lukely Brook or the fresh water section of the Medina. Four wells are known and are indicated in fig.1.

1. The main town well is that still surviving under the pavement at the junction of Pyle Street, High Street and Carisbrooke Road. Apparently dug in 1818, it is too late to

have served the pipe system (Newport Paving Comm. 45/195; IW Records Office). In the 1563 terrar Survey the site is noted as the pound but the source of water for impounded animals not stated (Webster MS 5). It is included in a description of Deadmans Lane which is recorded as leading to the pound. A careful inspection of John Speed's map shows the pound surrounded by a rectangular arrangement of rails. Despite its low elevation the town well seems to have been constructed to obviate the effects of even the most severe drought. A total depth of 119 ft. was later recorded with 90 ft. of water observed. (Eldridge 1952).

2. The well at the crossroads of St. James Street and Lugley Street is cited in the Newport Terrar Book of 1563 (Webster MS 18). No trace survives.
3. A well also seems to have once been used *at the top of South Street* (Eldridge 1952). It is perhaps, like the town well, now preserved beneath the pavement.
4. The former existence of a well has also been cited in the 'beast market' in St. James Square. This may have been associated with the large reservoir which was apparently built of stone and was rediscovered here in the late 18th century '*whilst digging for stone for the purpose of paving the streets*' (Albin 1795:324–5).

Alternatives to well water were the Lukely and Medina streams. Their confluence with the tidal estuary presented problems of salt pollution which in the 16th century even permeated the town's beer (Jones 1978: 133).

The pipe system

The extent of the Stuart pipe system may be conjectured with the aid of documentary sources and archaeological observation. Two main routes of the pipe system are known.

Pyle Street

Some of the earliest finds were recovered in 1935 during drain laying for the premises of Upward and Rich. A number of short lengths seem to have been sawn from the wooden pipe on this occason and two examples have since found their way to Carisbrooke Castle Museum. A further sawn sample has also been preserved by Mr. A.J. Westmore and at least two others were discovered stored in the basement of a house in Pyle Street when the building was demolished in 1979 to make way for the new International Stores. The samples of the Pyle Street pipe average 30 cm. in diameter and show a bore of 10 cm. The boring along the trunk was made off-centre to avoid the heartwood.

High Street.

A substantial portion of the High Street pipe was uncovered by Southern Gas on the 29th March 1980. Southern Gas kindly permitted an investigation by the Isle of Wight Archaeological Committee which resulted in the first examination of a pipe junction and the preservation of 2.5 metres of pipe. The two pipes in the High Street section vary a little in their overall diameters. The preserved pipe is 30 cm. in overall diameter and has a bore of 13 cm. The west end of the pipe was tapered and shallowly inserted into a large elm pipe of 35 cm. overall diameter (fig. 2 and plate 1). The exposed junction was fitted with a flanged collar formed from a crimped lead sheet. The underside of the collar had completely disintegrated leaving only a lead oxide stain. No securing nails were found. The complete length of the individual pipes remains unknown. The thick pipe was penetrated with a sweep's rod for a distance of 3.7 m. where a blockage was

encountered. The course of the narrow pipe was uncovered for a distance of 4.7 m. but its eastern end was found to have been destroyed by an earlier road repair. In the repair backfill, particles of a destroyed lead collar suggested an overall length of some 3.5 metres. The different bores of the Pyle Street and High Street pipes may perhaps be attributed to the two respective attempts by Fleming and James at pipe laying in 1618 and 1623. The method of pipe coupling may also differ but we must await confirmation from future inspection of the Pyle Street pipe.

Pipe construction

Due to the marked contrast in overall diameters it appears that two types of complementary pipe were employed in the High Street main (fig. 2). Both ends of the thick pipes were probably fitted with female junctions while each end of the thin pipes were correspondingly tapered to form male ends. The pipes therefore appear to have been laid alternately along the street. This arrangement appears to contrast with the method used in 17th-century London where each pipe possessed both male and female ends. The London pipes appear in a contemporary illustration showing a trunk route of 4 pipelines crossing the Fleet (King & Staples 1949: 18). Such pipes seem to have been welcomed as an alternative to their short-reach interlocking ceramic predecessors which are known in thirteenth-century contexts at Brooklands, Weybridge and the Laverstock kilns (Hanworth and Tomalin 1977: 61, 66 and 72; Musty 1969: 141–142).

