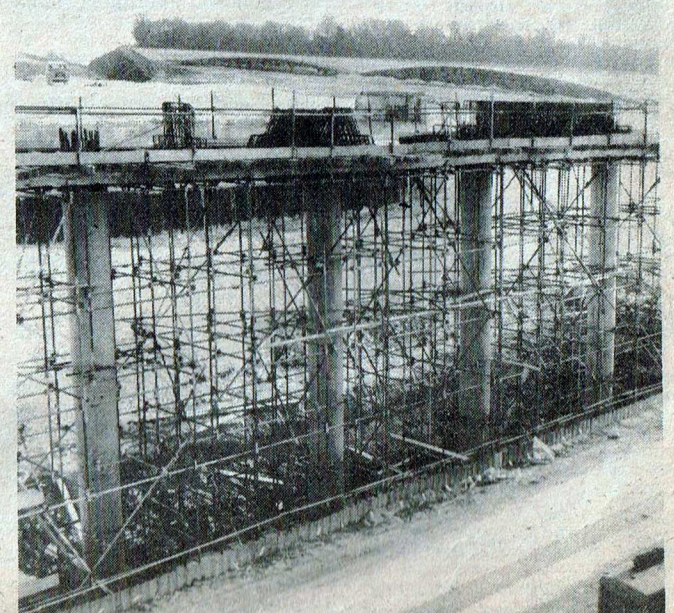
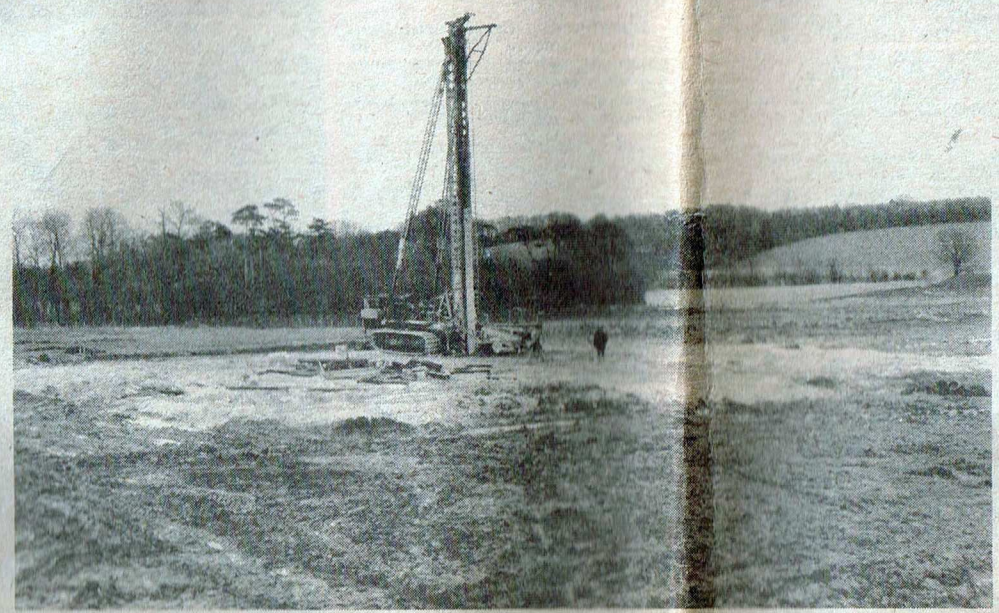


