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Caves & Tunnels in South-East England

Part 3

Volume Nine

General Notes

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DERIVATION

This is a 2020 electronic copy of a reprint of Volume 9 of the Records of the Chelsea Spelæological Society.
The original volume was published in 1979 and was a Quarto duplicated document. The original stencils are looking rather tired and it is getting increasingly difficult to obtain duplicator consumables. Therefore the opportunity has been taken to re-type the text in machine-readable form using MS Word 2002 and to re-trace the drawings. This has resulted in a considerable improvement in overall legibility.
This revision reformatted for online publication February 2025, primarily to replace the font with a modern, more readable typeface. Paging and indexing is unchanged since the 2020 version, but note this differs from the page numbering of the original 1979 version. MV.

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OTHER PUBLICATIONS

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INTRODUCTION

On a morning in February 1947, in the Surrey village of Mickleham, the local policeman, who was shaving at the time, happened to look out of the window. He was amazed to see a large tree at the bottom of his garden completely swallowed up in a sudden subsidence. The hole thus formed was over 40 ft. deep and the topmost branches of the tree ended up ten feet below the surface. In the next few days the hole was partly filled by rising water, which then drained away.

In 1879 workmen digging an adit in a well at Strood Waterworks in Kent broke into a large, natural chamber, which contained running water. Prestwich (1908) described the finding of similar cavities in wells at Knockholt and Luton in Kent. Also in 1907/8 three separate and apparently natural cavities were breached during the construction of a sewer in a tunnel under Blackheath, London.

It can be seen therefore that extensive beds of chalk in South-east England could well contain natural cave systems. It is a soft, white, friable limestone, outcropping widely throughput the South-east and giving rise to the distinctive landscape of undulating Downland scenery. Many of the classic karst features are present - a streamless landscape, dry valleys, closed depressions, sinkholes, resurgences, springs and so on.

Despite this evidence there are many geographers, geologists and cavers who emphatically deny the existence of any caves in chalk on the grounds of its instability. On the other hand Ockendon, Waltham, Glennie, Fagg, Coleman and Staniforth have all written speculative articles on chalk caves. Staniforth's contribution was the most positive in that he drew attention to the numerous sea caves in the cliffs of the Kent coast.

It is most encouraging to know that the French have also been searching in the chalk of the Paris Basin. In spite of "expert" predictions that any such caves would at most be small and uninteresting, they have located and explored dozens of them, up to two kilometres in length. It is also significant that hardly any of these French caves have naturally occurring entrances: they were invariably found in such excavations as mines, quarries and wells.

A recent publication described some two dozen chalk caves in the Department of Yonne to the South-east of Paris. These range from a few metres in length to 1,800m., and with one or two exceptions all are entered from wells. This has led to the belief that the well diggers found the underground streamways by water divining! The following quote from an article by Queffelle describes the apparent skills of a diviner in finding a cave near Joigny:-

"The risk of error in sinking a well is certainly great. The inhabitants of the valley would certainly be content to have one abnormally high well at the loss of several low ones. The water services of Paris have been trying to sink wells for five years in the same valley. They then asked a diviner to indicate the exact point at which to dig. However the engineer was not convinced, and decided to sink a 30m shaft to one side of the point indicated. At 20m there was no sign of water, so they decided to dig a cross gallery in the direction indicated by the dowser and met the course of an underground river. This at any rate is the story told in the valley and we believe it to be near the truth!!"

One of these *'well caves'* has been visited by the geologist and caver Tony Waltham, who has kindly allowed us to reprint the following extract from his article:-

"A recent visit to the chalk in the Foret d'Othe was a revelation - the chalk caves are not restricted to unpleasant little rifts. This area near Troyes, S.E. of Paris, has a number of caves, and also the Bime des Enfants - a 16m deep, 10m diameter vertical sided pit, which opened up in a cabbage field a few years ago.

The shaft walls are in chalk, except for a thin clay-with-flints layer below the soil, and the rubble blocks any way on downwards.

Nearby the Riviere Souterrain de la Guinand is entered via a 20m well shaft in the courtyard of a derelict farm. The top 5m of the shaft is precariously lined with loose flints, and below it is just cut in unlined chalk. At the bottom it lands in a stream cave. The 200m long cave passage is mostly a classic keyhole in profile, mostly less than a metre wide and three metres high, except approaching the upstream and downstream sumps.

The water is crystal clear, flowing over a clean, slippery, potholed floor of chalk, and down a series of small cascades. There is no sediment on the cave floor, but the walls and roof are covered by a layer of glutinous, brown clay. There is a single tributary passage, also a small keyhole canyon, but otherwise there is a noticeable lack of seepage water."

The point of Tony Waltham's remarks is that these caves are probably not confined to the chalk of France. Harry Pearman, writing in the C.S.S. Newsletter some 15 years ago, remarked that, "*We can now rest assured that cave systems do exist in the chalk of South-East England and it is only a matter of time before they are entered*." These views have recently been confirmed by the exploration of genuine solution (karst) caves, as opposed to sea caves, at St. Margaret's Bay in Kent and at Beachy Head in Sussex.

A number of streams in the chalk region lose their entire flow underground in what are generally known as sinkholes, swallow holes or swallets. These features, of which Mymmshall in Hertfordshire is the best known example, are often cited as evidence of cave development, and it now seems more likely that some of these feed explorable caves. No-one has penetrated these elusive underground streamways, but neither has any serious attempt been made to force an entry by digging.

Intermittent streams or 'bournes' are another interesting feature of chalk regions. When heavy rainfall follows a period of drought, some of the dry risings become active in a short time and some have been observed to emit a strong draughts, indicating a possible expulsion of air from substantial underground cavities.

Geologists use the term 'pipes' to describe fossil solution cavities in chalk infilled with Tertiary sediments. These common features are often seen sectioned in chalk quarries. Usually they are vertical shafts a few feet in diameter and up to 50ft. deep. Irregular pipes and sheet pipes, which are narrow, sediment-chokes fissures, also occur. The origin of pipes is still the subject of controversy.

Most of the caves described in this volume are sea caves, which are formed by the erosive action of waves along joints, faults, fissures, bedding planes and tabular flint seams. The enormous sea caverns on the Isle of Wight are something of an eye-opener, and are certainly the finest natural caves so far located in this region.

It is hoped that this volume of Records will provide the incentive for a closer look at South-East England from a purely speleological point of view. There are loose ends, such as the inaccessible Beachy Head and I.O.W. caves to pursue. Further exploration might involve much digging, but we could follow the French example and locate caves by examining old wells. There are of course numerous chalk sea caves beyond the geographical range of this study.

The Sites

Kingsdown, Kent – sea caves see illustration

Location NGR TR 379465. In the cliffs near Hope Point, south of the army firing range.

Access A public footpath through the range (when it is not in use) gives access to the beach. A notice gives dates and times of firing practice and red warning flags are flown at such times. The caves are normally inaccessible at high tides.

Description A number of joints and clay-choked fissures have been enlarged into caves by marine erosion.

The height of the shingle beach can vary considerably: often concealing cave entrances. The high level cavities in the entrances to some caves are probably the result of erosion during exceptionally high tides at times when large amounts of shingle have accumulated at the base of the cliff.

Nearer the firing range there are two joint-controlled openings measuring 3ft. by 2ft. and 6ft. by 3ft. respectively, which are much too high up to have been formed by the sea. These have yet to be examined due their inaccessible locations halfway up a 70ft. cliff.

Good examples of “pipes” from which the infill has been removed by rain wash, can be seen in the cliff face behind the firing range.

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Pegwell, Kent – sea caves and tunnels see illustration

In C.S.S. Records Volume 6 page 56, reference is made to an article in the ‘*Kent County Journal*’ by Frank Illingworth. This gives a detailed account of a lengthy complex of tunnels with strong smuggling connections, reached by means of a cave entrance in Pegwell Bay.

Harry Pearman visited the area in 1970 and surveyed some 230 ft. of man-made tunnels. But these resemble the above account only so far as the location is concerned. Further visits in 1976 and 1978 have revealed more tunnels and numerous sea caves, but still nothing resembling that described by Illingworth.

In the unspoilt cliff half a mile to the east of the Ramsgate Hoverport there are more than a dozen sea caves in various stages of formation. Nos. 1 to 4 are typical of some of the larger caves in this stretch of cliffs.

Several sea caves, now cut off from the sea, can be entered in the area behind the sea wall at Pegwell Bay - NGR TR 363641. These include No. 5 on the survey, which is the longest cave in the area at 95ft. It consists of a roomy entrance chamber divided into two separate, joint-controlled passages at the rear. This cave can be reached, regardless of tides, by climbing down the cliff face. In the same area are the tunnels described by Harry Pearman in Records vol.6.

More tunnels can be entered near the eastern end of the sea wall. One steeply ascending passage, with steps cut in the floor, has not been fully examined due to lack of light. Another tunnel, about 60 ft. long, connects with a large sea cave that lies just around the corner from the bay. Two more passages lead off from the sea cave: a tunnel extending eastward for several hundred feet is terminated by brickwork; and another about 40 ft. long terminates in a small chamber with a brick dome in the roof.

The final stretch of cliffs between the eastern end of the sea wall at Pegwell and the end of the promenade at Ramsgate (TR 364640) is riddled with caves. In the distance of a few hundred yards there are 14 sea caves of which nos. 6 and 7 are just two examples. Most of them have been sealed off at some time with 18" thick concrete walls. However in most cases these have failed to withstand the constant hammering of the waves and now lie as heaps of rubble at the entrances. Only one large walled-off section remains intact and this may conceal the entrances to several caves. Of the accessible caves at least six are between 40ft. and 60ft. in length.

Nearly all the natural caves in the Pegwell area are formed by marine erosion along joints with a predominantly north-west trend.

Surveys BCRA Grade 5d. The lengths of the caves which have been surveyed in the area are:-

1. 40ft. 2. 54ft. 3. 47ft. 4. 50ft. 5. 95ft. 6. 47ft. 7. 32ft.

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Minnis Bay to Westgate, Kent – sea caves

In recent years the strengthening of the sea defences around the holiday resorts has taken its toll on what was once some of the finest scenery on the English coast.

Worst affected are the Minnis Bay and Westgate areas, which once exhibited many fine examples of caves, blowholes, stacks and natural arches in every stage of formation. Most of the destruction took place in the late '50s when large areas were encased in concrete to prevent further inroads by the sea; the stacks were blasted out of existence, headlands were lopped off, and the caves were filled in, deliberately collapsed or walled up.

All that remains today is a few caves near Epple Bay at Birchington; elsewhere it is just a featureless concrete promenade.

A sketch map drawn by R.H.A. Staniforth in the late '50s shows that there were originally more than 60 caves and 5 isolated stacks in the two and a half mile stretch of coast between Minnis Bay and Margate.

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Epple Bay area see illustration

Access There are steps to the beach from the roadside at Epple Bay TR 308698. The caves are inaccessible at high tide, but otherwise unrestricted.

Description The finest of the remaining North Foreland caves are in the cliff just around the eastern end of the Bay at TR 309700. The first is a picturesque cavern, 28ft. long and up to 16 ft. wide, with red and green weed growing on the walls. The wave-cut channel in the floor is usually filled with a spongy mass of washed up seaweed.

A little further to the east is a second cave - a large rift over 30 ft. high at the entrance, penetrating a slightly inclined joint for 75ft. The passage is mostly about 7ft. wide with beautifully clean and scallop-marked chalk surfaces.

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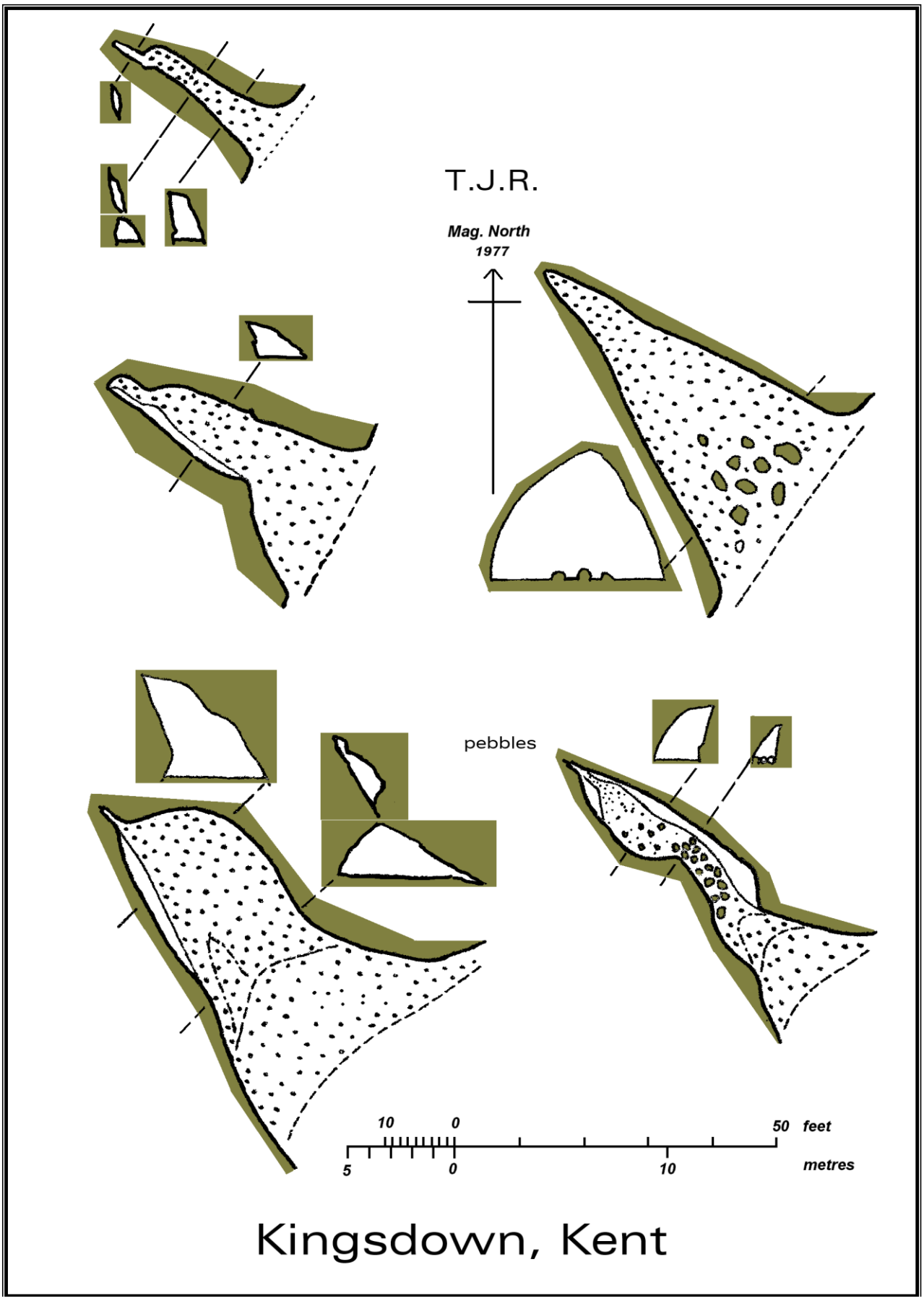
Birchington see illustration

Access There is a pathway to the beach at TR 303698 or an approach from the west side of Epple bay.