An illustration from John Evelyn's '*Sylva*' dated 1670 shows the construction of wooden pipes on a lathe bench. The craftsman has at his disposal a variety of iron augers which he is able to fit to a drive geared to a waterwheel.

The life of the pipes

Depending on the soil in which they were laid, the useful life of wooden pipes seems to have varied from under 4 years to 25 years (King & Staples 1949: 18). In Newport High Street the subsoil comprised stiff grey clay, a material conducive to pipe survival. If completed it seems unlikely that the pipe system functioned any longer than the optimum 25 years. The record of the demolition of the cistern house in the beast market in 1662 makes no reference to renewals and it seems that by this date the system was already defunct. By 1795 the entire system had not only been abondoned but completely forgotten. Albin comments *this town, it is discovered, was formerly supplied by water for which purpose there was a large reservoir in the beast market . . . It is greatly to be regretted that such work does not now exist.* (Albin 1795: 324–5). By this date the town appears to have reverted to the usual public and private wells and no mention is made either of the Lukely or Medina streams which by now were presumably polluted. Albin remarks that the town might be *supplied with the most excellent water from a spring at Carisbrooke, not half a mile from it, at easy expense.* The wells may have been supplemented at this time by private reservoirs such as the circular brick structure revealed during the demolition of the 18th-century Boots the Chemists building in the High Street in April 1980.

The Medieval and later stratigraphy

The pipes recovered in 1980 were entrenched through earlier deposits of medieval age containing much 'midden' material comprising shell, bone and substantial quantities of burnt slate (fig. 3). This material (level 2) was enclosed within black clay (5Y2.5/2) varying from 10 to 30 cm. in depth and resting directly on the natural clay of the neighbourhood (level 1). This midden material is tentatively ascribed to the late

Figure 2. The 17th century elm pipe at Newport High Street, 1980. The male tapered end is secured with a lead collar.

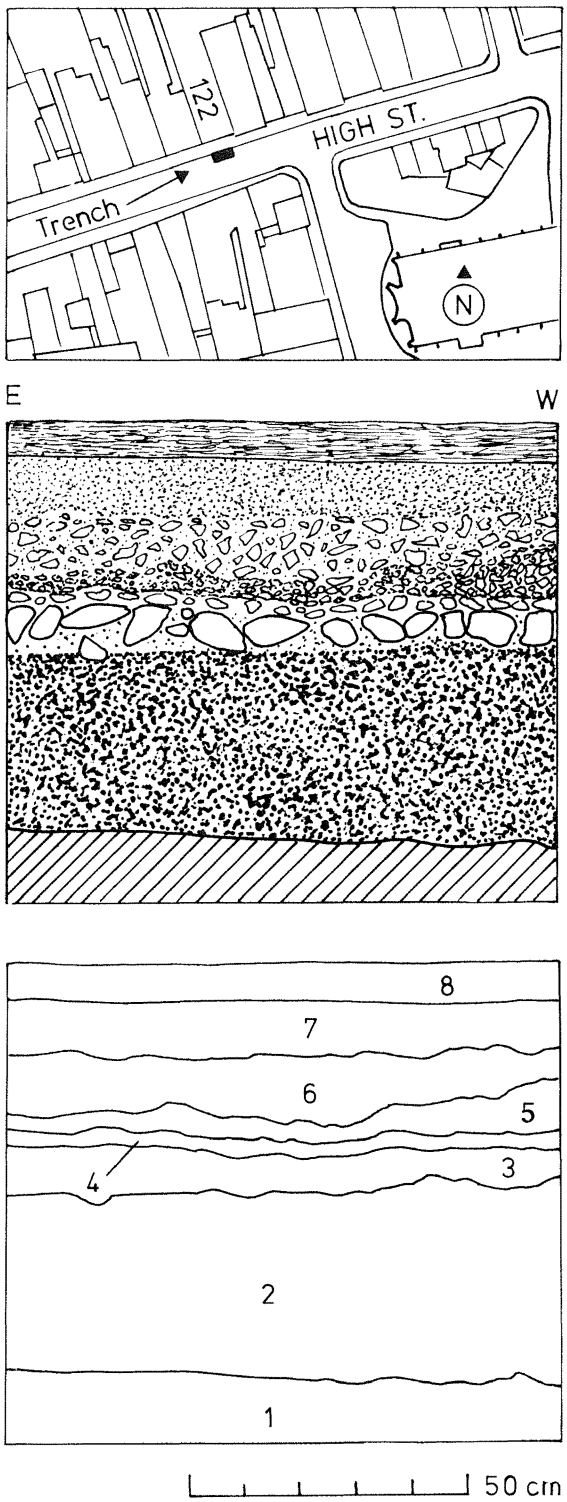

Figure 3. The Newport High Street section. The numbered levels refer to the text.