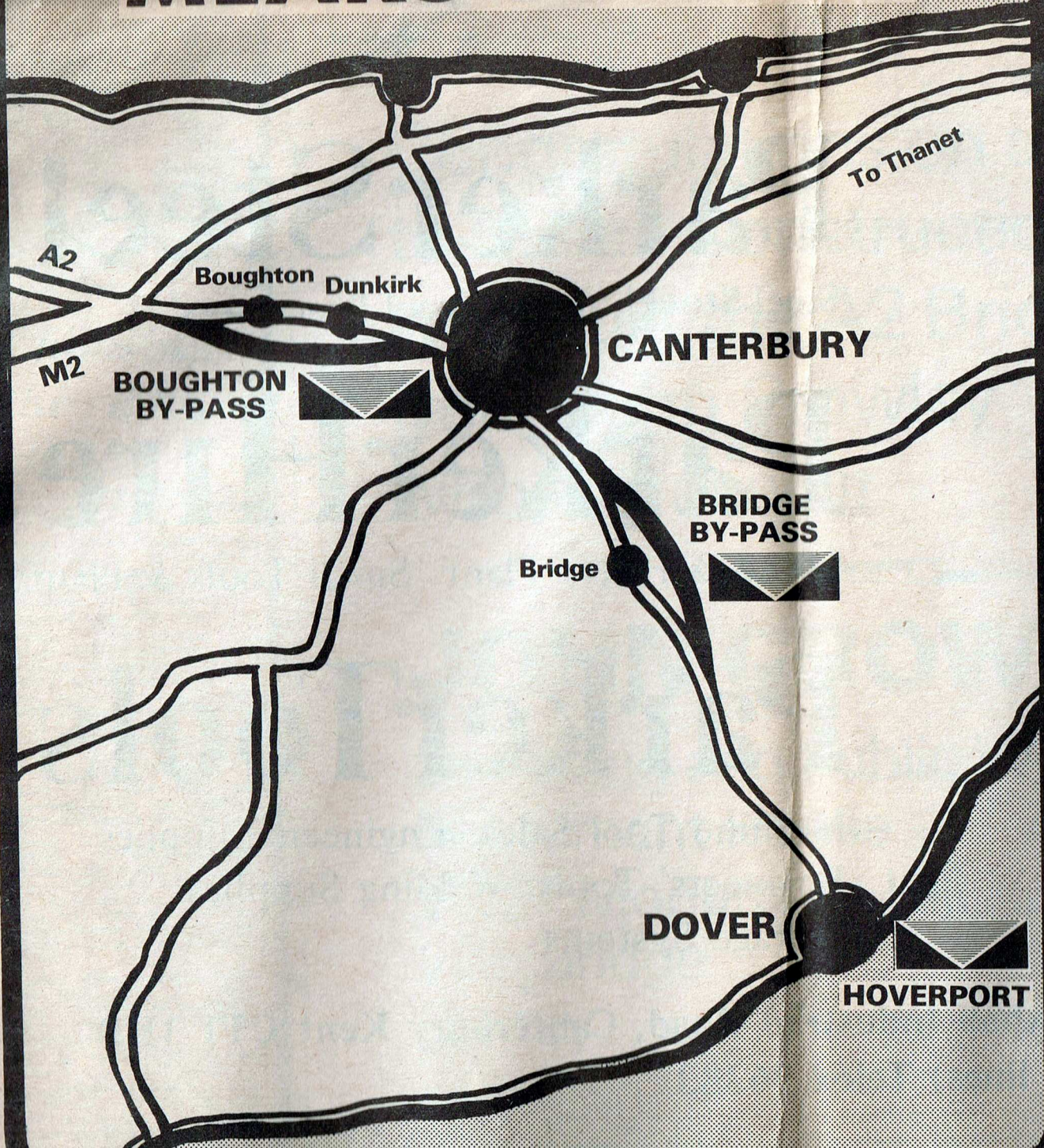


A variety of views of work on structures on the by-pass. Five bridges were necessary to separate through traffic from local traffic, farm vehicles and pedestrians. All are concrete, with particular attention paid to surface finishes. The picture on the far right shows the newly-constructed columns of Patricbourne Road bridge, as seen in December, 1975. Top right: The agricultural subway as it was nearing completion. Above: A tricky manoeuvre as beams are negotiated round Patricbourne Road on their way to the by-pass structures. Near right: A view of piling to Bifrons Park agricultural subway in November, 1974.



Day the rains came

MEARS in KENT



Day the rains came

Heavy rain greatly hampered work between late autumn 1974, and spring the following year.

During that time, twice the normal amount of rain fell soon after construction work had begun. Swollen streams fed the Nailbourne, which is seldom more than a trickle.