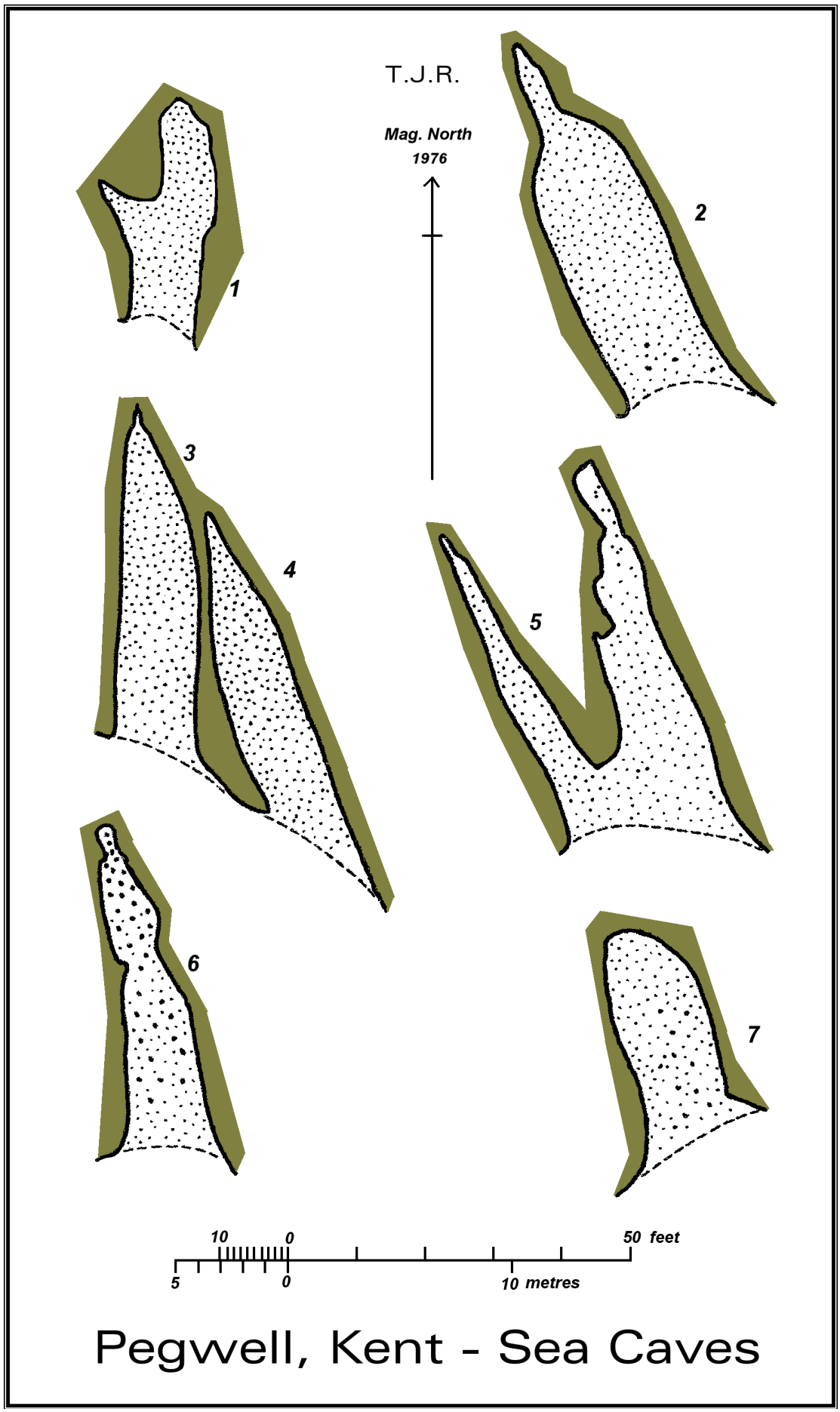
Description

TR 305698 A sea cave, 58ft. long, which has collapsed at the end, forming a blowhole. Adjacent to this is an inlet, probably resulting from the total collapse of another cave.

TR 304698 A sea cave 38ft. long. There is an opening at the rear into a man-made chamber with a steep passage ascending to the surface, thus providing the perfect "Smugglers' Cave".



Kingsdown, Kent



Pegwell, Kent - Sea Caves

A more plausible explanation for the excavation is that it was made for some military purpose.

The top entrance to the cave is a wooden, locked door at the bottom of a flight of steps in a private garden backing onto the cliffs.

There are also a few caves still in the initial stages of formation (maximum length about 25ft.) in the area around the access path - TR 303698. A collapsed cave was probably utilised in the construction of the path.

Surveys B.C.R.A. Grade 5d.

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St. Margaret's Bay, Kent - sea caves

There are two caves near to Ness Point by the southern end of the Bay, neither of which has been surveyed.

The first is in a boulder-strewn rift, about 25ft. long, in the corner of the Bay at TR 367443. The second is a roomy cave, some 40 ft. long and 15ft. wide situated just beyond the tip of Ness Point at TR 368443. Large numbers of creatures resembling wood lice, but nearly one and a half inches long and almost white, were seen clinging to the walls of this cave.

In the cliffs behind the sea wall in the Bay there are a number of small tunnels excavated for some military purpose. There is also a bricked-up opening known as Bay Cave at the southern end of the sea wall, which was noted by R.H.A. Staniforth.

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Kingsgate, Kent see illustration

Castle Caves TR 397705. Two small caves near to the Kingsgate Castle Hotel.

Tower Cave TR 396708. Length 100ft. (1965). The entrance lies directly beneath the ruin of a Napoleonic Tower on the cliff top behind the Captain Digby Hotel. Considerable breakdown has occurred in the formation of this cave resulting in piles of rubble and boulders on the floor, which are gradually being eroded by the sea.

The "boulder pot" shown on R.H.A. Staniforth's sketch has disappeared. He gives the length as 90 ft. in the late '50s.

Crack Cave TR 395709. Staniforth first noticed the entrance to this cave, which had been buried beneath sand and shingle, while walking his dog in 1959.

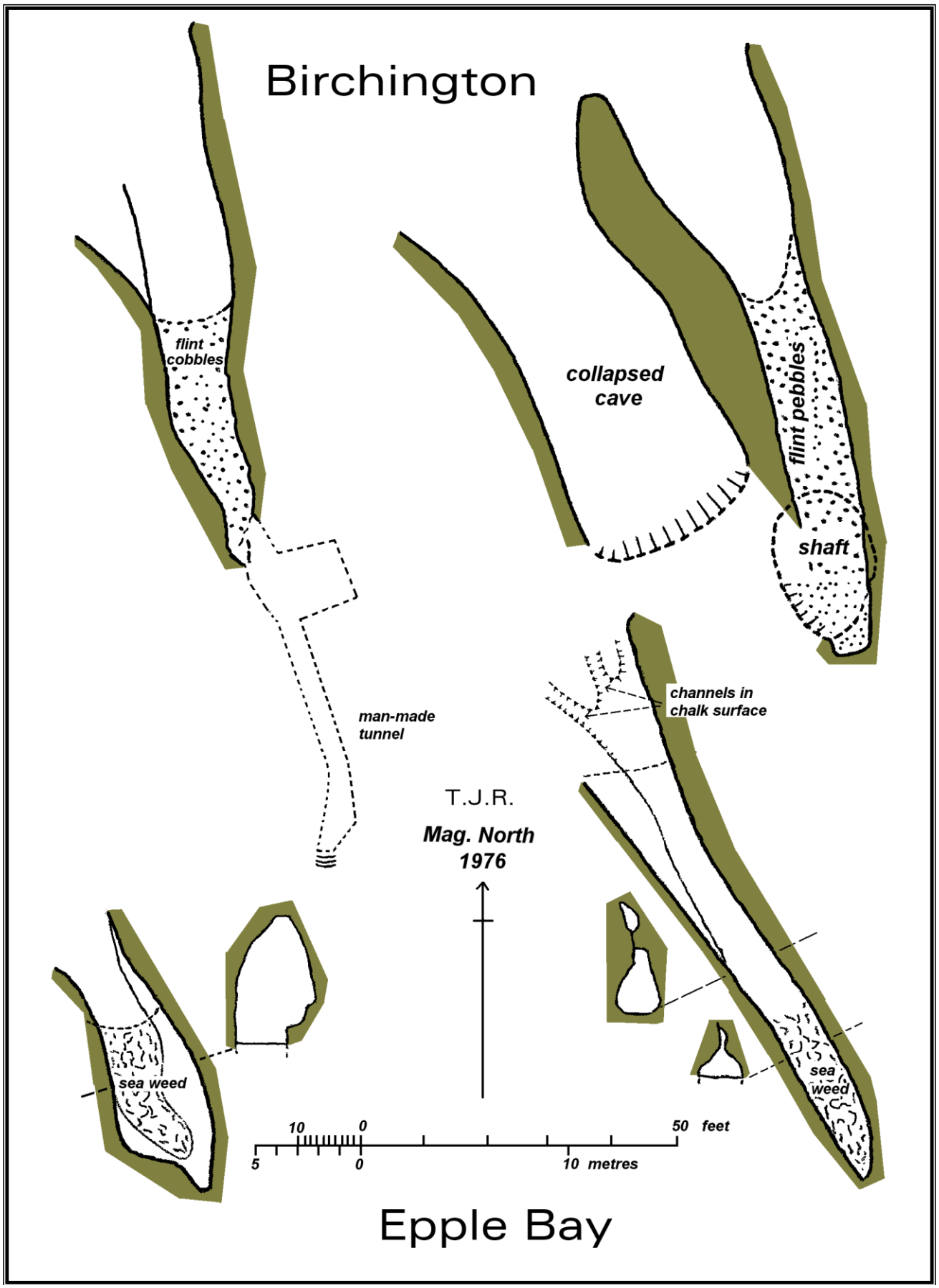
The cave is formed at a joint/bedding plane intersection and consists of a low chamber 25 ft. long and up to 11ft. wide. The height varies with the level of sand and shingle to a maximum of 4ft. at times when the chalk floor is exposed. The dimensions and description have remained constant since the original discovery.

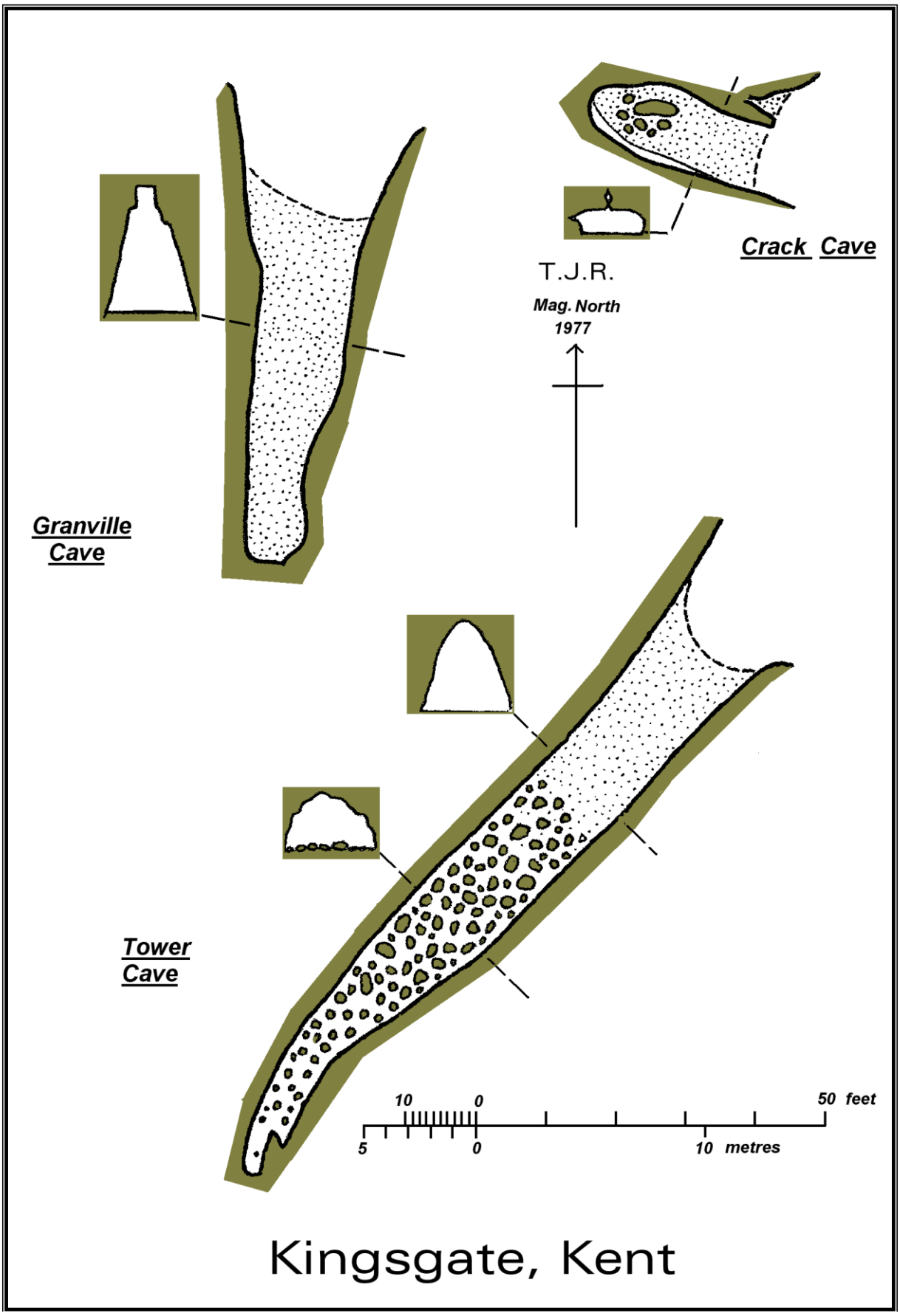
Cliff Cave TR 395709. Staniforth's sketch shows a large, shallow opening about 15ft. above the beach. It has now collapsed completely, leaving a gash in the cliff face which connects with Whiteness Gap.

Whiteness Cave TR 396710. In Whiteness Point, which is marked on the O.S. map. The natural sea cave is 68ft. long but an additional 171ft. of man-made tunnels have been added.

From a partly bricked-up opening in Whiteness Gap, a man-made tunnel penetrates the Point, ending in a "lookout" 15ft. above the beach. A second passage branches to the right to end in a similar manner. Just beyond the junction, a hole in the floor of the main passage connects with a natural sea cave running beneath.

Staniforth's plan of the Ness shows the tunnels but not the sea cave. It is not impossible for the cave to have formed in such a short space of time, as the rate of erosion is several feet per year.


Birchington
flint cobbles
collapsed cave
flint pebbles
shaft
man-made tunnel
channels in chalk surface
T.J.R.
Mag. North
1976
sea weed
sea weed
10 0 50 feet
5 0 10 metres
Epple Bay


Crack Cave
T.J.R.
Mag. North
1977
Granville
Cave
Tower
Cave
10 0 50 feet
5 0 10 metres
Kingsgate, Kent

The entrance in Whiteness Gap is unaffected by normal tides and provides an unusual opportunity to see an active sea cave - a very impressive sight during rough seas.

Whiteness Gap TR 395709. The site of what is probably a large, collapsed cave has been utilised to provide access to the beach.

Granville Cave TR395710. Length 50ft. A roomy passage with a smooth, sandy beach.

Botany Bay Cave (also known as Five Sisters Cave). TR 393710. An opening 10ft. up in the corner of the Bay gives access to a steeply ascending passage with four openings to the cliff face at various levels. The original exit to the surface has been bricked up and filled in. The passage appears to be entirely man-made. The length, according to Staniforth, is 168ft.

Arches In addition to the caves there are two isolated stacks at Fayreness Point. TR 392711. One of these is a recent formation resulting from the collapse of a natural arch which is featured on the cover of "*The Wealden District Regional Geology*". The arch was still in existence at about 1958. During the winter of 1977/78 a new arch was formed near the bottom of Whiteness Gap.

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Isle of Wight see illustrations

The steeply inclined and sometimes almost vertical geological strata on this island includes up to 1,630ft. of chalk, the greatest known thickness for this formation in the British Isles. The main chalk outcrops form a ridge of characteristic Downland running the length of the island and terminating in spectacular cliffs. In the east it forms the 300ft. high Culver Cliff, which provides a fine section of the steeply dipping strata. In the western peninsula chalk is exposed in the cliffs around Tennyson Down, which rises to over 400ft. in places. It also forms the island's most prominent landmarks, three jagged stacks, about 60 ft. to 70 ft. high, known as The Needles.

The boat trips round The Needles, which operate from Alum Bay during the summer, provide an opportunity to view a number of interesting features which are otherwise inaccessible.

Directly below the coastguard station, near the western end of Alum Bay, are the entrances to two large sea caverns, which could possibly be entered by wading and swimming during low spring tides. The Grand Arch is the name given to an enormous recess which undercuts the south-eastern corner of Scratchell's Bay.

The entrance to Needles Cave at SZ 298846 is an obvious opening near the south-east point of the Bay and, according to the dotted outline on the 6" map, extends for over 200ft.

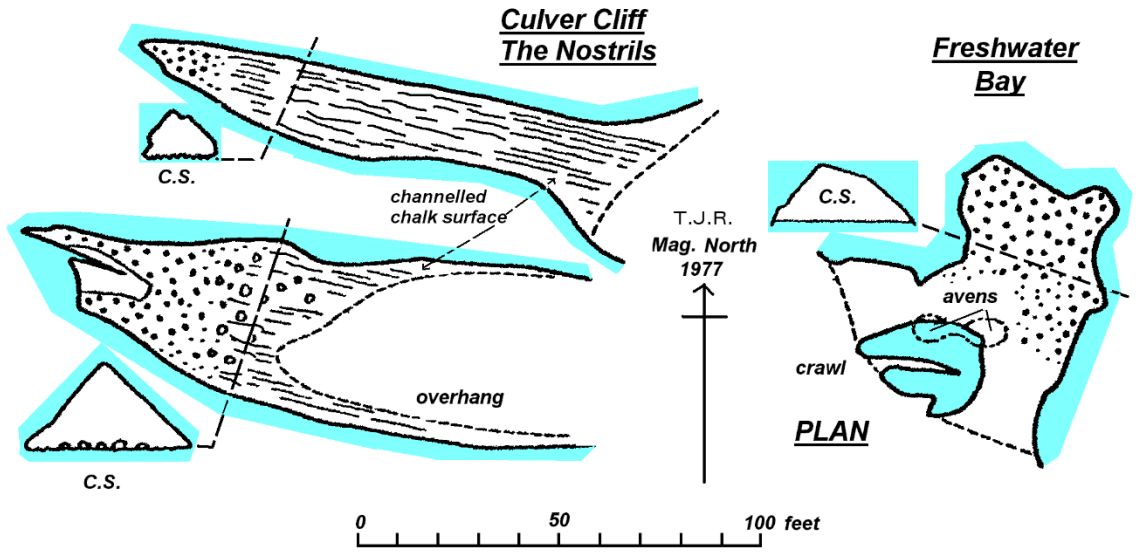
Further east at Highdown Cliff the map shows two caves known as Lord Holms Parlour at SZ 313849, and Frenchman's Hole at SZ 316849, both of which could only be reached by boat.