Plate 1. The first piped-water system at Newport, Isle of Wight. Section of the elm water main with lead collar junction, laid 1617–1623. (Newport High Street 1980) *Photographs Les Allan.*

fourteenth century. The midden deposit was overlain by a single layer of flint nodules (level 3) covered by a thin deposit of scattered chalk particles some 2 cm. deep (level 4).

Level 5 comprised a blackened gravel (2.5YN2) between 6 and 10 cm. thick which appeared to descend into the backfill of the Stuart pipe trench. It was overlain by a well-compacted dark brown gravel (10YR3/3) some 15 cm. thick supporting a road surface metalled with impacted chalky flint modules (level 6). This level post-dated the insertion of the Stuart pipes. The uppermost deposits comprised a modern cemented aggregate sealed with a tarmacadam surface.

It would appear that three old road surfaces are represented in the section, the earliest being the level 3 road which post-dates the midden. During this first attempt at metalling, flint nodules were probably obtained from the chalk downs immediately south of the town. This event seemingly post-dates the comments of Sir John Oglander (1585–1655) who describes the streets of Newport as unpaved *since my memory* although a View of Frank Pledge for 12 October 1573 records the presentment of William Kenneth for *taking up stones out of the high waie in Lugley St.* (Newport Borough MSS 45/21, f 155; Jones 1978: 131). There follow at least two further attempts at road metalling during which estuarine gravel was probably dredged from the nearly Medina. It is possible that further layers of periodic gravelling remain undifferentiated in levels 5 and 6.

Pollen Analysis

A single pollen sample was taken from the upper portion of level 2 where medieval midden deposits overlay a scatter of burnt roof slates. Standard pollen preparation techniques were used for the extraction of the pollen. A sum of 300 pollen grains excluding spores was counted and calculated as a sum of total pollen (TP). The total of 41 taxa recorded is listed in Appendix 2.

This pollen spectrum is dominated by high herbaceous totals (82% TP) and correspondingly low arboreal (13.7% TP) and shrub totals (4.3% TP).

a) *Arboreal pollen*: is dominated by *Quercus* (Oak) (4.3% TP) and *Pinus* (Pine) (6.7% TP). It was noted, however, that a dual preservation character was present. *Pinus, Picea* (Spruce) and *Tilia* (Lime) all exhibited badly degraded pollen exines, whereas *Quercus, Betula* (Birch) and *Alnus* (Alder) were more consistent with the remaining pollen taxa. The former group is undoubtedly of earlier date being derived from underlying but intermixed interglacial river terrace deposits (River Medina). This is substantiated by the presence of *Picea* pollen otherwise unexpected in such urban medieval contexts. The low frequencies of the contemporaneous group are dominated by *Quercus*. Whilst it is equivocal to discuss the origins of these elements it may be conjectured that these taxa are representative of forest growth on Palaeogene clay areas. There is substantial evidence (Scaife 1980) showing that by the thirteenth century, the only remaining areas of extensive woodland/forest in the Isle of Wight existed to the north of the chalk ridge from Parkhurst to Newtown Creek, and at Borthwood. In addition smaller areas of deciduous woodland existed in the eastern part of the Island, and much alder carr woodland remained in valley mire communities. It is likely, therefore, that the low *Quercus* and *Alnus* pollen totals reflect firstly the very local nature of the pollen input to the sample and secondly a more general trace of pollen from relatively distant arboreal communities.

b) *Shrubs*: Dwarf shrubs have been included in this category. Low pollen frequencies of *Corylus* type (Hazel) and an individual record of *Prunus* type may also be attributed to regional pollen 'fall out'. Ericaceous shrubs – *Calluna, Vaccinium* and Ericales spp. are, however, more enigmatic types. Although these genera may have derived from natural dispersion it seems plausible that they are the result of indirect anthropogenic introduction into the sample.