In four days, at Christmas, 1974, the Nailbourne filled up and then overflowed onto the surrounding fields, causing extensive flooding in the valley workings.

It was April before the water started to disappear from the fields and a full year from the time of the initial flood before the Nailbourne reverted to being a ditch with a little water in the bottom.

Wide-ranging revisions were made to the construction programme as soon as it became obvious that the flood-water was there to stay for some considerable time, and delays were kept to a minimum as a consequence.

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A journey into the past

by

Nigel Macpherson-Grant

An Iron Age settlement and two Bronze Age barrows were uncovered during work on the by-pass, as well as two ancient cemeteries.

The glimpses into past life on the chalk downs above the Nailbourne Valley have been excavated and recorded by Canterbury Archaeological Society, on behalf of the Department of the Environment.

Members were asked to keep watch during topsoil stripping and to excavate and record any archaeological features. The society's work was greatly helped by the co-operation it received from the staff of Mears Construction Ltd and their sub-contractors, Messrs Blackwell.

Four main sites and a number of minor archaeological features were recorded. Of the former, two were cemeteries, one certainly, the other possibly, Saxon.

One — the already known Kingston Saxon cemetery was expected to be badly disturbed and the excavation conducted in 1974 showed that previous disturbance or robbing had been very thorough. The only new information was provided by the presence of two cremation burials, contained in pots.

The second cemetery lay on a hill slope overlooking Bridge and the Nailbourne Valley — here 22 graves were exposed. Because they had been robbed it was impossible to date them accurately, but a Saxon one is not unlikely.

There were, however, two main sites, new and relatively unexpected whose discovery made the whole operation worthwhile. One was a small Iron Age settlement and the other two Bronze Age barrows.

The Iron Age settlement, approximately dated by pottery to c500 to 400 BC, was sited on a spur of 250 foot chalk downland, overlooking the north-east to south-east prehistoric ridgeway.

In siting the settlement its builders appear to have deliberately avoided an area of head brickearth which backs on to the occupation area. This is a stiff

would have acted as a barrier and windbreak on the north and north-west side of the settlement.

Ironically, much of the settlement area lay beneath Mears' office compound and some of this was lost before adequate recording.

However, clearance for the adjacent caravan compound revealed the north-western perimeter ditch of the settlement and a second ditch-bounded compound with a southern entrance, which was appended to the main settlement area and may have been a livestock enclosure.

Excavation revealed the following sequence:

(1) A series of irregular hollows were dug, or caused by uprooting trees during the primary phase of occupation. These were intentionally back-filled with rammed chalk and earth containing a few scraps of pottery.

(2) A ditch was cut (the main perimeter ditch) partly through these hollows, averaging about three to four feet deep, and as a barrier, serving more as settlement demarcation than as a defensive structure.

(3) The ditch gradually filled in, without any re-cutting and towards the end of the settlement occupation became a convenient rubbish dump for domestic refuse.

Two pits were of interest: One contained a disturbed child burial, the other was circular and four feet deep. This contained four successive layers of ash, burnt flints and clay — each layer interspersed with deposits of pottery and bone and accretions of soil and weathered chalk. This suggests a seasonal or feusidic activity such as renewing the domestic supply of pots.

The occupation of this site, if at all continuous, may have been for approximately 25-30 years and probably considerably less. For the area excavated quite a useful series of pottery was recovered, adding to the growing amounts of Iron Age pottery from East Kent.

The pottery is broadly divisible into two groups, with appearance related to function.

group of bowl-shaped vessels — some used as cups or for serving food. The treatment of some of these bowls is rather fine.

Before firing, a paste was made of ground haematite and added as a coat to the surface of the pot. This was then burnished to a shine with a pebble or piece of bone.

The resultant effect gave the vessels a coppery appearance, deliberately copying in colour, decoration and bowl-shape bronze bowls used by more prosperous members of Iron Age communities in this country and abroad.

This particular tradition of red-haematite-coated pottery seems persistent throughout south-eastern England and occurs further afield.