A number of more accessible caves can be found in the much lower cliffs near Freshwater. In Freshwater Bay several caves can be entered easily during low tide. On the east side of the Bay two openings in the cliff lead into a large shingle-floored cavern at SZ 350855, with curious dome-shaped avens in the roof. These are probably isolated phreatic solution cavities pre-dating the formation of the sea caves. Nearby there are three isolated stacks - Stag Rock, Arched Rock (named for its shape) and the recently formed Mermaid Rock; all about 30ft. high. Just beyond the Mermaid is the entrance to another large cave that could probably be entered by wading.

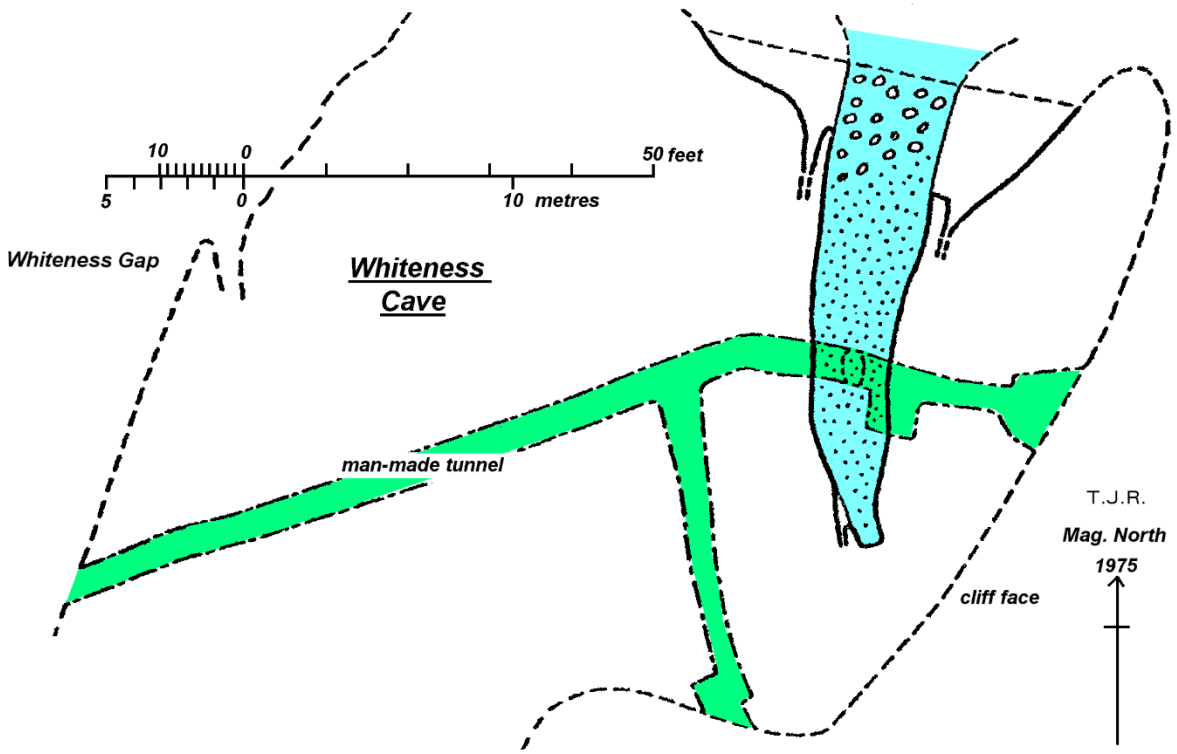
On the western side of the Bay are two promontories jutting out from the cliff and five caves close together at SZ 855853. (See survey to B.C.R.A. grade 5d). Included in this group is Freshwater Cave, a rather smelly passage 68ft. long, floored with a mixture of shingle, driftwood, rotting seaweed, dead sea birds and oil!

A few hundred yards to the west is Watcomb Bay with a small beach enclosed by nearly vertical cliffs some 50ft. to 60ft. high. It is possible to climb down to this beach at one point, or alternatively it can be approached at sea level from Freshwater Bay for only a short period between tides. There is also a tunnel leading to the beach from a blockhouse in Fort Redoubt, but the top entrance to this is boarded up.

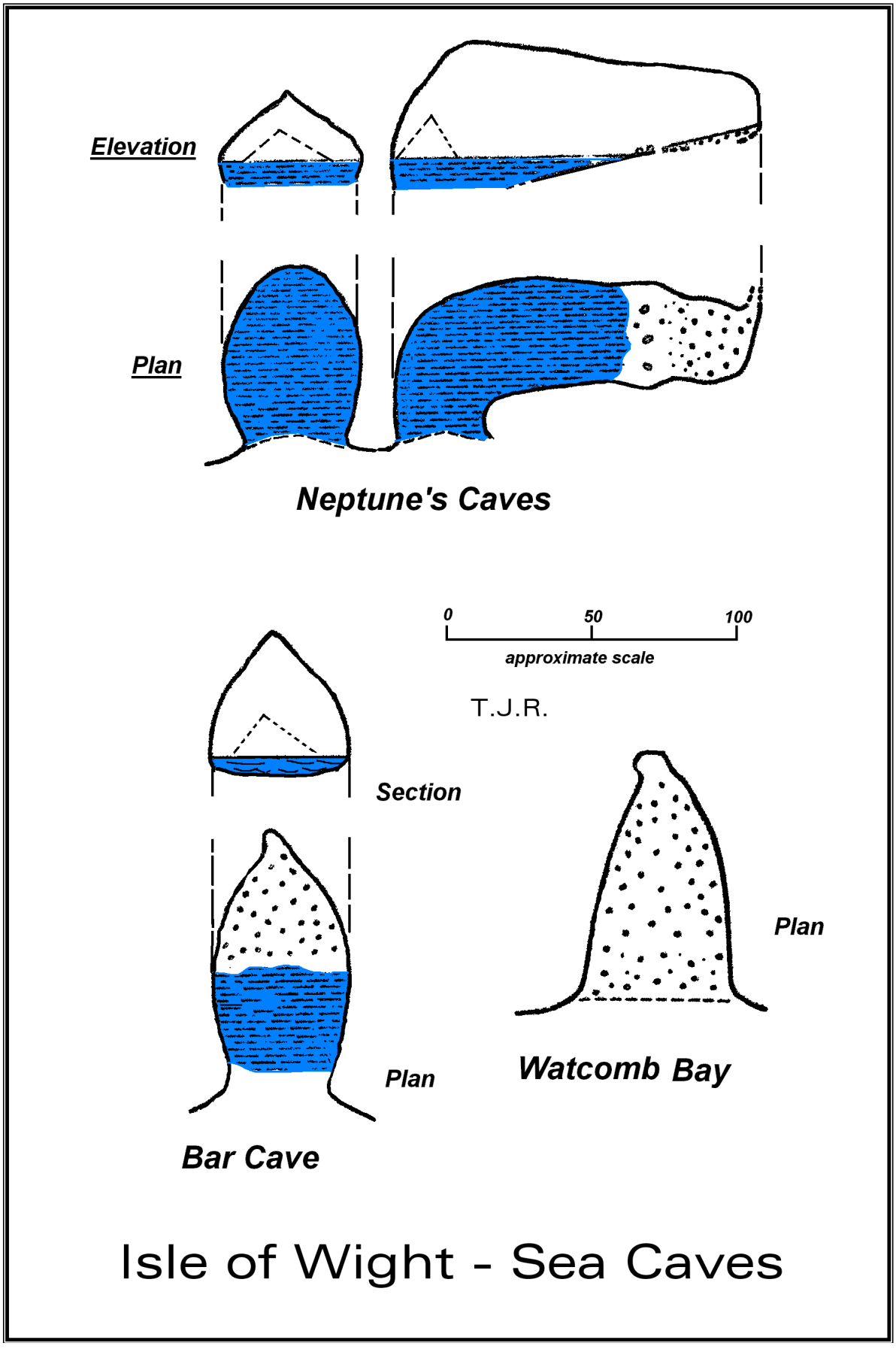
Both ends of the Bay are honeycombed with picturesque caverns with rock pools and large populations of beautiful red sea anemones.

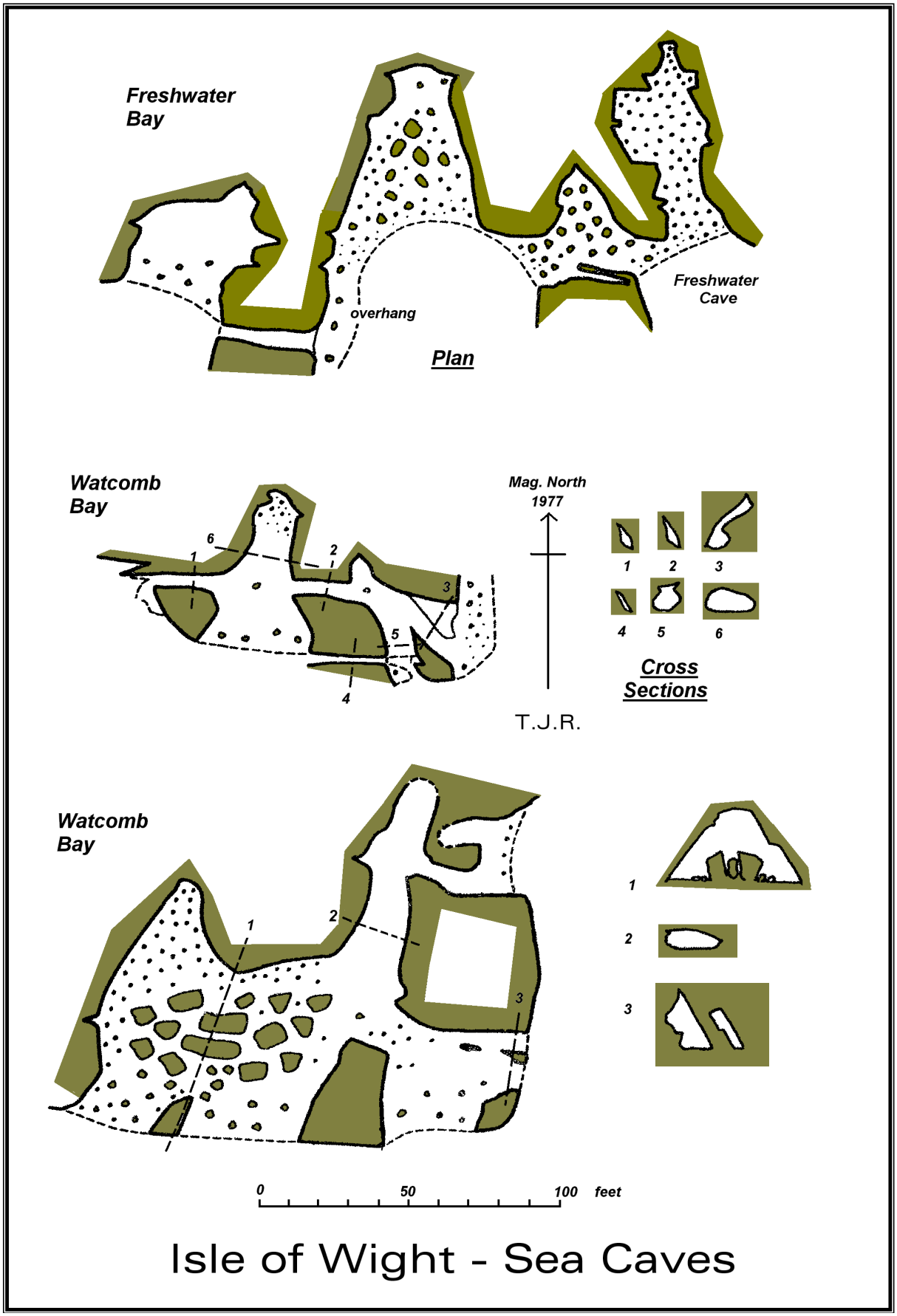


Isle of Wight - Sea Caves

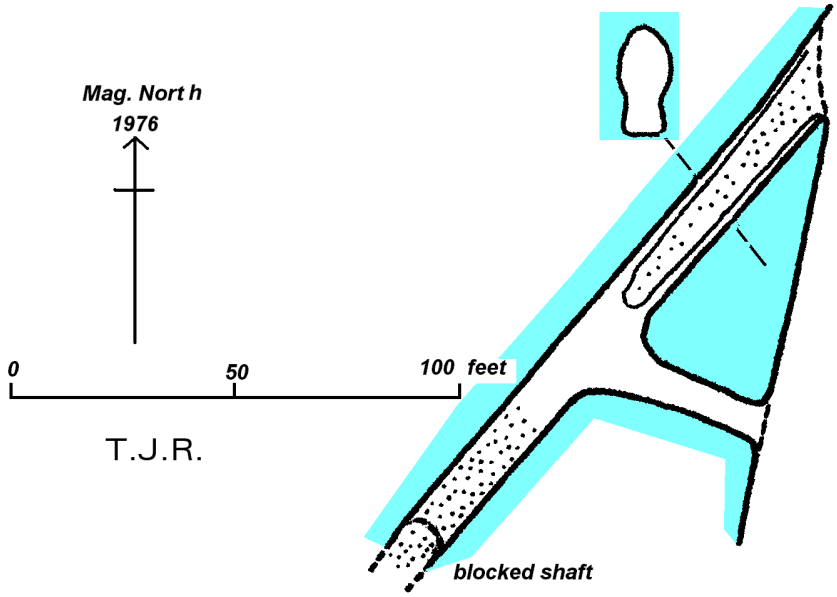


Kingsgate

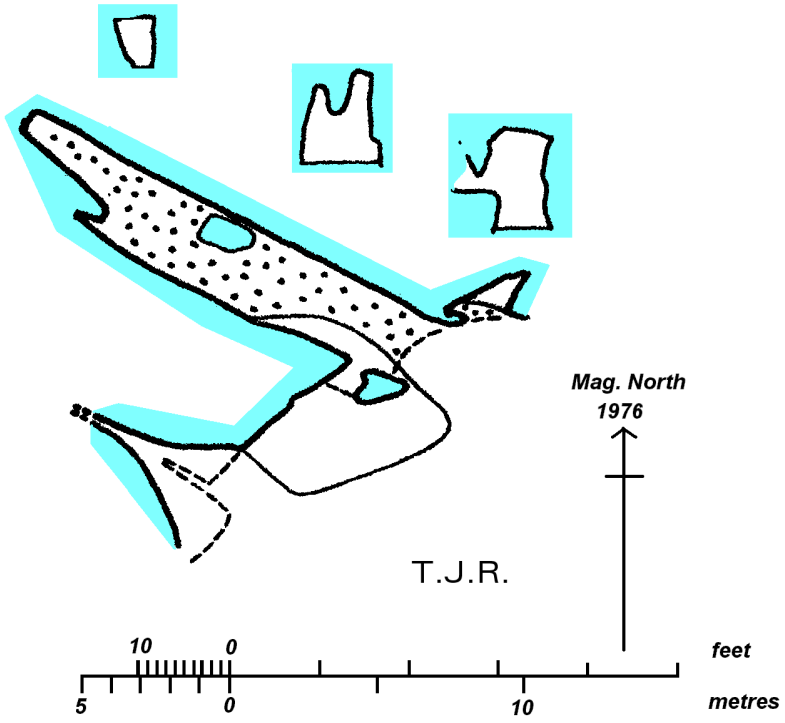

Elevation
Plan
Neptune's Caves
0
50
100
approximate scale
T.J.R.
Section
Plan
Bar Cave
Plan
Watcomb Bay
Isle of Wight - Sea Caves



Isle of Wight - Sea Caves



Kingsgate



Dover

These caverns are the result of marine erosion along east-west bedding planes and north-south joints, combining to produce quite extensive cave systems. Tabular flint seams in the steeply inclined bedding planes seem to have played a major part in the formation of east-west passages parallel to the cliff.

The eastern system in this Bay at SZ 342845 has passages totalling 180ft. in length (See survey to B.C.R.A. Grade 5d). The larger cave under the south-west corner of the bay at SZ 342854 consists of roomy passages and huge, interconnecting chambers totalling 380ft. (See survey to B.C.R.A. Grade 5d). An even better measure of its size can be given in terms of its floor area, which is 0.18 acres or 891 sq. yds. Particularly impressive is the enormous, boulder-strewn chamber behind the two westernmost entrances, which has a variety of sea-weed or lichen growing all over the walls.