c) *Herbs:* These are represented by a diverse assemblage of herb pollen taxa amounting to 82% of total pollen. These are further divisible into a number of ecological and ethnobotanical categories:

i) The preponderant types are those of urban ruderals. While it is not possible to separate all pollen to lower taxonomic levels, it is evident that such groups as *Linaria*, *Taraxacum* type (including numerous genera) and *Plantago lanceolata* were common and may perhaps have been dispersed in much the same manner as those reprehensibly cast in the street by Robert Fuller in 1592 (Hillier 1860, II: 24).

ii) Arable pollen and associated types; Cereal type pollen (generally larger than 50 microns with large pore/annulus ratio) represent 8% TP and may be associated with Cruciferae (*Hornunqia* and *Sinapis* types), *Polygonum aviculare* and *Centaurea cyanus*. These pollen taxa are likely to be a secondary anthropogenic introduction to the sediments. Evidence of cereal pollen in urban contexts has been discussed (Greig 1981, 1982; Scaife, 1982, 1987a; Scaife *in* Macphail 1981) where relatively high totals appear to have derived from cesspits, animal feed and animal excreta. In the example presented here, it is fortunate that documentary evidence is available – albeit referring to a period a century or so later – showing that corn winnowing in the High Street and the wandering of pigs were common problems within the Elizabethan town. Pollen of this type was no doubt further dispersed by the likes of one Norton who in 1590 was presented to the Bailiffs for *making a mixon nere the churche dore* (Hillier *ibid*). These activities persisted to such an extent that by this time by-laws had been passed restricting them to the outer areas of the town (Jones 1979). It is likely, therefore, that the cereal and allied taxa may be the direct product of such activity. It has also been shown by Robinson and Hubbard 1975) that cereal pollen may be transported in the bracts of cereals. Two caryopses of *Hordeum* (Barley) are noted in Appendix 1 and it seems unlikely that these are similarly related to this discussion. In the latter case, carbonised barley may be a waste product inadvertantly or deliberately thrown onto the street.

iii) The dominant pollen taxon is that of Gramineae (grasses) (40% TP). This is the most enigmatic type due to the lack of taxonomic differentiation created by the generic and species similarity of pollen morphology. Its broad ecological amplitude also creates problems in the interpretation of such high individual percentages. Consequently, only broad inferences can be made, which are based on rather limited understanding of urban environmental and pollen depositional contexts. Gramineae being high pollen producers and of anemophilous nature result in widespread pollen dispersion and become easily incorporated into sediments. This factor may suggest that at least some, if not all, of the pollen may have derived from outside of the urban area from a wide range of grassland communities known to have been present at this time (Scaife 1980, 1987b). Similarly as with the ruderals discussed above, Gramineae spp. would undoubtedly form part of 'waste ground' and 'back garden' flora contributing to the pollen record. Secondary anthropogenic casual factors may be largely responsible for the high Gramineae totals from an almost unlimited range of possibilities. These might include the use of grasses gathered for thatch, production of daub, animal foodstuffs, or from animal dung and floor coverings thrown into the street.

The interpretation of pollen spectra from urban contexts present various problems relating to their mode of origin and to theoretical palynological questions. Interpretations have to be based on an understanding of both natural pollen productivity, the dispersal of urban plant taxa and on the archaeological/archaeoenvironmental connotations which can be placed on a large number of enigmatic pollen types encountered in

such studies. Here, this is clearly seen where cereal pollen can be functionally related to documentary records. This may not, however, be so evident where other cultural pollen types may be represented in the pollen record, e.g. *Linum* (Flax), *Cannabis* (Hemp), *Fagopyrum* (Buckwheat). This problem can become palynologically complicated where taxonomic separation of pollen types to species or even generic level is not at present possible. Further complications in the degree of representation of such a spectrum are increased by the lack of spatial and/or temporal limits which can be placed on an individual sample of this nature. Analysis of sediments from Newport High Street might be expected to provide some evidence for the character of localised 'back garden' crop cultivation in plots of land which we have noted from our study of John Speed's map (1611). The growing of peas, beans, flax or hemp could be expected to give the requisite pollen categories in this spectrum and their notable absence here deserves comment.

Two possible explanations may be that:

i) vegetable crops, flax and hemp were not cultivated during the period represented by this pollen spectrum.
ii) The pollen influx to such an area must be of an extremely local or specialised nature.

The latter viewpoint seems the most plausible, as Dimbleby (1969) has suggested that pollen input to soil pollen profiles is representative largely of an on-site growth. The effects of pollen dispersion must also be influenced by the proximity of the rows of houses shown by Speed along the street. A wider range of samples taken whenever possible should allow the formulation of a better picture of land use in the urban allotments.