The two Bronze Age barrows (burial mound) ring-ditches lay on a flat shoulder of chalk, below the hill later occupied by the Iron Age settlement and on the edge of the eastern slope of the Nailbourne Valley.

Barrow one — the eastern-most of the two — was also the smallest with a diameter of 45 feet. The internal area of the barrow was carefully examined for pits or post-holes but there were no traces of any primary burials or features.

This is not unusual. Many Bronze Age mounds were never built as cemeteries or grave-mounds, rather possibly like our churches, acting as focal points for their religion.

This barrow was later cut by a field boundary ditch containing Iron Age pottery and probably related to the hilltop Iron Age settlement.

Barrow two was a different matter. It was larger, with a diameter of 60 feet. It had also been used as a cemetery. It contained 10 primary cremations, roughly laid out on an area six to seven feet within the ditch edge. Five cremations were in pots and five in pits. The latter five were probably placed in skin bags before deposition.

Unfortunately, all the cremations in pots had been damaged by ploughing, so none was recovered complete. However, all had been inverted before being placed to fit tightly into their respective pits. The pots

Several of the pots were decorated with a cordon or applied band of clay, which had been jabbed with a finger-nail or tip. Three of the cremation pots had holes pierced just below the rim, so skin lids could be tied on before the pots were inverted and placed in their pits.

The sequence of events might have been like this:

As a result of a battle or an illness it was found necessary to cremate 10 people — some children. A circle for the ditch was marked out on the ground and possibly the ditch dug first.

Then the burials were placed within the ditch circle and a low mound, probably of flint capped with chalk, raised over them.

A little later five more cremations were buried, two in pots, in a group near to the barrow. Much later still, when the barrow mounds had weathered into the ditches and probably all grassed over, a hearth was made in the lee of barrow two — pottery at the same level in both barrows was Iron Age in type.

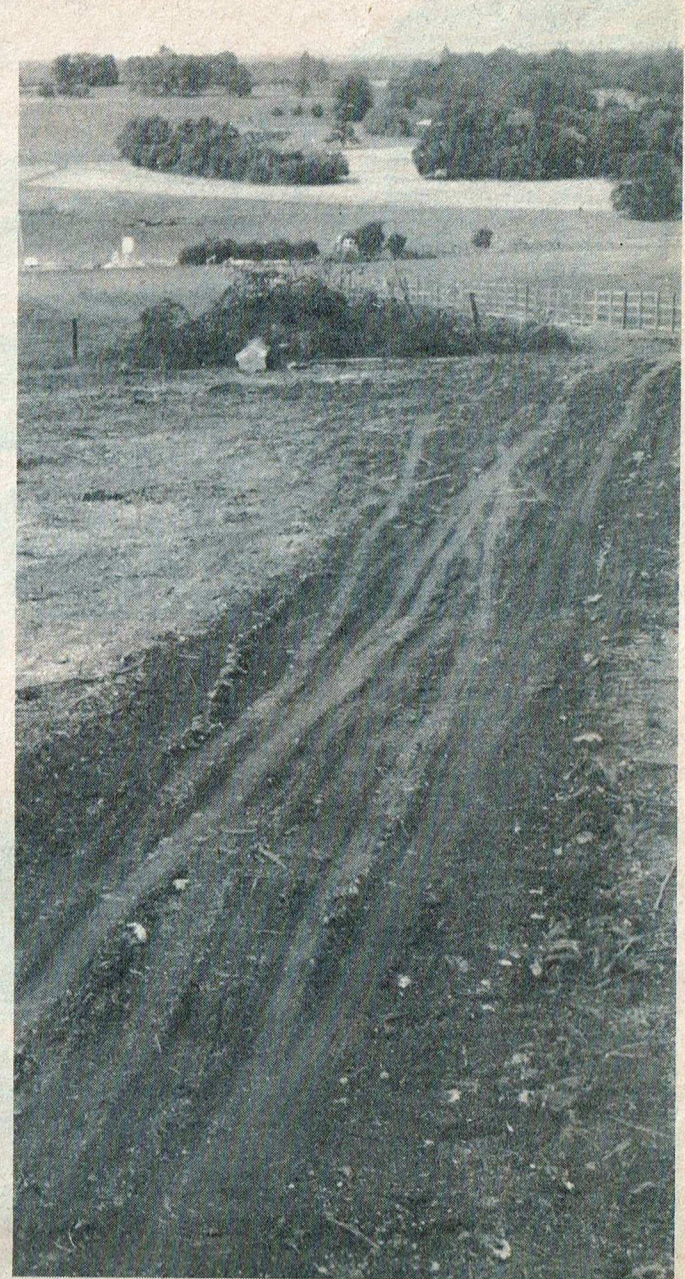
Both barrow ditches contained in their bottom sill flecks of charcoal, which suggests both barrows were built at the same time and that the cremation fires were nearby.