Just beyond this cave system, but completely separate from it, is another large cavern (See sketch to B.C.R.A. 2) about 45ft. wide at the entrance and about 90ft. long, which can sometimes be entered by wading.

Situated 3-400 yds. West of Watcomb Bay are the enormous, permanently active sea caverns known as Neptune's Caves at SZ 339854 and Bar Cave at SZ 338854. Neither has been properly surveyed, but a rough estimate of their impressive size was made by pacing (B.C.R.A. grade 2). The approach is both difficult and dangerous, involving a lot of wading and swimming, and is only possible in calm conditions.

On the other side of the island the Nostrils sea caves at SZ 638854, at the south east point of Culver Cliff, are easily approached at low tide from Whitecliff Bay. Both caves are formed along steeply inclined bedding planes with tabular flint seams. The southernmost cave lies at the end of a large inlet with overhanging sides. The actual cave is 87ft. long and up to 38ft. wide. The adjacent cave is 127ft. long and up to 20ft. wide.

There is also something called Hermit's Hole marked on the 6" O.S. map at SZ 638855, but this has not been located.

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WARNING General guidance on underground exploration has been given in earlier volumes. A current set of tide tables is an additional pre-requisite for sea cave exploration.

Kingsgate, Kent - Smugglers' Cave see illustration

Location TR 396708. The cave extends beneath the garden at the rear of the Captain Digby Hotel.

Access Use the pathway to the beach at Whiteness Gap or the steps at TR 396706. Not accessible at high tides.

Description This appears to be a natural sea cave, extensively modified for military purposes. A roomy passage some 10ft. wide and 30ft. high extends for 150ft. ending in a pile of debris under what appears to be a choked shaft. Another passage branches off to the left to an entrance 15ft. above the beach.

To what extent the cave is natural is uncertain, though it would seem that everything beyond the 65ft. long wave-cut channel in the main entrance has probably been dug.

Survey B.C.R.A. grade 3.

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Dover, Langdon Cliffs see illustration

Location TR 3542. In the cliffs between Dover and St. Margaret's Bay.

Access A steep zigzag path is cut into the cliff face about half a mile north of the clifftop car park at TR 337422 which overlooks the Dover Harbour. This gives access to Langdon Stairs beach. The main group of caves is situated about a third of a mile to the north at a place called Fan Bay.

An alternative approach is the cliff bottom route from the sea front at St. Margaret's Bay. Access is unrestricted but the area is inaccessible at high tide. Notices warn of the necessity to check the times of high water.

Description A number of joints and faults have in places been widened by solution into narrow fissures, usually no more than a few inches wide, and generally filled with loamy sediments. These fissures have in turn led to the formation of sea caves.

The first and southernmost cave appears to be a fairly roomy passage almost filled to the roof with shingle, which gets washed in and out. It can therefore be either a hands-and-knees or flat out crawl for 50ft. to 60ft.

The second cave is a narrow rift, varying from 1ft. to 5ft. wide and extending over 50ft. along a fault before entering an impenetrable fissure.

Following this (see survey) is a roomy sea cave some 50ft. long, formed between two parallel joints. At the time of the survey (1967) there was a small arch opening onto a ledge 4ft. above the beach on the left-hand side of the cave mouth. This has since been eroded away. A post-survey roof fall has also changed the cross section.

The survey also shows a second joint cave, still in the early stages of formation 20ft. to the left of the main cave.

What appears to be the entrance to another rift - the northernmost cave in this group - is blocked with boulders and shingle washed up against the cliff, but it would not be difficult to remove the obstruction.

By standing back from the cliff between the second and third sea caves it is possible to see two openings, one above the other, just below the summit. These are roughly circular and some 3ft. to 4ft. in diameter. They appear to be solutional enlargements of a joint and are often occupied by sea gulls. They have not yet been examined and could possibly be entered by hanging a wire ladder over the edge of the cliff.

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St. Margaret's Bay, Kent - Canterbury Cave see illustration

Location TR 368442. A steep road with hairpin bends descends to the sea front at St. Margaret's Bay. On the south side of the Bay the chalk promontory of Ness Point marks the beginning of South Foreland and, just beyond this point, there is a sea cave. The entrance to Canterbury Cave is about 50yds. south of the sea cave and just above the high water mark.

Access Unrestricted but cut off for long periods of high tide.

Description This interesting cave received a great deal of attention from the C.S.S. during the winter of 1975/76. The only previous written reference to date is the name "Canterbury Cave" on a sketch map of the South Foreland by R.H.A. Staniforth. Apparently this is a local name for the cave.

The cave entrance was also noted by Terry Reeve in 1965, but was not fully explored at the time as the passage went beyond the limit of daylight penetration. Thus it was not until November 1976 that its significance was realised, when it came as something of a surprise to find a cave system of unsuspected length.

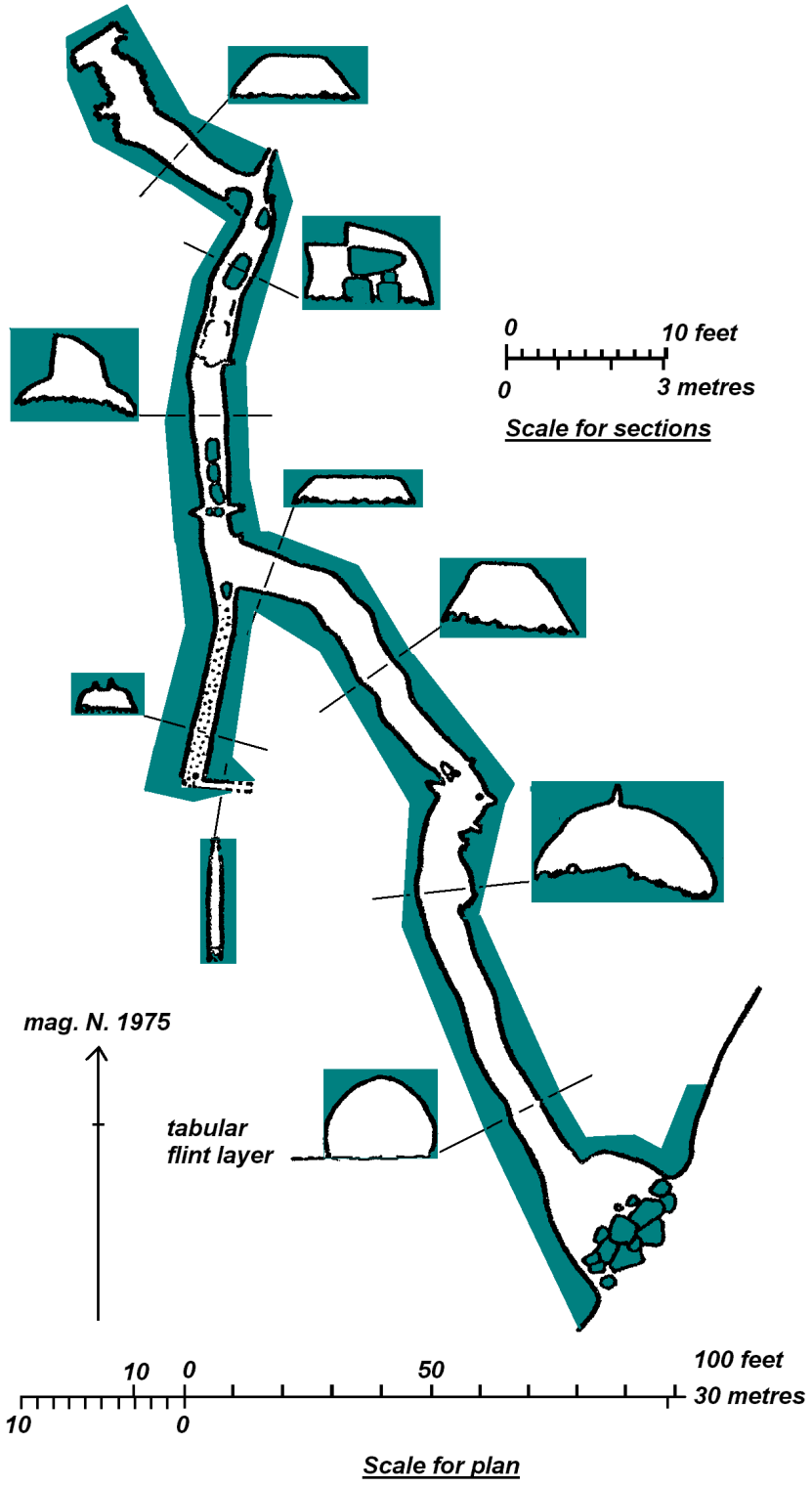
This cave cannot have resulted from sea erosion as it is above the normal range of tides. The formation of the cliff appears to have exposed an existing fossil cave system originally formed from karst drainage, similar to those in Northern France. Just how much cave has been eroded on the seaward side is a matter for conjecture.

It is entered by clambering over various boulders into what appears to be a chamber caused by a roof collapse due to the encroachment of the sea. This was probably at the confluence of two former passages on the seaward side. The remains of these in the form of two additional entrances to the chamber were still detectable in 1965.

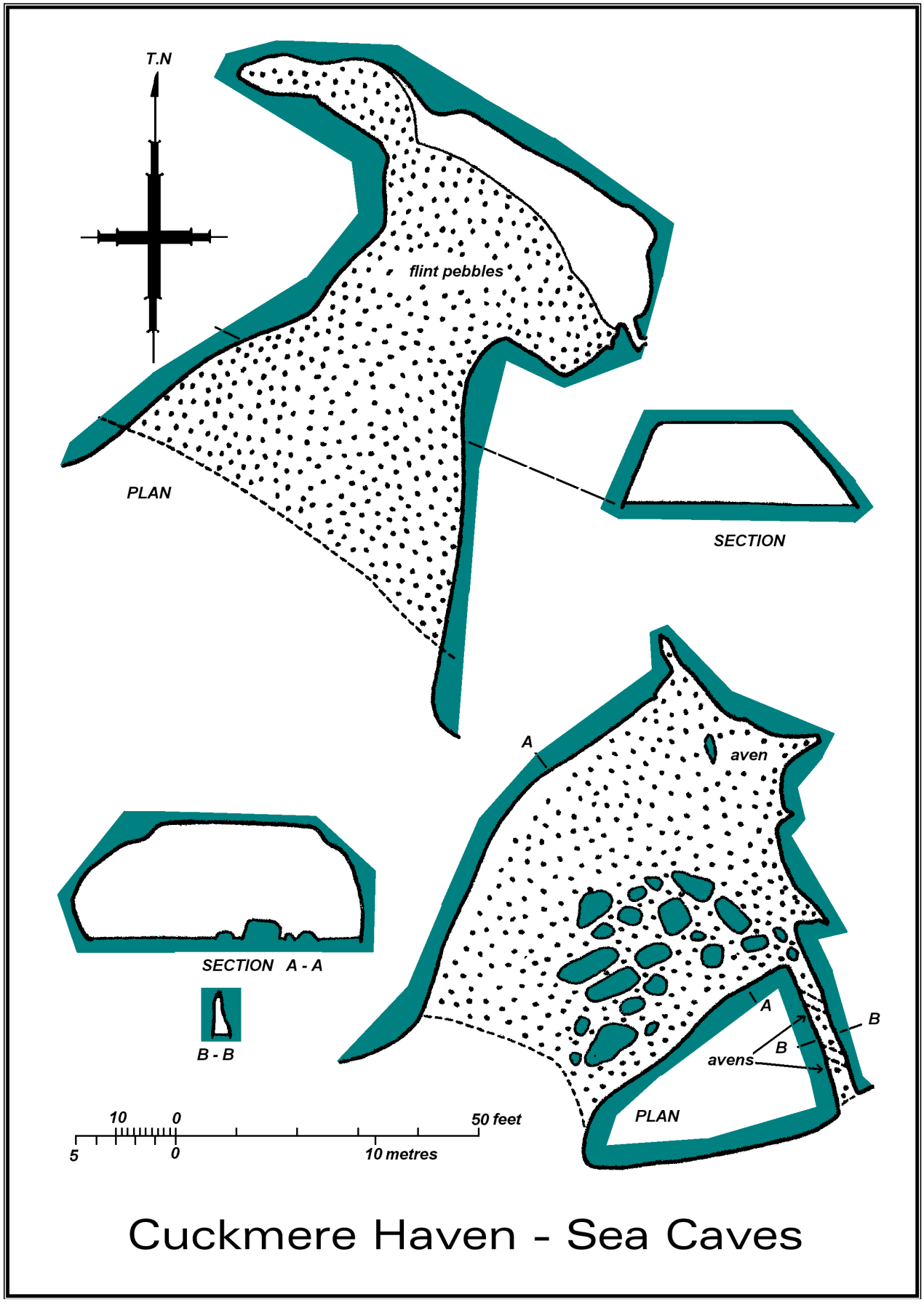
At the rear of this chamber a passage averaging 7ft. in width and 4ft. in height extends into the cliff in a north-west direction. It is floored with a collection of flint nodules and solutionally-eroded chalk rubble. Progress is mainly by hands and knees crawling. 80ft. from the cliff face, the passage bends to the right, assuming a northerly direction and opening into a small chamber 30ft. long, up to 12ft. wide and up to 5ft. high, before resuming the north-west direction after a sharp left turn.

Any doubts on the origin of the cave are cast aside on entering this chamber; the roof and walls are covered with scallop markings; flints and fossils protrude from the solution-eroded chalk; joints have even been picked out by the solution. At floor level on the right hand side there are a number of tube-like openings up to 9ins. in diameter.

About 50ft. beyond the chamber, the passage veers to the left and becomes a flat-out crawl for about 20ft. The crawl ends in the form of a T-junction with a roomier north-trending passage. The obvious way on is to the right and, after a few yards in this direction, a dissolved-out joint is seen crossing the passage at right-angles. Beyond this point the passage is strewn with large boulders which have obviously fallen from the roof. Most of these boulders show evidence of solutional erosion and the same can be said of their original locations between two parallel joints in the roof.



Canterbury Cave,
St. Margaret's Bay, Kent



Cuckmere Haven - Sea Caves

So it seems likely that most of this breakdown occurred when the cave was actively filled with water. After you have crawled over and around various boulders for about 70ft. the cave appears to end at an impenetrable fissure, but closer inspection reveals a way on to the left and a short, flat-out crawl leads to another stretch of roomier passage, which terminates choked with rubble and boulders just over 300ft. from the entrance. It is quite possible that the passage continues beyond this choke and there would seem to be some prospect of passing the obstruction by careful digging along the right hand wall.

Returning to the T-junction, the passage continues southwards, but rapidly diminishes in size, and is almost choked to the roof with sediment, apparently derived from the Thanet Sand. The passage was eventually pushed in this direction for about 45ft. by deepening the floor. During the excavation, a number of rat and rabbit bones were unearthed. The roof shows evidence of being heavily eroded, with rounded pockets etched out along the joints. At the furthest point reached, the way ahead was completely choked, but a narrow rift could be seen on the left, with rounded solution pockets in the roof.

The total length of the cave is 350ft. The passages are obviously joint-oriented, but there is another less obvious feature that may have played a major part in the formation of the cave, and that is the tabular flint layer seen beneath the rubble floor near the entrance. In the cliff face nearby, the chalk above the upper surface of the same flint layer is honeycombed with tubes a few inches in width in the form of a network - in effect a micro-cave system. It is also interesting to compare the cross-sections with those of a cave found under Strood Waterworks, which show a tabular flint layer at floor level. Further examples of cave floored with tabular flint can be seen in a cliff near Beachy Head.

Survey The cave was surveyed during two visits during 1976 by T. Reeve, Dave Parkyn and Phil Dinn. A fibron tape measure was used and bearings taken with a prismatic compass. Offsets from the survey line were taken at intervals of 5ft. The survey meets the requirements of B.C.R.A. 5d.

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Dover, Kent - Shakespeare Cliff

Location TR 3039.

Access A footbridge over the railway gives access to the base of the cliff at low tide.

Description Numerous shallow sea caves are formed in the massive, grey Lower Chalk.

Cuckmere Haven, Sussex - sea caves see illustration

Location TV 5396. In the Seven Sisters Cliffs about half a mile from the mouth of the River Cuckmere.

Access The cliff is best approached through the Seven Sisters Country Park from the car park at the side of the A259. The caves are inaccessible at high tide.

Description Two sea caverns of very impressive dimensions make nonsense of the widely held belief that chalk is too unstable for cave formation.

The first cave (at the bottom of the illustration) has an entrance 32ft. wide and over 25ft. high opening into a cavern 67ft. in length and up to 50ft. wide. Two smaller passages, formed along a joint which crosses the chamber, branch off from opposite corners at the rear. The left hand passage closes down after a few feet; the right hand passage is 25ft. long with two vertical avens in the roof, and it connects with the cliff face. There is also a small aven formed on the same joint in the roof of the main chamber. The cave is floored with chalk boulders and large flint cobbles. The total length, including the side passages, is 98ft.