Interpretation and conclusion

The archaeological evidence from the Newport High Street section may be assigned to two main periods.

1. The medieval deposits in level 2 (fig. 3) contained butchered beef and mutton bones and substantial quantities of oyster shells all of which are consistent with the close proximity of the fish and flesh shambles as later recorded in the town's terrar survey of 1563. Although no dateable artefacts were recovered from this level a notable quantity of intensely burnt slate from the basal part of this deposit appears to be of chronological significance. The slates closely resemble those of Delabole character which have been excavated in the early Medieval range of domestic buildings within the southern ward of Carisbrooke Castle. The importation of 10,000 slates from Cornwall is recorded in the Castle Accounts for the years 1327 to 1334 (Stone 1891, 1, 76). Further examples of this green roofing slate have also been recovered during fieldwork on the site of the first Nunwell House which was abandoned by the Oglander family after the French invasion of the Island in 1377. The later use of these slates in the Isle of Wight is unattested and there appears some reason to suspect that the Cornish imports may not perhaps have persisted after this date. At Carisbrooke Castle, later buildings are roofed with tiles of terra cotta and Stonesfield limestone and no further record of Cornish slate is evident. In the excavated section of Newport High Street the intense heating and discolouration of quantities of roofing slate seem compatible with the burning and collapse into the street of a large building roofed in the fourteenth-century manner. The survival of this debris in the main thoroughfare of the town might be credibly attributed to a major disaster followed by a period of civil disarray during which the street remained uncleared. The evidence suggests that the destruction level revealed in this section may be the first

archaeological record of the historic burning of the town during the French invasion of August 1377 after which it is recorded that *no tenants were there resident* for upwards of two years (Hillier 1860, 11: 5–6). A particular casualty of the French invasion may have been the owner of the three thousand Edward III and earlier silver pennies, the discovery of whose hoard in 1849 beneath premises in the High Street was noted by Hillier (*ibid*). Corroborative evidence concerning the French invasion should certainly be sought whenever further opportunities to examine the basal level of the High Street occur.

2. In addition to the localised urban environmental evidence attributed to the post-1377 period, the spot sample of arboreal pollen also offers some tentative corroboration of the historical evidence for the progressive loss of woodland habitat outside the margins of the town. For the encroachment of Newport interests on to Parkhurst Forest we may cite some significant documentary milestones. The town's charter given by Earl Richard de Redvers in the later twelfth century gave the burgesses of the borough *pasture in the lands of Parkhurst free of herbage* (Shepard 1984: 5). In c 1264 the Forest retained by the de Redvers family was capable of yielding annually 30 bucks and does, as well as pannage and pasture for 40 swine and pasture for 150 cattle (Hillier 1860, 1: 86). From these entries we may deduce that the pasture cited was still recognised as former woodland. It would also seem likely that at this time some deciduous woodland still abutted the northern boundary of the town at Forest Gate (or Town Gate as it is latterly known) for it is recalled in an Elizabethan document concerning *the auncient usags and olde customes of the Borowgh of Newport* that on *the ffirst Sonday aftor Maye daye . . . it wase an Auncient custome for the Baylie and all his Brethren to meete at the wood ovis in the fforest (a place now not knowne, but it wase the edge of the wood where the hill beginneth to ryse as soone as you ar on hoonye hill; and it was so thicke a wood that a man might goe from tree to tree almost 2 miles in length)* . . . (Hillier 1860, II: 21, quoting from Newport Borough MSS, 45/2).

The Hunny Hill boundary brings the former forest margin to within 500 metres of our excavation in Newport High Street, yet the arboreal pollen obtained from this site offers no significant evidence. From these observations we may suspect that the main incursion into the remants of the borough's adjoining woodland may have been initiated by timber felling to redresss the widespread destruction, by the French, of the town's timber buildings of 1377. After this date over-zealous foraging in Parkhurst no doubt promoted further tree loss so that by Elizabethan times *cuttynge greene bowes indureth for the holie daye, eves, and mornynge times only the May moneth; and people, of custome, owght to goe but once a daye, But sere and broke woode, the said inhabitants of the towne hathe ben accustomed, time owte of mynd, to fetche home att ther Backe wth their pickards from the woode aforesaid, all the yere longe, savinge only the seme moneth; and also to have, by estimaceon, 30 acres of firses and other fewell in the said lanndes wthowt the said woode, all tymes of the yere, wthowt excepcon.* (Hillier 1860, II: 21). With timber always in ready demand it is not surprising to find that in 1559 the townsfolk were honestly able to reply to Sir Francis Knollys' Commission that *we have noo woods, copsis nor tymber within ower lybertie.* (Hillier 1860, II: 15). It seems probable that by this time too, intrusion from the urban fringe had near but extinguished the former indigenous deer population, for William Camden (1637: 273) adds that the Island has *one little forest. . . . and two parkes* replenished *with deere, for game and hunting pleasure.*