One point remains which does not immediately appear of archaeological value, but I consider worth recording. During excavation of two of the cremations, the pits were enlarged to facilitate lifting of the pots.

In each case, encircling the pit bases were tight-laid flints — their arrangement following the curve of the pit and appearing very intentional. But their position was such that they would not have been *visible originally*, either from the surface or during the original digging of the pits.

Justifiably we rationalise and say "Just a coincidence — lots of flints in the chalk anyway." But the coincidence remains.

Finally, samples of carbon were taken from the burial deposits and are now awaiting Carbon-14 dating. Non-scientific date estimates for this phase of the Bronze Age are always tricky, but a date for the



A view of the countryside in September, 1974. Nigel Macpherson-Grant in his article details some of the finds from

Mapping a road on the drawing board *Beware of bombs said the farmer*



Kent County Council's resident engineer, Mr J. M. Vince.

Designers have many considerations to bear in mind when planning a road. For the motorist, Bridge by-pass may be nothing more than another stretch of highway, but for the designers it has meant hours studying the area and its needs.

They have had to look at the history of the route, from the time the Romans built a road from Dover to Canterbury and called it Watling Street. Today's traffic pounds along the same route, passing through a number of villages.

Bridge grew up along both sides of Watling Street and the older section is now designated a conservation area by Kent County Council. Over the years, the village suffered more and more because of the increase in traffic and the old road could no longer cope with today's cars and lorries.

Obviously, a by-pass was necessary and since this is a trunk road, it is the responsibility of the Department of the Environment as the highway authority, although Kent County Council, as agent, carries out the work.

However, there are hundreds of schemes like Bridge competing for a place in the department's national programme and for the available funds. This by-pass had to wait its turn and in January, 1967, there was a meeting between representatives of the department, the County Council and the old Bridge-Blean Rural District Council.

Before that meeting, the County Council had been pressing for an extension of the M2 from Brenley Corner direct to Dover. However, funds were not available for work on such a scale and it was decided that the only way of trying to cope with the problem would be a series of short by-passes around the villages, together with the dualling of existing roads between them.

Many preliminary investigations have to be made before the route and design of a by-pass are conceived, and the County

Council's resident engineer at Bridge, Mr J. M. Vince, says these included the geology and ground conditions of the district, a study of the residential patterns and general community environments, the impact of the route on agriculture and industry, an analysis of existing traffic conditions and a prediction of future traffic flow, the views of a number of bodies, the effects of land drainage, effects on bus routes, the use and supply of local materials, and an aerial survey of the likely route.

Alternative routes were studied, but it was finally decided to press ahead with this present plan. In November, 1972, a public exhibition was held in the village so that villagers could see the form the scheme was taking and make their views known to Mr Vince and his colleagues.

From that meeting came three modifications: a complete redesign of the link onto the A2 at the Bishopsbourne end; the profile of the embankment through Bifrons Park was lowered; and a proposal that lay-bys for the by-pass be in the

valley was dropped completely.

Mr Vince says that having researched as fully as they were able, they were then armed with facts which enabled them to decide how to route the by-pass. It was only then that detailed engineering work for the design could begin.

A feature of the project is the landscape treatment in Bifrons Park, where the road is 35ft above the Nailbourne Valley. It was feared that an embankment of this height might appear to wall off the valley and, to reduce its apparent height, the ground has been built up on either side of the new road so that it now appears to travel across the valley on a shallow embankment.