The second cave is 130ft. in length with a roughly T-shaped plan. A 63ft. wide entrance narrows to an opening 25ft. wide and 11ft. high at 50ft. beyond which it opens into spacious caverns formed along a joint running parallel to the cliff. The cave contains a beach of eroded flint cobbles and pebbles.

Surveys The large chambers were surveyed by closed traverses around their perimeters, with offsets measured from the traverse line. The small passages were measured by offsets from the centre line. B.C.R.A. 5d.

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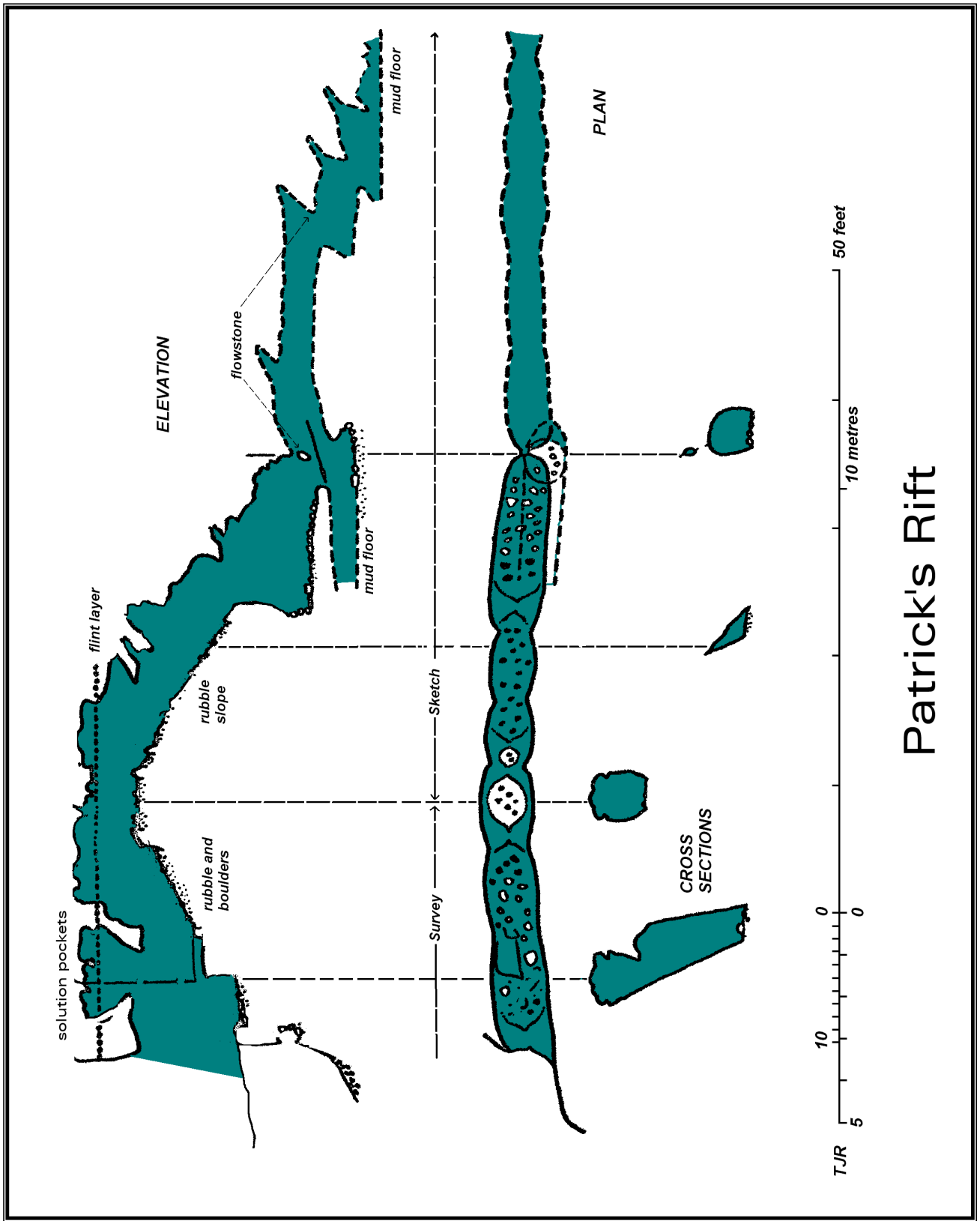
Beachy Head, Sussex

Location TV 5695. The two mile stretch of cliff between Birling Gap and Beachy Head Lighthouse.

Access It is possible to descend the cliff about half a mile to the east of the lighthouse. Access to the beach at Birling Gap is provided by temporary steps during the summer months. In winter there is usually a rickety wooden ladder with a notice warning you that you use it at your own risk.


Patrick's Rift
ELEVATION
PLAN
CROSS SECTIONS
Survey
Sketch
TJR
solution pockets
flint layer
rubble and boulders
rubble slope
flowstone
mud floor
mud floor
0
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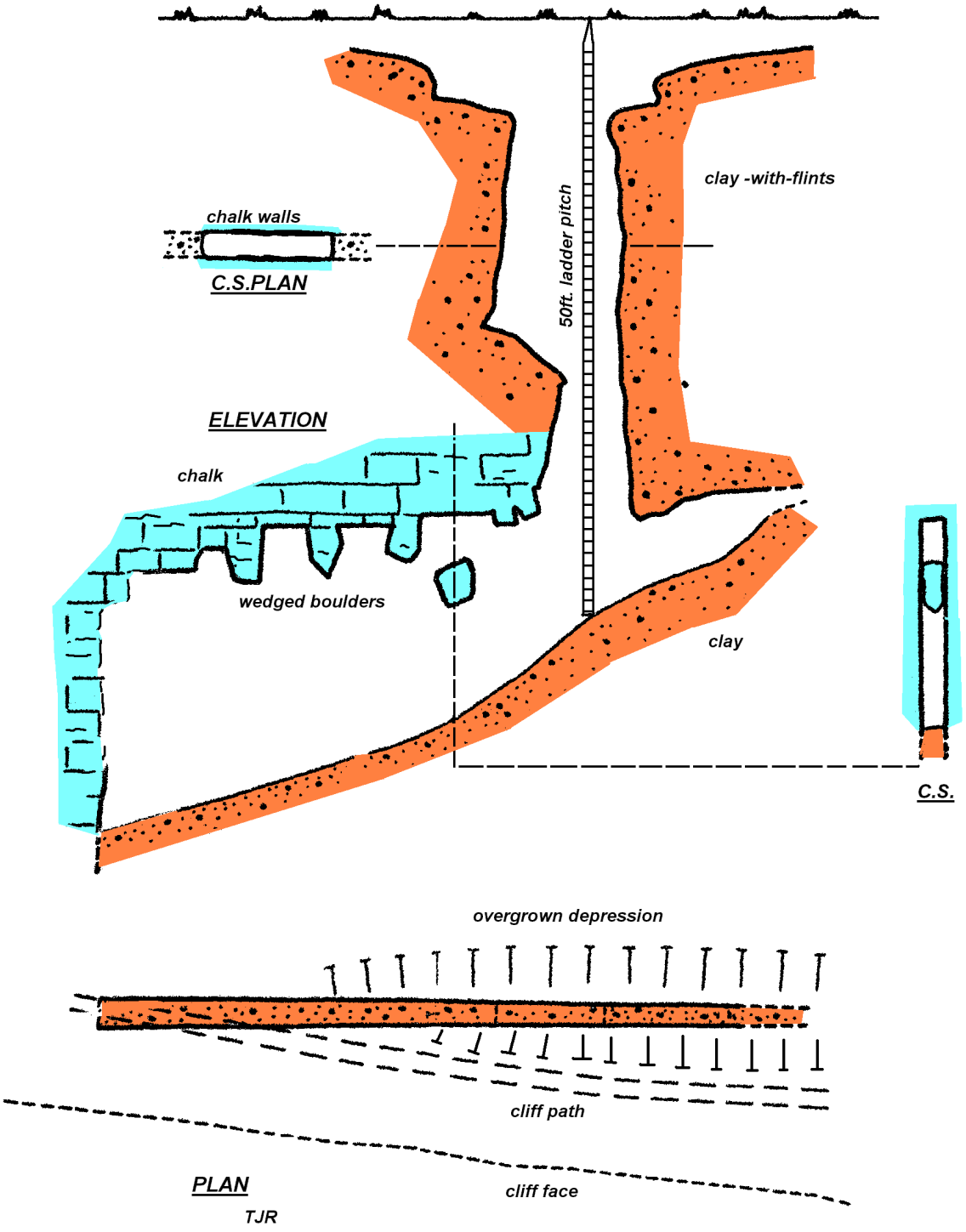
10 metres
50 feet



Beachy Head - Fissure

Any visit must be carefully planned according to the state of the tide. The importance of checking the times of high tide cannot be over-emphasised: there is no escape if you are cut off.

Descriptions An examination of the cliff section by "Unit 2 Cave Research and Exploration" and by the author has revealed numerous cavities, nearly all of which appear to be fossil karst features rather than sea caves. Many of these are inaccessible (and likely to remain that way!) at varying heights in the cliff up to 400ft. a.s.l. Some are open cavities, while others are infilled with clay, sand or chalk rubble.

Fortunately there are a number of cavities at or near the bottom of the cliff which either have or could be explored without too much difficulty.

Going from west to east the following sites can be inspected:-

1. Several small rifts, one above the other on the same joint. The true extent of the cavity was not realised until the Spring of 1978, when it was found that the sea had removed shingle from the lowest opening revealing a narrow rift passage along which it was possible to edge sideways for about 40ft.

2. A vertical shaft (probably the remains of an ancient well) sectioned in the cliff.

3. Small, phreatic cavity, about 2ft. high and 2ft. wide, some 12ft. above the beach. It was reached by an awkward climb but found to extend only a few yards.

4. **Patrick's Rift** see illustration

It is named after the member of Unit 2 who recorded the first entry in 1976. The entrance is an opening 6ft. up in the cliff face. Originally it was found to be blocked 10ft. from the entrance, but subsequent removal of boulders gave access to about 80ft. of passage formed along a joint inclined about 15° from the vertical.

At the far end the passage could be seen to continue, but was nearly filled to the roof with mud, and further progress could now only be achieved with difficulty. It would involve digging in a very confined space with nowhere to dump the spoil.

On one occasion several Unit 2 members stayed in the cave during high tide and found it to be high and dry, apart from spray caused by waves banging up against the bottom of the cliff.

The entrance zone is often occupied by pigeons, which use it as a nesting place and, when disturbed, can give the unsuspecting caver quite a surprise.

The cave exhibits a number of interesting formations; particularly impressive are the superb rounded pockets etched out along the joint in the roof. These were obviously formed under phreatic conditions. Another interesting feature is the existence of calcite formations in the form of hard, orange flowstone down the wall in some places, and stalagmited boulders. There are also a few mud formations.

When the cave was revisited in 1978 it was found to have been shortened by about 6ft. at the entrance following a cliff fall.

5. A low opening at the foot of the cliff opens into a lofty rift passage about 20ft. long. This is probably a karst feature enlarged by sea erosion.

6. Directly above no.5, about 40ft. up on the same joint, there is another opening which is undoubtedly a karst feature. The opening, about 10ft. high and 5ft. wide, is partly filled with chalk rubble, leaving a 4ft. high gap at the top. Dome-shaped pockets, like those in Patrick's Rift, can be seen in the roof.

It is virtually impossible to climb up to the cave, but it could be entered with the help of an extending ladder or scaling pole.

7. Barney's Burrow - was opened up by Unit 2 in the 1970's. It was cleared of debris such as seaweed and driftwood for about 30ft. beyond which it could be seen to continue in the form of a 4ft. diameter phreatic tube, almost filled to the roof with rubble and boulders.

8. An 8ft. high 3ft. wide opening 40ft. up in the cliff, infilled with chalk rubble to within 2ft. of the roof. The cavity could only be entered by using a ladder or scaling pole.

9. A small cave about 20ft. long in the right hand side of an overhang at the foot of the cliff.

10. An overhung recess with a vertical aven in the roof.

11. A small cavity 2ft. 6ins. high and wide filled with loamy sediment and chalk blocks to within 8ins. of the roof.

12. At first sight this looked like a typical joint-controlled sea cave, closing down after about 30ft.; but on closer inspection it could be seen to open out again beyond a restriction.

In 1978, after the sea had washed away the shingle on the cave floor, it was just possible to squeeze through the restriction into a small chamber with two vertical "chimneys" in the roof. The first was climbable to a height of about 25ft., where it ended in a choke: the second was 15ft. high to a choke.

13. About 50 ft. to the right of no.12 there is a 2ft. high and 2ft. wide opening above a tabular flint layer 12 ft. above the beach. This can be reached by standing on someone's shoulders, but becomes blocked with rubble after a few yards.

14. A 5ft. wide, 3ft. high opening on an inaccessible ledge paved with tabular flint, about 15ft. above the beach. The ledge could probably be reached with the aid of a few pitons or by cutting handholds in the cliff.

15. A small phreatic tube chocked with rubble after a few yards. The opening is about 2ft. wide and 2ft. high and is formed above the same tabular flint band as no.14. The cliff face beneath the cavity is an easily climbed slope.

16. A shallow joint cave with vertical rifts above.

In addition to the specific sites mentioned there are many more inaccessible cavities at various heights in the cliff faces, particularly within an area of about half a mile west of the lighthouse.

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Beachy Head Fissure, Sussex see illustration

Location NGR TV 584952. Near the summit of the famous 530ft. high cliffs, east of the lighthouse.

Access The area is now fenced off.

Description The cave was examined by the C.S.S. in 1976. The entrance is a vertical rift opening in an elongated depression running alongside the cliff path. A 50ft. metal caving ladder belayed to a metal pipe hammered into the ground was used for the descent. At the foot of this pitch was a steep clay slope descending a rift passage with large boulders wedged between the walls.

This passage extended for about 50ft. to the west of the entrance pitch, ending abruptly in a blank wall at what is probably a joint intersection. At the other end the passage is choked with clay after a few yards. The lower end of the clay slope is some 65ft. to 70ft. beneath the surface.

Shortly after the C.S.S. visit the fissure made headlines in the local Press following an accident involving a 14 year old local girl who fell 50ft. (90ft. according to the paper) down the open shaft. Fortunately her cries for help were heard and she was rescued by the coastguards having suffered only cuts and bruises. The area was then fenced off.

The cave is clearly a tectonic feature formed by the two sides of a fault or joint moving apart, not unlike the Portland fissures in Dorset, the Ightham fissures in Kent, and the "Windypits" of North Yorkshire.

Survey B.C.R.A. grade 2. Entrance pitch measured.

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Newhaven, Sussex see illustration

Location TV 4399. The caves are situated in the cliffs midway between Peacehaven and Newhaven.

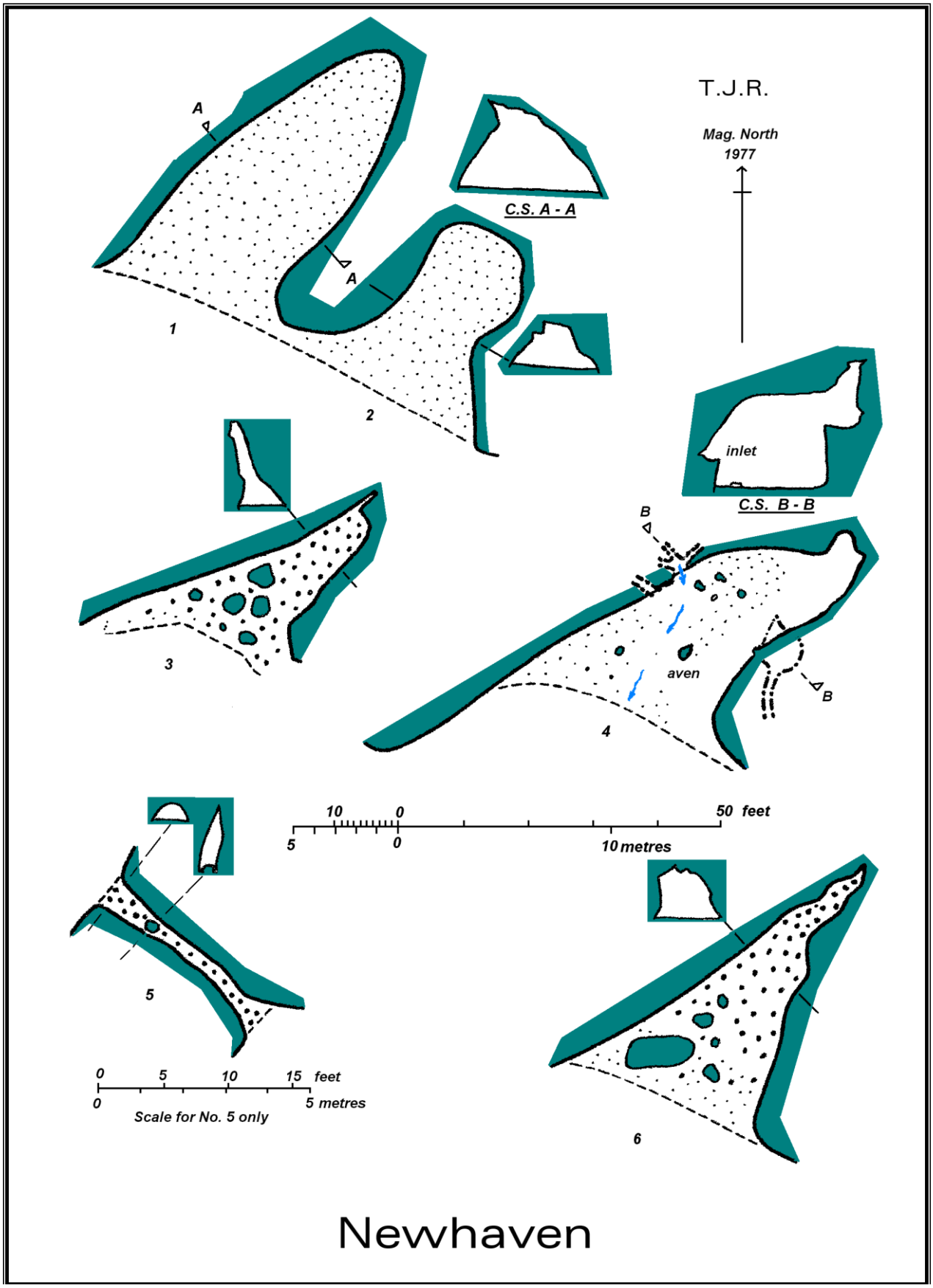
Access The base of the cliff is accessible at low tide from the steps to the new Promenade at Peacehaven or the N.C.P. car park near Newhaven Harbour.