3. The Stuart pipe system of Newport marks a period of civic improvement in the early 17th century which is probably commensurate with the expansion of the town's population. The Newport pipe system was laid by two successive contractors and the archaeological evidence suggests that water engineers of this period may have adopted their own individual methods of pipe construction and joining. No evidence for pipe maintenance is known and by 1662 the system was probably defunct.

Site archive

The artefacts and records concerning the Newport High Street water pipe excavation are retained in the Isle of Wight County Archaeological Collection under the primary record number IWCAC 1553.

Acknowledgements

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Appendix 1

Newport High Street – Macroscopic Remains

a) Medieval

Agrostemma githago	seed	2
Chenopodium album	seed	6
Corylus avellana	nut fragments	4
Hordeum vulgare	caryopses (carbonised)	2
Juncus sp.	seed	1
Rubus sp.	thorns	2
Rubus sp.	seeds	3
Rumex (sp. indet.)	achene	2
Trifolium sp.	seed	1
Urtica	seeds	9
Crataequs	spike	1

It is apparent that the majority of types recovered are typical ruderal taxa (e.g. *Urtica*). The relatively low absolute frequencies obtained may reflect the poor incoporation of macro-plant remains into urban street deposits. *Hordeum vulgare* (barley), *Corylus avellana* (hazel) and *Agrostemma githago* are interesting and possibly derive from urban refuse.

b) Wooden water pipe
1 pipe section identified as *Ulmus*

c) Bones present in macro-extraction
Ovicaprid.
Fish (sp. indet.)

Appendix 2

Newport High Street, medieval levels – Pollen Data

	Count	% Total Pollen
Pollen:		
Betula	2	0.7
Pinus	20	6.7
Picea	3	1.0
Quercus	13	4.3
Tilia	3	1.0
Alnus	5	1.7
Corylus type	3	1.0
Prunus type	1	0.3
Calluna	4	1.3
Ericales	3	1.0
Vaccinium	2	0.7
Ranunculus type	1	0.3
Sinapis type	8	2.7
Hornungia type	2	0.7
Caryophyllaceae undiff.	1	0.3
Chenopodium type	1	0.3
Trifolium type	4	1.3
Papilionaceae undiff.	1	0.3
Rosaceae undiff.	1	0.3
Potentilla type	1	0.3
Umbelliferae	3	1.0
Polygonum aviculare	2	0.7
Rumex	3	1.0
Urtica type	1	0.3
Rhinanthus type	2	0.7
cf. Linaria	3	1.0
Scrophulariaceae undiff.	2	0.7
Lamium type	1	0.3
Plantago lanceolate	9	3.0
Rubiaceae	2	0.7
Bidens type	1	0.3
Anthemis type	9	3.0
Centaurea nigra type	2	0.7
C. cyanus	4	1.3
Taraxacum type	27	9.0
Cyperaceae	2	0.7
Gramineae	120	40.0
Cereal type	24	8.0
Unident. pollen	1	0.3
Total Pollen Count	300	
Pre-Quaternary taxa	2	0.7
Spores:		
Pteridium aquilinum	7	2.3
Dryopteris type	5	1.7
Polypodium	1	0.3
Nematodes:		
Trichuris sp.	1	

Appendix 3

Bones

A small sample of bones taken from the medieval deposit was identified by Mr. R.B. Reeve (Institute of Archaeology). This included:-

1 possible individual bovid having cut marks
1 equid tooth
7 fragments of ovid or caprivid having cut marks
1 fish vertebra

These results are consistent with the documentary evidence for the traditional presence of the Flesh Shambles (fig. 1) on the south side of Newport High Street (Jones 1978, 120) where the 'boochers' are cited in 1575 (Newport Borough MSS 45/21 f 191).