To the west, near Beksbourne Road, the reverse procedure has been adopted. Here, the cutting for the new road has been extended out into the valley by building up the ground to mask nearby houses from traffic noise from the by-pass.

Before these landscape works could be carried out, the existing topsoil and subsoil were stripped

off and stacked separately nearby. Surplus chalk and clay from the excavated cuttings along the route were deposited to re-shape the land and the soil was re-spread and seeded.

This land will soon be returned for grazing and, in this way, farming land taken for the by-pass has been kept to a minimum.

Looking at the project as a whole, Mr Vince says: "One of the essential requirements for a contract of this complexity and size is that it must provide accurate information in detail about all aspects of the scheme on which work is required to be carried out.

"In order to achieve this level of information, over 300 working drawings were produced, together with schedules about drainage works, ground classifications, land survey data, and last, but not least, a comprehensive bill of quantities.

"Without this information, a contractor cannot reasonably be expected to assimilate, price fairly, and subsequently plan his operations on such a project."

At a very early stage, the road builders came up against an unexpected hazard — bombs!

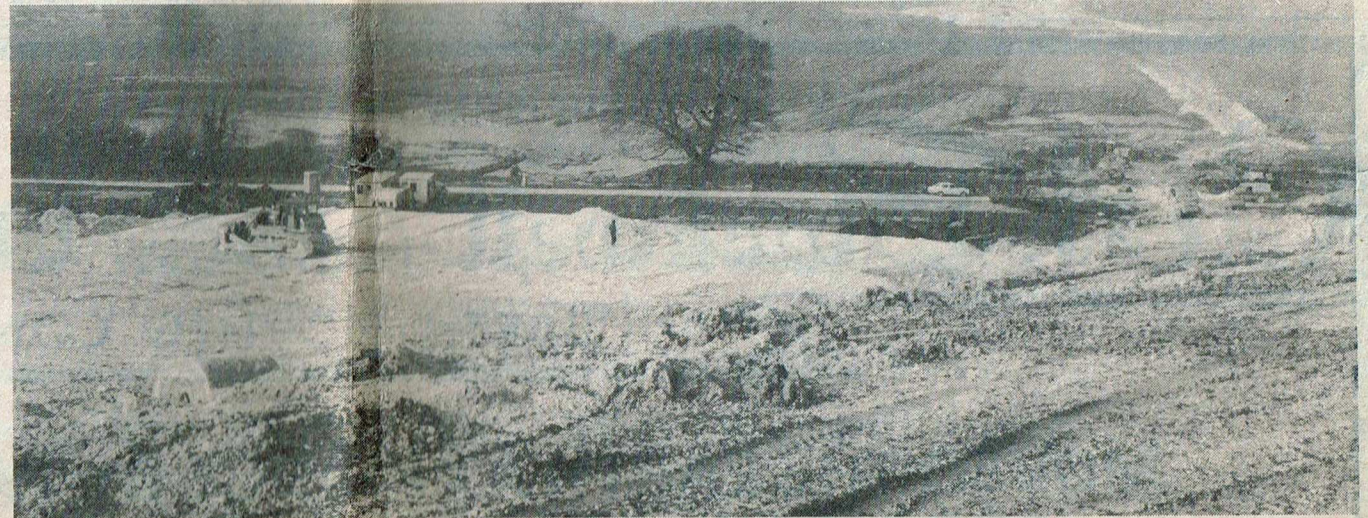
Mr John Vince, the site engineer, explains: "When I was first on the site at Bifrons Park, a farmer told me to watch out for the bombs. I thought he was joking, but he then went on to explain that it had been used as a training ground during the war, and he and fellow farmers occasionally ploughed up lumps of live hardware.

"We called the Army in straight away and they did a sweep lasting three weeks which turned up mines, a shell and a grenade. They were all exploded in the middle of a field.

"We had machines weighing up to 70 tons running around the area later, so I am very glad I had that chat with the farmer."