Descriptions

Nos 1 and 2. Roomy caverns formed by marine erosion. Their development is strongly influenced by seams of tabular flint occupying joints in the chalk. Both caves have smooth, sandy beaches. The larger of the two is 49ft. in length and 26ft. at its widest part.

No.3. A small, joint-controlled cave penetrating 33ft. The promontory to the left of this is breached by a curious opening about 5ft. high and 5ft. wide; possibly a remnant of a fossil cave passage originally formed by karst drainage.

No.4. A tight crawl, 16ft. in length, passing through a spur in the cliff and probably formed by marine erosion along a joint from both directions.


T.J.R.
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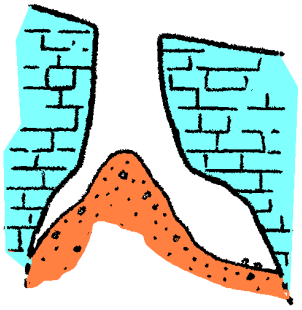
Newhaven



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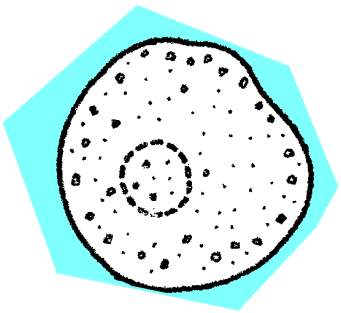

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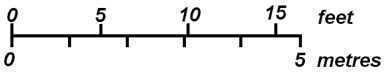

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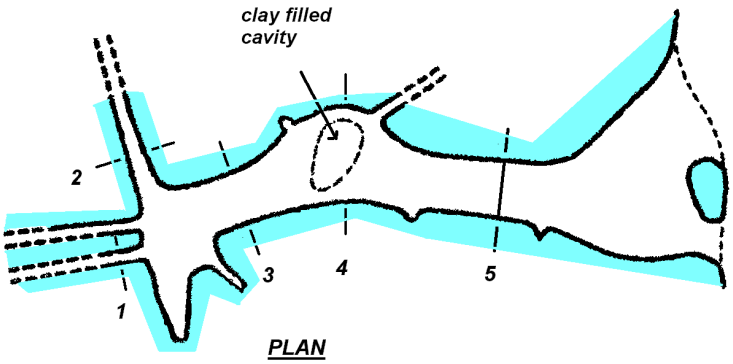
Box Hill, Surrey



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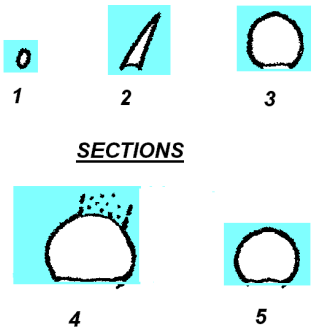

SECTIONS

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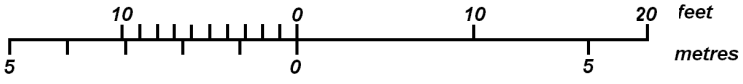

Folkstone Warren, Kent

No. 5. This is an interesting combination of a marine and freshwater cave development, where a sea cavern has encroached upon previously existing karst cavities. In wet weather a stream of crystal clear water, entering the caves via tubes and fissures in the left-hand wall, cascades 3ft. onto the cave floor and flows out of the cave, down the beach and into the sea.

On the right hand side of the cave is a shallow recess 10ft. above the floor, which can be entered by standing on someone's shoulders, or by piling up chalk blocks underneath. A small passage branches off to the right and is 11ins. wide and 18ins. to 2ft. high, along which it is possible to crawl sideways for a few yards before it becomes partly blocked with gravel.

The passage is obviously a fossil stream channel and exhibits the classic cross-section of a "vadose canyon", formed by a stream cutting a trench beneath a network of tubes in the bedding plane roof. The passage almost certainly connects with an opening of similar cross-section about 12ft. up in the cliff to the east of the sea cave. Another inaccessible opening, about 11ft. up from the floor in the left hand wall of the sea cave also appears to be a continuation of the same fossil streamway.

No.6. This is a roomy joint cave penetrating 47ft. It is 30ft. wide at the entrance tapering towards the end with a slightly wavy outline.

Further east near Newhaven Fort there are numerous solution cavities formed in bedding planes and joints, but these rarely achieve man-sized proportions and are invariably choked with sediments derived from the Tertiaries overlying the chalk.

The cliffs at Newhaven Fort are reputed to be honeycombed with tunnels dug in Napoleonic times, but these have not yet been examined by the C.S.S.

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Peacehaven, Sussex

At TQ 4200. There are some half a dozen sea caves formed at joint/bedding plane intersections in the cliffs to the west of the new promenade. Maximum length about 35ft.

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Rottingdean, Sussex

At TQ 3702. A few embryo sea caves, maximum length 20ft. to the west of the promenade.

Box Hill, Surrey - collapse see illustration

Location TQ 174513. In the middle of the footpath ascending Box Hill cliff about 60ft. from the northern bank of the River Mole, near the metal footbridge.

Access The cavity is in a National Trust area. Permission has not so far been forthcoming from the local committee of the Trust to attempt any exploratory digging.

Description A collapse, which occurred during the winter of 1976/77 following a severe drought the previous summer. The collapse is convincing evidence of an elusive cave system formed by underground drainage from the River Mole swallets. Another collapse on the river bank a few yards from the footbridge is reputed to have given temporary access to some sort of cave system in 1975. Unfortunately there are no details of this intriguing find, which was examined by members of the Unit 2 Caving Group.

The latest collapse was examined by members of the C.S.S., who found it to be about 3ft. in diameter at the top, increasing to over 10ft. at the bottom, with a depth of about 12ft. The crumbly walls are typical of the frost shattered zone which occurs in chalk close to the surface.

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Folkestone, Kent - The Warren see illustration

Location TR 241376. In the cliffs above The Warren Caravan Site at Dover Hill.

Description The Warren is an extensive landslip which is overgrown with vegetation. The cliffs resulting from the subsidence are some distance from the sea.

From the road several natural cavities can be seen in the cliff face beyond the caravan site. These can be reached by a steep path ascending an overgrown scree slope. Near the top and to the left of the path is an oval opening some 3ft. high and 2ft. wide, which closes to an impenetrable fissure after a few feet.

At the top of the slope the path turns right along the foot of an outcrop of massive, nodular chalk. In this face there is a curious overhang - possibly the wall of a cave which has fallen away, and some tubes and fissures up to 9ins wide.

The path eventually leads to a small cave, not visible from the road, which extends for about 40ft., terminating in impenetrable tubes and fissures. The floor of the cave is covered with a layer of chalky dust.

The chalk in which the cavities occur is probably the "Melbourne Rock" at the base of the Middle Chalk.

Survey B.C.R.A. Grade 5d. Distances are measured and angles estimated.

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Folkestone, Kent

Location NGR TQ 225380. In the face of an abandoned quarry on the north side of the A260. An obvious opening, which can be seen from the road.

Description This appears to be an isolated solution feature which has been exposed by quarrying. The opening is about 8ft. wide and 4ft. high, formed in the frost-shattered zone a few feet below the surface. It goes in about15ft. terminating in small, drafting cavities. The roof and walls are covered in a soft, cobweb-like encrustation – a formation noted elsewhere in chalk cavities.

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Abbotscliffe, Dover, Kent – Hanging Face Caves

Location NGR TR 2939

Access A steep path descends the cliff at TR 282388. The cliff face can be viewed from the sea wall alongside the railway which runs at the foot of the cliff.

Description R.H.A. Staniforth mentions the name "Hanging Face Caves" in his climbing notes, but the exact location is not given: only the fact that they are situated halfway up the cliff.

There are in fact three openings halfway up the cliff behind the railway, which are almost certainly the ones referred to. Viewed from the sea wall they appear to be natural features and are all in the same band of nodular chalk which stands out from the cliff face.

They have yet to be examined due to their inaccessible position; though anyone with climbing experience should be able to reach them.

Lower Ensden, Kent - swallets

Location Several small brooks drain a wooded hillside and sink into large swallets at the junction of the Tertiaries and the Chalk.

Take the bridle path from Lower Ensden Farm to Joan Beech Wood and follow the edge of the wood eastwards towards Nickle Farm. The sound of water falling into the first hole can normally be heard from the bridle path. This particular stream is large enough to be marked on the O.S. map.

Most of the holes are located near the edge of the woods, which follow approximately the Tertiary/Chalk boundary.

Access Permission to visit the swallets should be obtained from the occupier of Lower Ensden Farm - a Mr. Rickard at the time of writing.

Descriptions

TR 076562. The stream feeding this swallet has been utilised by the farmer to fill a small reservoir in the corner of the wood. When this is not in use a sluice gate allows the stream to continue on its natural course to a swallet in the adjoining field, where it flows down a steep-sided gully and sinks in holes up to 2ft. in diameter in the muddy floor of a depression some 50ft. wide and 25ft. deep.

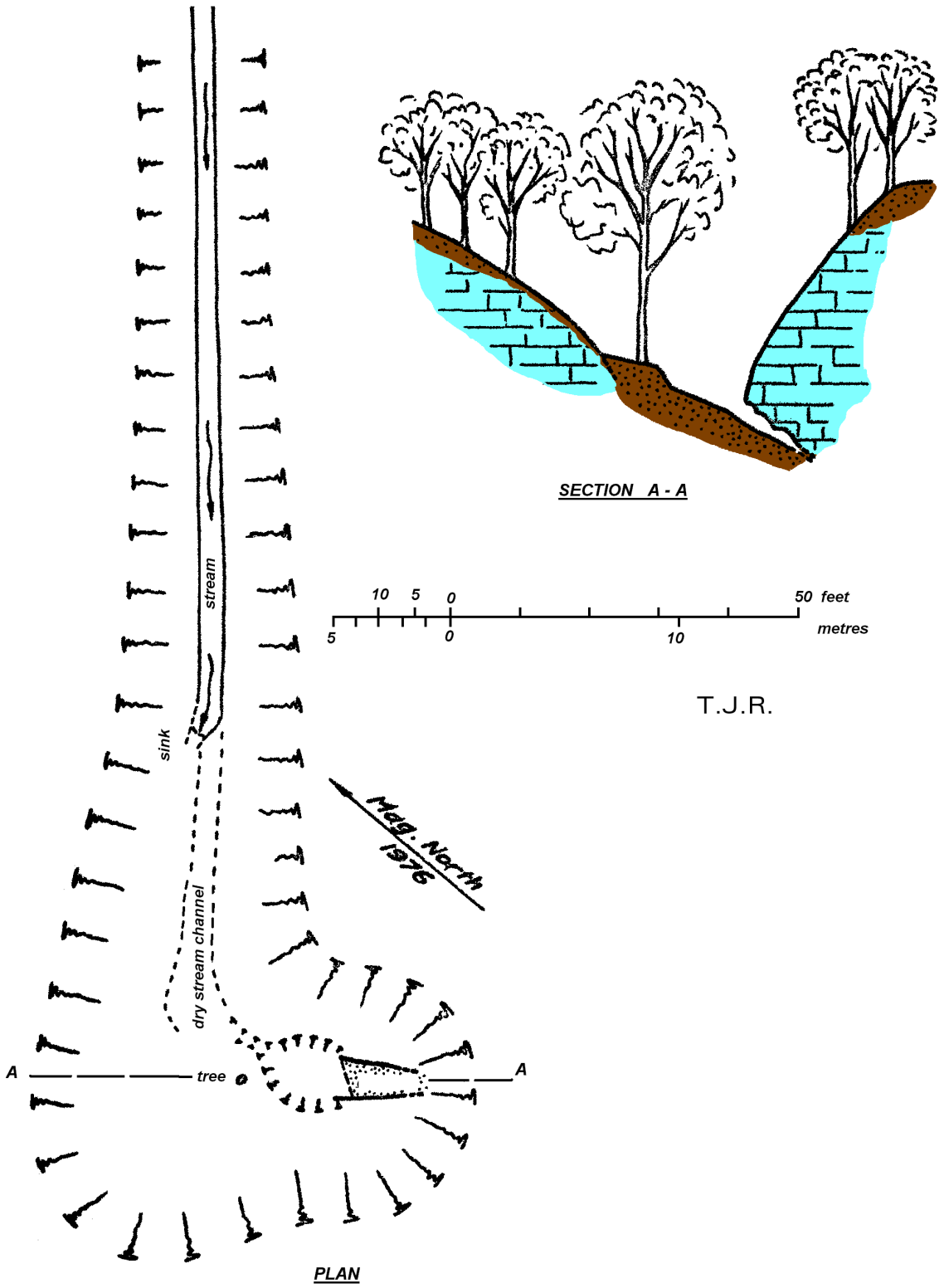
The sides of the swallet are heavily overgrown with brambles and nettles, masking the geological strata. A few feet of moss-covered chalk is exposed at the lower end with a 10in. wide clay-choked fissure showing above the mud floor.

In wet weather the flow reaches considerable proportions and a large whirlpool forms above the main outlet. There is a noticeable draught in the vicinity of the sink holes.