Mears' site agent, Mr P. G. Barrett.



The road beginning to take shape, as seen from Bifrons Park in February, 1975.



General foreman, Mr J. Reilly.

Choosing the right route

Three routes were considered at the preliminary report stage of the by-pass.

Each route was designed so as to ultimately join the proposed Canterbury by-pass to the north-west and the proposed dual carriageway on the existing A2 to the south-east. They were:

Route A (north-east of bridge): From Canterbury end the route swung eastwards in, cutting under Bekesbourne road, descending across Bifrons Park and the Nailbourne Valley and then rose, passing west of Highland Court to rejoin the existing A2 at Coldharbour Lane. This route was adopted.

Route B: This was an improvement of the existing alignment through the village.

Route C (south-west of bridge): From the Canterbury end this route swung west close to Renville Farm and descended into the Nailbourne Valley via Great Pett Farm and then rose through Bourne Park, rejoining the A2 at Frog Lane, Bishopsbourne.

Later, other southern routes were investigated in outline detail, including the suggested use of the old Canterbury to Colchester railway line.

It was found that all the southern routes had disadvantages because of route planning and access. They were also considered by the Kent County Council planning department to be more damaging to the local environment than the proposed northern route.

Congratulations on an early finish to Mears Construction Limited who built the A2 Bridge By-pass — from John Crowley — who surfaced it



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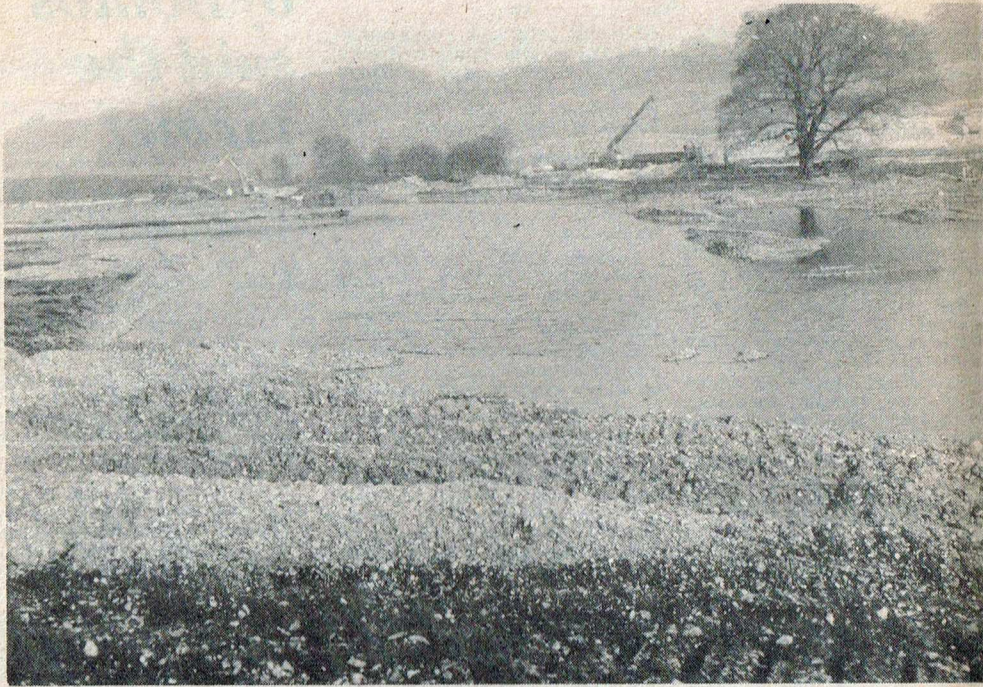
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TURNING THE PLANS INTO CONCRETE



The River Nailbourne in February, 1975.

Once plans were made for the by-pass, it was left to Kent County Council to find a firm to turn the drawings into concrete facts.

Mears Construction Company, a major division of the Mears Group, was awarded the contract. It took the firm eight weeks to prepare its tender. Once the tender documents had been received on April 8, 1974, the area was visited by the planners and estimators for a preliminary assessment and evaluation.

Meanwhile, a team of buyers and technical experts was already investigating the main requirements of the plans, and quotations were invited from specialist sub-contractors and suppliers for such operations as piling to foundations of bridges, earthworks, formwork and hot rolled asphalt surfacing.

Work continued with meetings between the technical and financial departments to discuss programming, planning, and methods of construction, together with a multitude of other problems and considerations.

Eventually, the basic construction plans were worked out, and the estimators got to

work on the bill of quantities. This was followed by top-level discussions in the company before the completed tender was submitted to Kent County Council.

On July 19, 1974, the contract was signed. Mears had been chosen to build the by-pass, and the site agent, Mr Peter Barrett, and his staff were appointed.

The next part of the plan was to find a suitable site for the offices for staff from Mears and the County Council. Eventually, it was decided to take 4½ acres of fields next to Coldharbour Lane and the A2 junction at the southern end of the by-pass.

Prefabricated buildings were quickly put up, and telephones, water and electricity laid on. While this work was going on, the specialist earthmoving contractor, C. A. Blackwell (Contracts) Ltd, appointed by Mears had moved in its heavy machinery in readiness to start excavation work.

More men and machinery were steadily arriving, and the temporary community was beginning to take shape. The momentum of work began building and Mears moved ahead with the planned pro-

gramme, in spite of difficulties, such as unexploded bombs and the unpredictable Nailbourne.

Between late autumn of 1974 and spring, 1975, twice the normal amount of rain fell and the Nailbourne began flowing above the ground for the first time this decade, causing extensive flooding of the works in the valley. It was evident that the valley would be waterlogged for some time, and wide-ranging revisions to the construction programme were necessary.

A major section of the earthworks re-started in the spring of 1975, and continued until the bulk of the excavation had been completed in February, 1976. Fortunately, the mild winter of 1975 and 76 helped recover some of the time lost during wet weather.

Apart from the earthworks, Mr Barrett and his men had to carry out extensive drainage operations to hold and channel the surface water from the carriageways, verges and batters.

The road was beginning to take shape and specialist equipment helped the work progress. The paving of the lean-mix concrete road-base started early in February, 1975, on the Dover-bound carriageway between Out Elmstead Lane and the B2065 junction.

Crowley, the specialist surfacing sub-contractors, imported supplies of the hot rolled asphalt from as far away as Maidstone and Whitstable and a total of about 24,000 tonnes of this paving material have been used in the surfacing of the road.

With the work now over, Mr Barrett looks back over the contract and says: "Mears Construction is pleased to have completed yet another major section of the nation's trunk road system with the completion of Bridge by-pass.

"Despite several adverse factors early in the contract period, the construction works have been notable for the teamwork and co-operation which has existed between the staff of Mears and the staff of Kent County Council. The beneficial result has contributed to the reduction of the contract period to enable the by-pass to be open two months ahead of programme and in advance of the main increase in the already heavy traffic flows caused by

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Building bridges

In any modern motorway or major trunk road scheme, a fair proportion of the money spent goes on structures. Bridge by-pass was no exception.

There are five structures — two underbridges, one over-bridge, one agricultural subway, and one accommodation bridge. All needed different techniques for their construction.

All are in concrete, with particular attention paid to the surface finishes.

On two of the bridges, Patricbourne Road underbridge and Bifrons Park agricultural subway, before construction of the actual bridge began it was necessary to "pile" the foundations.

Piles are, theoretically, underground stilts, and are required when the upper ground layer is incapable of carrying the loads of the bridge, and these loads have to be transmitted to more suitable strata.

Bekesbourne road overbridge will carry local traffic from Bridge to Littlebourne, Bekesbourne, etc.

Bifrons Park agricultural subway will provide access under the by-pass for farm traffic, while Patricbourne Road underbridge is the largest along this stretch of road.

Highland Court accommodation bridge has been built to replace two existing accesses to Highland Court Hospital and Highland Court Farm, and Coldharbour Lane underbridge is the only point of access onto the by-pass, other than that at either end of the road.

***... East Kent
news and
pictures
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