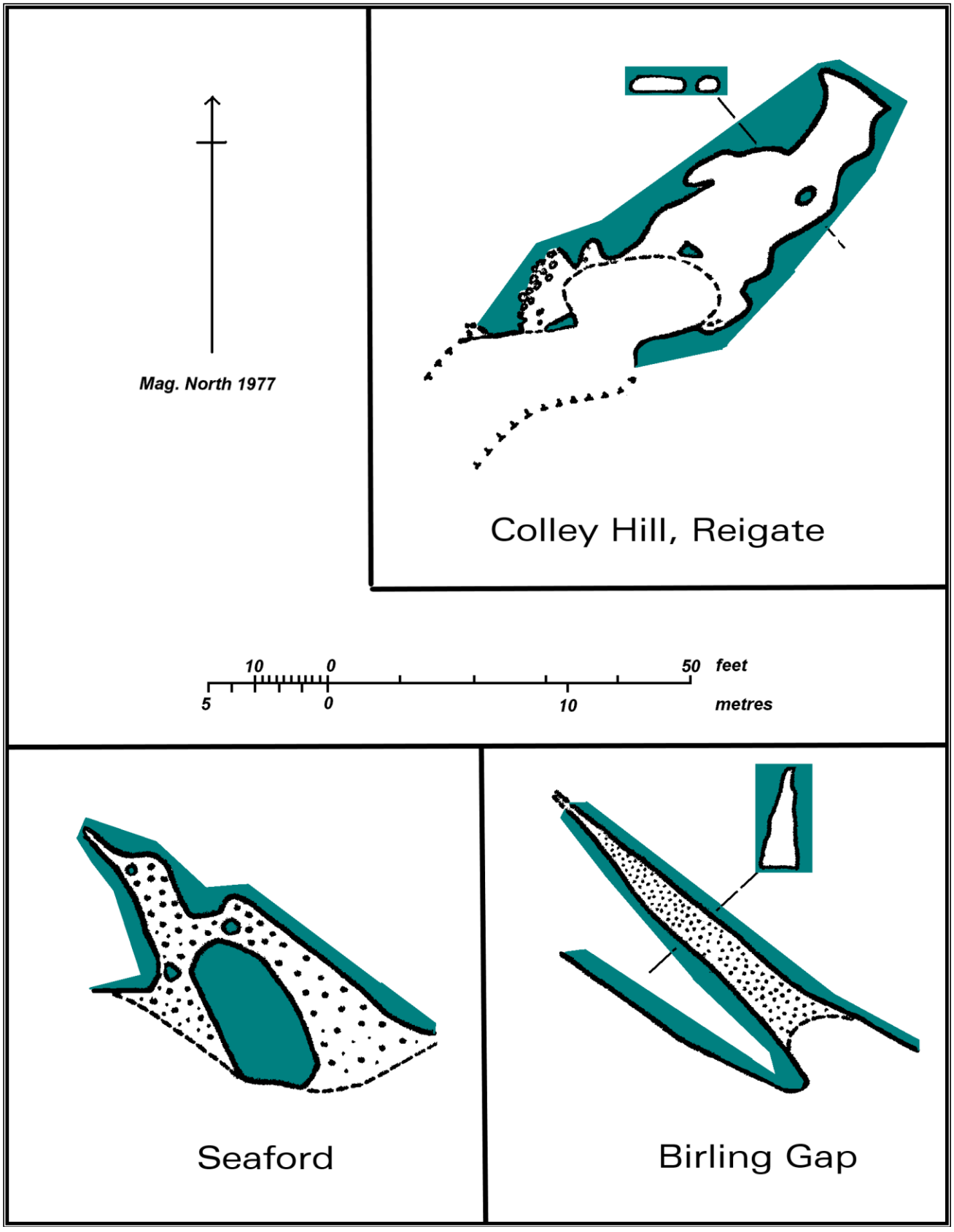
TR 077562. A fenced hole approximately 8ft. in diameter and 8ft. deep is in a hedgerow. It is probably formed by the collapse of a chamber rather than as a true sinkhole. In conversation Mr. Rickard made reference to a sudden collapse, which he probed to a depth of at least 20ft. using a hop pole. This hole is probably the one he was referring to.

TR 079563. A fair-sized brook sinks in a fenced-off, marshy depression on the edge of Bower Wood.

TR 081562. Two large depressions in the wood where it adjoins the railway are probably abandoned swallets.



Lower Ensden Swallets, Kent


Mag. North 1977
Colley Hill, Reigate
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Seaford
Birling Gap

TR 082564. See illustration. Stream disappears under tree roots in the side of a large gully leading to a 60ft. wide, 40ft. deep swallet in the corner of the wood. The abandoned course of the stream continues to the mouth of a small cave situated at the bottom of a steep, semi-circular, chalk cliff, which forms the south-east face of the swallet.

The cave measures 4ft. wide and 2ft. 6ins. high. It is some 10ft. long and is choked with sediment at the end. It is formed in solid chalk along a joint, trending in a south-east direction.

TR 083563 A stream sinking under brambles at the end of a typical blind gully.

TR 083562 An enormous bowl-shaped pit approximately 150ft. long, 90ft. wide and 30ft. deep. It is now used as a tip by the farmer. There is no stream gully leading into it, which suggests that it might be a collapsed "doline".

TR 088564 A stream flows south-eastwards in a valley heading towards Nickle Farm. The actual sink was not examined.

TR 091554 A chalk spring close to the road on a bank of the River Stour. This could be a resurgence from the swallets.

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Seaford, Sussex - sea cave and "pipes"

Location TV 494978. In the cliffs of Seaford Head a few hundred yards beyond the end of the sea wall at Seaford.

Access Unrestricted but inaccessible at high tide.

Description A roomy sea cave about 70ft. long formed in massive, brilliant white chalk.

There are also many fine examples of the fossil solution cavities which geologists call "pipes" sectioned in the cliff. These carrot-shaped vertical shafts up to 40ft. deep are filled with the Tertiary sediment known as clay-with-flints. In some cases the sediments have been washed out revealing the true shape of the holes.

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Colley Hill, Reigate, Surrey - cave see illustration

Location TQ 244522. In a steep-sided coombe on the south face of the North Downs.

Access Colley Hill is owned by the National Trust and is therefore open to the public. However a notice has been placed near to the cave which reads:- "***DANGER. This cave is unsafe. DO NOT ENTER***" The entrances are also currently fenced off with barbed wire.

Description The cave was originally noted by Alan Ockendon of the Croydon Caving Club in November 1966 following a subsidence. This gave access to a chamber in chalk which was apparently natural. This measured some 30ft. long and was from 2ft. to 5ft. high. (C.S.S. Records 5/66-7).

When revisited in 1975 it was found to have deteriorated considerably and consisted of two small cavities in the side of a collapse. (C.S.S. Records 7/21-3).

In 1977 Paul Sowan received a letter from the National Trust asking his advice on the feasibility of using explosives to seal off a cave on the hill, which they described as being 15m. long! A subsequent visit revealed that the cavity was at the upper end of the original collapse and had grown to 35ft. Either this new extension had formed in less than two years, or erosion at the top end of the collapse had revealed another completely isolated chamber.

As with the original cave the new extension followed the slope of the hillside, with its roof never more than a few feet below the surface. It is formed in the frost-shattered zone overlying firmer chalk which takes up the floor of the cave. The roof and walls are coated with a soft formation resembling cobwebs.

The caves owe their existence to the extreme steepness of the escarpment which allows very rapid run-off at times of heavy rainfall. There are numerous scars and depressions on the face of the Downs hereabouts which may also be the result of collapsed caves.

Survey B.C.R.A. Grade 5d.

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Seaford, Sussex - sea caves see illustration

Location TV 510973. In the cliffs of Seaford Head to the east of Seaford.

The caves are best approached by taking the cliff-top path and descending to the beach by the steps near the mouth of the River Cuckmere. Then head back along the beach towards Seaford.

Access Unrestricted but there is considerable risk of being cut off by the tide.

Description The caves comprise a 65ft. long, shingle-floored sea cave with two entrances (see survey) and two smaller sea caves perhaps 20ft. to 30ft. long. Along the joints in the roofs of the smaller caves are some circular holes up to 9ins. in diameter, through which daylight penetrates from the sloping cliff face above. These features are the result of a small stream running over the cliff edge in wet weather.

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Birling Gap, Sussex - sea caves see illustration

Location TV 549961. An obvious cave entrance in the cliffs to the west of Birling Gap Car Park.

Access Access to the beach is either by a temporary stairway constructed during the summer months, or a dilapidated ladder in winter. The cave is not accessible at high tide.

Description The sea cave is 46ft. long formed along a joint running parallel to the cliff.

Survey B.C.R.A. Grade 5d.

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St. Pauls Cray, Kent - Cookham Wood swallet

Location TQ 491695. In Ruxley Manor Golf Course adjoining Cookham Wood.

Description This is one of several swallets mentioned by Whittaker. A small brook, flowing in a north-west direction from Crockenhill, now sinks in a shallow depression just outside the wood. An old O.S. map shows it sinking in the south-west corner of the wood, but it is the boundary that had changed rather than the location of the swallet. The wood is now a refuse tip.

Reference WHITTAKER *'Kent Water Supply'* 1908

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Mickleham, Surrey - River Mole Swallets

C.C. Fagg F.G.S. devoted a considerable amount of time and effort to a study of these swallets during a period of residence at the Juniper Hall Field Centre from 1948 to 1950. His observations during this period are the subject of an excellent article in the 'South Eastern Naturalist and Antiquary'. This includes many surveys, maps and photographs.

The following extracts from Fagg's paper relate to various cavities in the chalk.

The first is concerned with a collapse which occurred in the bed of the river at the foot of the steep cliff at Ham Bank at TQ 161526 on the night of August 19th/20th 1948, which subsequently swallowed the entire flow.

".....At dusk on August 19th the river was flowing right through to Leatherhead. The swallow was on the slightly depressed surface of the bed, but in the early morning of the 20th an area of 9ft. radius around it had caved in to a depth of 6ft. at the deepest point. At other places similar subsidences had taken place at many times in the past. The slightly acid river water is continually dissolving away the chalk below the swallets until large cavities develop, and sooner or later subsidence occurs.

Before softening, the water pumped from the chalk at Leatherhead contains over half a ton of dissolved chalk for every million gallons. In this case the crater was still more than half full by morning and being fed by the greatly reduced flow of the river and by a small stream flowing backwards from a downstream pool. The swallow was gaining on this dual supply, and by the evening there was only a puddle in the crater, crammed with jumping fish; while the sides were strewn with dead and dying fish....."

It was further recorded that "…..This was the only time in 1948 that it (the river) ceased to flow beyond Ham Bank, though in the lower reaches it dried up again three times on August 28th and September 9th and 20th....."

Another interesting hole appeared in the flood plane in the vicinity of Cowslip Bank TQ 164531, during the most violent flood in living memory on October 27th 1949.

"It is in an old course of the river and, as the flood subsided, water was pouring into it from both directions….

..The diameter at the top was 7ft. and its depth 14ft. to the oblique opening into the chalk into which I was able to insert a rod for 4ft. 6ins. The sections exposed on its sides were revealing. On the north side there was 2ft. 9ins. of sandy alluvium resting upon 3ins. of broken chalk and 2ft. of broken flints and alluvium. Below this was the Chalk. The broken chalk and flints are just like the present river bed but 4ft. 6 ins. higher.

On the south side however, only 7ft. away, the face was entirely alluvium from top to bottom. Clearly the flood had opened up an ancient swallow. At the time when the river flowed in this old course the river cliff must have been 80ft. west of the present cliff....Since that time the river has shifted its course by that amount and deepened its bed by 4 ft. 6ins.

The farmer, Commander Woodall R.N., was going to fill in the pit, but instead generously fenced it round so that I could keep an eye on it and show it to students. At times when the river was dry, the pit and its outlet were empty, but when it was flowing normally, water rose in the pit to a depth of 3ft. 2ins., that is about 8ft. below the level of the water in the river. The water that thus appeared periodically in the pit had been swallowed upstream, for it brought with it living minnows.

The opening of this pit threw a flood of light upon the famous pit in the constable's garden at Mickleham. This much bigger and deeper pit, half a mile away from the present river and 60ft. higher, caved in, swallowing a big tree in February 1947. The Cowslip pit gives, I think, the key to the mystery." Note the words 'caved' and 'swallowing'.

Mention is also made of a cavity found under the railway bridge at Norbury Park.

".....The support of the bridge on the left bank was originally placed unwittingly over a huge solution cavity in the chalk, and it was later necessary to fill this with many tons of concrete to ensure the safety of the bridge....." Box Hill is also mentioned where ".....a similar need arose when the by-pass road was being constructed near Burford Bridge....."

The area was visited by the present author on several occasions during the drought of 1976. The only obvious swallets at that time were situated at the base of Ham Bank, where large volumes of water drained away into rubble-choked cavities. There was no trace of the "Cowslip" pit and it is assumed that this has now been filled in by the farmer. The site of the Policeman's Hole was still discernible at TQ 172534, though almost filled to the brim with rubbish.

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Mymmshall Swallets, Herts see illustration

Location Near Waterend. Marked on O.S. map at TL 232044.

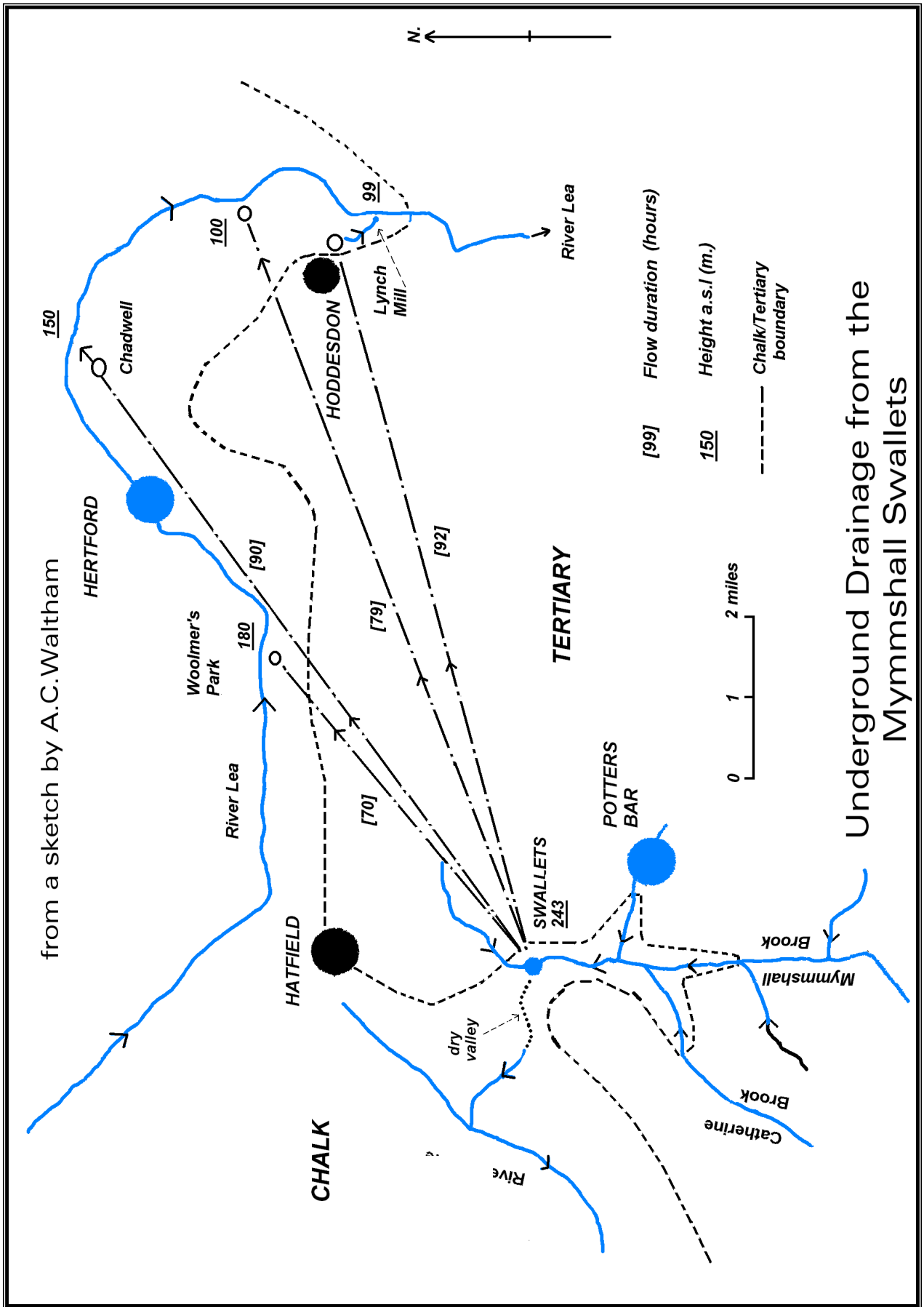
Description The following abstract is taken from an article entitled "Caves and Swallets on Chalk" by Tony Waltham, which was originally published in the Journal of the London University Caving Group. It is reproduced by kind permission of the author.

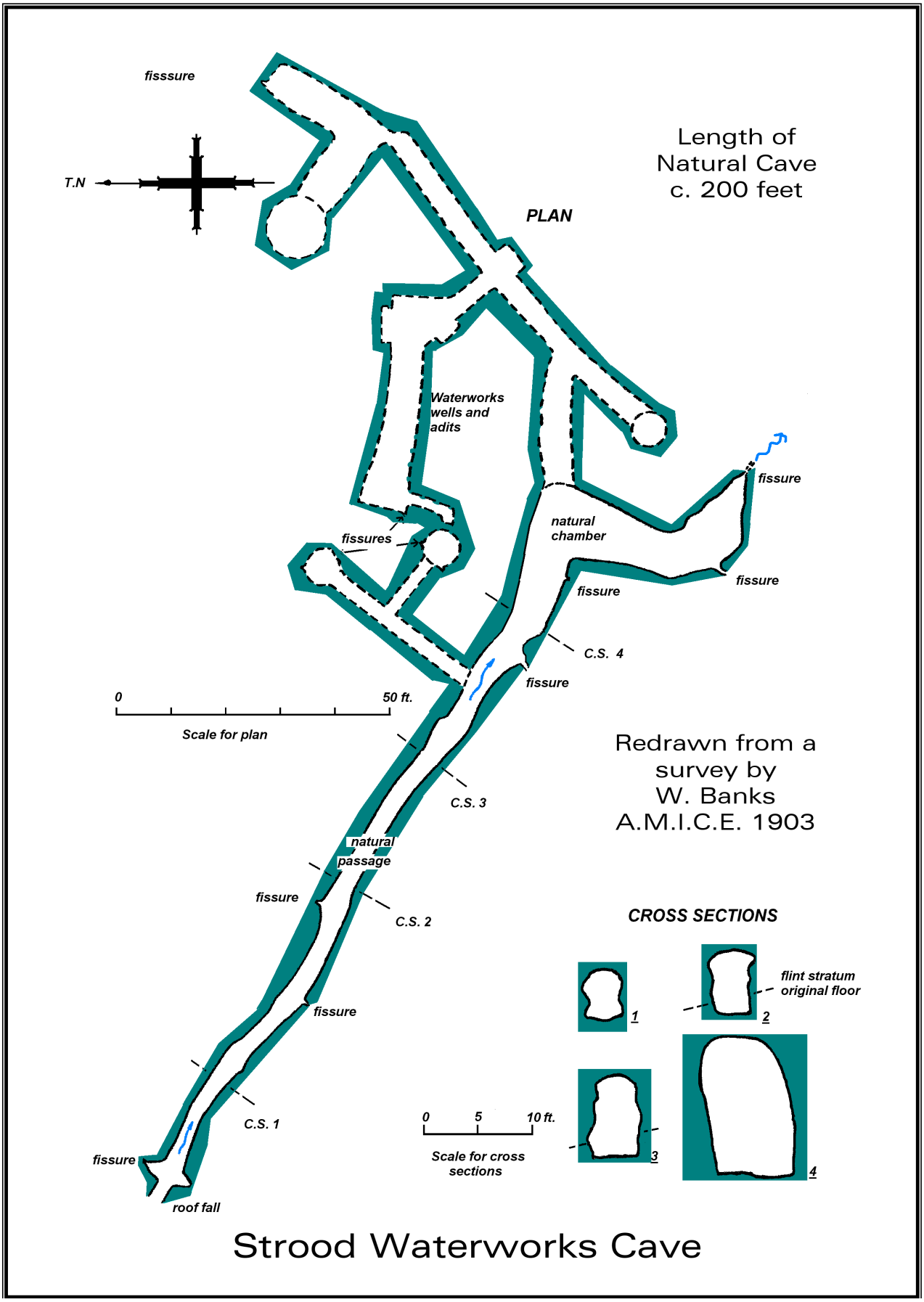
".....The water collects on the Tertiary Clays and flows northwards to where the valley has been cut down into the Chalk. Here the Chalk is presumably relatively free of fissures, for the stream flows over it for about two miles in a valley now partly filled with sandy alluvium. But at Waterend the entire stream normally sinks in the Mymmshall Swallets.

There are three major sinks and about fifteen minor ones spread over an area of about five acres. The principal sink, which takes most of the water in normal weather, is at the end of a classic blind valley cut 20ft. deep in the alluvium - a most inspiring sight to the cave hunter. This has been seen to engulf a flow of about 1.5 cusecs (similar to an average wet Swildons) when the water can be heard flowing away underground. The passage is extremely small however and often choked with rubbish, but digging in the past has permitted entry for a few yards, the stream then flowing away enticingly in an impossibly small cave.

In winter the stream may swell to about 150 cusecs, which cannot pass down the swallets, and hence a lake may develop a few hundred yards across and up to 30ft. deep, which then overflows down a normally dry valley to the west. This valley was the original course of the Mymmshall Brook.

Some years ago dye was introduced into the swallets and the results are shown on the accompanying sketch map. The underground courses therefore range between 5.5 and 10.5 miles in length, with a drop of 64 - 145ft. The fact that one group of swallets (with most of the water and dye going down one sinkhole) feeds four widely spaced risings, suggests that the water is passing through a saturated zone of rock with complex multi-directional flow in microfissures and a maze of larger fissures.


Underground Drainage from the Mymmshall Swallets
from a sketch by A.C.Waltham
N.
Flow duration (hours)
[99]
Height a.s.l (m.)
150
Chalk/Tertiary boundary
0
1
2 miles
TERTIARY
CHALK
HERTFORD
Chadwell
150
Woolmer's Park
180
River Lea
[90]
[70]
HATFIELD
[79]
[92]
HODDESDON
100
99
Lynch Mill
River Lea
SWALLETS
243
POTTERS BAR
dry valley
Mymmshall Brook
Catherine Brook


fisssure
T.N
PLAN
Length of
Natural Cave
c. 200 feet
Waterworks
wells and
adits
fissure
natural
chamber
fissures
fissure
fissure
C.S. 4
fissure
0
50 ft.
Scale for plan
Redrawn from a
survey by
W. Banks
A.M.I.C.E. 1903
C.S. 3
natural
passage
fissure
C.S. 2
CROSS SECTIONS
flint stratum
original floor
1
2
fissure
C.S. 1
0
5
10 ft.
Scale for cross
sections
3
4
fissure
roof fall
Strood Waterworks Cave

In other words a discrete cave system is unlikely to exist for the entire underground course. On the other hand the rapid flow-through times suggest that there is significantly large passage permitting rapid, easy, vadose flow for at least some of the route - probably in the initial stages, and it is this possibility which appears to present the best chance of discovering a significant chalk cave in England.

However we cannot necessarily assume to find vadose passages leading down for 65ft. in depth to a rest level at the height of Woolmer's Park resurgences; the system of microfractures, which the water must pass through for some of its course, could impose a considerable hydraulic drag on the flow and thus result in a distinctly inclined water table. In this case the passages may be waterlogged at very little depth below Mymmshall Swallets."

Waltham also notes that the swallets represent the largest enclosed karstic drainage basin in England. The catchment area is 17.9 sq. miles, compared to 12.6 for Goyden Pot.

The Croydon Caving Club carried out a resistivity survey of the area in 1970 and published the results (see bibliography).

Three of the swallets collapsed in 1928 and were described by D. Evans:-

".....The most thoroughly investigated proved to be 36ft. deep with a diameter at the surface of 22ft. narrowing rapidly downwards to just sufficient space for a man to descend on an almost vertical ladder....."

A very fresh -looking collapse was examined by the C.S.S. in May 1975 shortly after the area had been flooded. This was descended with a 12ft. wooden ladder that just happened to be lying among the rubbish that accumulates in the vicinity of the swallets.

The hole measured 5ft. by 8ft. at the surface, opening to 10ft. diameter at the base, and was 10ft. deep. The top 8ft. was in clay with crumbly chalk showing underneath. The bottom of the hole was floored with freshly broken clay and chalk rubble, and there can be little doubt that the collapse was the result of a solution cavity in the chalk below. When visited a year later the sides had fallen in leaving a shallow, muddy depression.

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Strood Waterworks Cave

see illustration

This was described in some detail in C.S.S. Records Volume Six. It is therefore referred to here only for the sake of completeness. The redrawing of the survey has been greatly improved and is published herein.

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The Hertfordshire Bourne

The following article appeared in Vol. XXV of the Transactions of the Hertfordshire Natural History Society. It was written by Brigadier E.A. Glennie, an Honorary member of the C.S.S., who gave permission for it to be reprinted

"A few years ago a pumping station was installed in Chesham Vale (SP 957055) at a ground level of about 424ft. above O.D. Pumping here seems to have stopped the flow of the Chesham Bourne. Water level in a well 600yds. away in the Rossway direction dropped considerably, but there was no effect at all on the Rossway Well, Berkhamsted (SP 959072), where the water level in 1959 rose to 471.5ft. above O.D., and in 1951 after the snow melt to 479ft. This well is 175ft. deep and the depth of water since the war has varied from a minimum of 10ins. to 84ft. A rise and fall of 60ft. in a year is not unusual. The Rossway Well taps a locally perched water table, below which water flows down dip towards the Bourne Gutter. There is a direct correlation between Rossway levels and Bourne flows in the upper parts of the Hertfordshire Bourne.

On 30th January 1959 water in Rossway Well, rising at about 8.5ins. each day, was within 2ft. of its level at the time of the beginning of the 1951 Bourne flow, so Rossway Well levels and the Bourne Valley were kept under observation.

Water levels at Rossway reached 471.5ft. on 31st January 1959, and further rise ceased, the level remaining unchanged for two weeks, after which water level began to drop at half the previous rate of rise. In 1951 a similar discontinuity occurred. Evidently some unusual event takes place when the water table at Rossway arrives at this level, as though an overflow pipe operated to prevent further rise.

The following springs and rises are associated with the Hertfordshire Bourne:-

	Location	***NGR***
1	*Hockeridge Bottom Rise*	*SP 983055*
2	*Banks Rise*	*SP 989051*
3	*Corner Spring*	*SP 988051*
4	*Culvert Rise*	*SP 991055*
5	*Mounts Rise*	*SP 995057*

On 30th January there were already signs of flooding in the fields of the Bourne Valley near the White Hill culvert and elsewhere, but this was due to soil water seepage down the valley slopes, the ground being seriously waterlogged after a cold summer and a very wet autumn. Banks Rise was dry and the Corner Spring, first noted in 1917, was not flowing. This is a genuine spring, which in 1951 flowed up from an opening over 4ft. below ground level into a basin, and then flowed over in a runnel to the lower part of the valley below. Here in 1951 were obtained the rare Ostracod, Eucypris crassa O.F. Muller, and the Copepod, Cyclops gigas latipes Lowndes, which have so far escaped mention in the records for Herts. The Ostracod had been found once before in Britain. Since 1951 this spring has been filled in and ploughed over, and was found as a soggy depression about 6ins. deep covered with a thick layer of ice.

On 2nd. February, although the air temperature was still near freezing point, the ice melted, showing that the ground water spring was operating. Owing to the bad state of the ground round the spring, little actual flow was visible, but it was more noticeable four days later. The only fauna now obtained was the common Copepod - Cyclops vernalis Fischer.

On 5th February Banks Rise reached its highest point. It required another 6in. rise before it could have flowed over the raised rim of the basin, but a strong flow of water flowed outside the rim at the same level.

On 15th February the Rossway Well levels were falling at about half the rate of earlier rise, and by March 7th Banks Rise had fallen1ft. and the seepage water outside had retreated to the same extent, and then flowed by the hedge for about 50yds. before dropping abruptly underground like a swallet stream. Flow continued from the Corner Spring.

Between 5th and 7th March a fair-sized lake had formed around the site of Lake Rise.

This lake is, I think, due to damming up by the embanked road, which has reduced flow in the gravels below. All this part above the culvert dried rapidly and by 13th March Banks Rise was again dry. Flow above the culvert had stopped but it continued below the culvert.

Turning attention now to the Gutter downstream of the culvert, flow had commenced about 31st January and increased rapidly as Banks Rise and Corner Spring became active. The Bourne Gutter passes along one edge of the big Mounts Rise basin and flooded into it before Mounts Rise began to flow. This was fortunate, since the actual emergence of Mounts Rise, which I describe below, would otherwise have been missed.

From the evidence of 1951 I had decided that Mounts Rise was the most important spring in the Bourne Valley. On the afternoon of 6th February careful examination showed that no water was flowing from this spring into its flooded basin. The gutter stream was flowing in a stream about 5ft. wide rippling past the edge of the basin remote from the Mounts Rise with a slight eddy in it.

Having decided that there was no flow from Mounts Rise I turned back to go home, but after going for about fifteen paces I looked back. For a few moments there was no change, and then it happened. A column about 12ins. in diameter, composed of fifty or more streams of bubbles rose up in the pool. Then another, and another, until there were four of these a yard or more apart. The three nearest to the fence at the foot of the hill slope were about a yard from it out in the pool. Sometimes one or other of the columns sank down but immediately rose up again, and on one occasion the outer column sank down completely and rose up about 2ft. away and then, in a few seconds, returned to its original position. This went on for about five minutes. I had realised that a mass of water advancing down a siphon passage in the chalk was driving air before it and that the complete disappearance of the air columns would herald the actual flow of water. At 3.20 all four columns sank down simultaneously. At least that was the illusion. Actually of course the air bubbles stopped and the vanishing must have been upwards!

There was no obvious upheaval of the water, but looking towards the gutter stream I saw that the ripple track had been pressed against the further bank and reduced to about one quarter of its original width, and then a strong flow out from the basin became evident at the downstream side into the Gutter with an obvious increase in the stream. This observation was such an incredibly lucky chance that I have given it in full detail....."

" In 1883 Dr. John Evans (Trans. II, 57) said, with reference to the Hertfordshire Bourne, "It must not be inferred that there is anything like a cavern full of water in the Chalk". The evidence of Mounts Rise however indicates some moderately large stream passages in the chalk. Furthermore at Waterend watercress beds, when a boring tool had penetrated 30ft. into the chalk below the beds, the boring tool dropped into a wide cavity more than 10ft. deep......"

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Bigberry Wood, Kent - swallet

At TR 113569. A small stream feeds a pond in a private garden. The overflow from the pond sinks at the end of a channel in an adjoining field.

The pond and swallet can be seen from a public bridle path running alongside the field and garden.

Along the southern edge of Bigberry Wood there are numerous, rubbish-filled depressions with chalk showing beneath the Thanet Sand.

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Note on British Cave Research Association survey gradings

The B.C.R.A. has published a standard list of grading numbers for cave surveys. The full list can be found in "Surveying Caves" by Bryan Ellis 1976 ISBN 0 900265 03 5. The grades quoted in this publication fall into the following categories:-

2 Sketch with estimated measurements.
3 Rough magnetic survey.
Horizontal and vertical measurements to +/- 2.5°;
distances measured to +/- 50cm.;
station position error less than 50cm.
5d Magnetic survey with angles accurate to +/- 1°;
distance +/- 10cm.;
stations +/- 10cm.
Other significant features measured.
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Arch. Cant. **1** 138 Quote "*Along the water course under Camden Road (Chiselhurst, Kent) the stream is here and there lessened in volume, and one may observe the water engulfed on one side of the bank or the other , in what are termed in various parts of the Kingdom, swallet or swallow holes*."

British Caver (6) 70 & (9) 3. Re. O.S. Map 305 n.s. Geol. map 3. "Cave at Knockholt, Kent". Describes a 350ft. deep well in chalk with a natural cavity at 270ft. It is 30ft. long, 12ft. wide and 18ft. high with a stream of water.

Mendip Caving Club Journal (2) - The Policeman's Hole, Mickleham, Surrey.

Chelsea Speleological Society and London Speleological Group Records.

Vol.	Year	Pages	Details
1	1956	18-20	Notes on North Mimms swallets, Herts., 8 refs.
3	1963	18	Farnham, Surrey swallets - 2 refs
3	1963	39-40	Mickleham, Surrey - the Policeman's Hole 1 ref,
3	1963	54-6	River Mole swallets , Surrey- 6 refs
4	1966	6-7	Notes on natural chalk caves – 3 refs.
5	1968	34-6	Farnham Park swallets, Surrey - survey
5	1968	75	River Mole swallets - 1 ref.
6	1973	4-6	Flittermouse Hole, Harvel, Kent - survey
6	1973	20-2	Caverns at Blackheath, London - survey - 2 refs
6	1973	22	Cave at Knockholt Pound, Kent
6	1973	56-8	Cave at Pegwell Bay, Kent - survey
6	1973	60-3	Strood Waterworks cave, Kent - survey - 2 refs.
6	1973	70-1	Ightham rock fissures, Kent - 7 refs
6	1973	71-3	West Malling/Loose hydrology, Kent - survey
6	1973	77-8	Kent sea caves - 2 refs.59
6	1973	94	Ramsgate sea cave, Kent - 1 ref
7	1976	15-16	Oldbury rock shelters, Kent - survey
8	1978	9	Parson Darby's Hole, Beachy Head, Sussex - 4 refs

Chelsea Speleological Society Newsletter

Vol.	Year	Pages	Details
3	1960	1-3	Strood Waterworks
3	1960	18-23	North Foreland Sea Caves
3	1960	30-3	The Hertfordshire Bourne
3	1960	86-92	South Foreland sea caves
3	1960	102-4	Lydden Spout
4	1961	3-8	Kent coast caves

"Kent Water Supply" - references to swallets etc.

Bigberry Wood

At Chartham TR 113569. Holes at S.W. corner passing through 25ft. Thanet Sand to Chalk. "with subterranean streams that may be heard at the bottom." Also swallets at the foot of the hills S. of Boughton Street.

Lower Ensden

Additional swallets noted E. and N.E. from Hatch Green to Dinstead and Fishpond Farm including one in Howfield Wood.

St. Mary Cray Swallow hole in the valley S.E. of the station.

Springhead

Northfleet TQ 617726. Site of Roman settlement at the source of the Ebbsfleet. Chalk spring estimated at 7M. gals. daily, which has now ceased to flow.

Swanley

Powerful swallow S. of Birchwood Corner half a mile N.E. of Swanley Station.

West Bere Marshes

Reference to pools called Nicker Pits. Fresh water risings feeding the River Stour. "An eel pot lowered 17 rods did not reach the bottom." Also refers to 'Geologist vol. III 1860 p276.

Whorley Hole Half mile N.E. of Farnborough Church.

Woodnesborough

Large swallets noted. Reference to Geol. Mag. dec iii vol.IV 1887 p204.