

The Kidderminster formation was worked in gravel pits and quarries in the high ground around Warley Park (3) but all that can be seen today are abundant quartzite pebbles in the ground surface on some of the paths or along the roadside in Harborne road. Numerous other quarries were located north of Thimblemill Brook and into Smethwick. The Kidderminster formation was an important local source of building sand and gravel. The pebbles were also crushed for road dressing.

The **Wildmoor** Formation, which outcrops from Lightwoods Park, Bearwood to Soho, was deposited as sand and silt in a broad, seasonally active river system with a general flow from the South to North as far as present day Cheshire. It contains virtually no pebbles and occasional mudstone bands probably representing wind blown dust accumulated under temporary lakes. Owing to an extensive cover of glacial material the Wildmoor sandstone was not worked locally but elsewhere it was an important source of sharp sand and where it contained clay particles and the quality was good enough it was also used as a moulding sand for the foundry industry.

Life in the deserts

For 80 million years Sandwell lay within or on the edge of a great tropical desert. It was hot, dry and windswept though not completely rainless and at times subject to seasonal flooding from torrents which swept sand and gravels from mountains near and far.



Scorching deserts

Some of the lake sediments have yielded fossils of small shellfish or primitive worms. Rare footprints of several different species of either amphibians or early reptiles have been preserved in the hardened mud but generally land animals had poor chances of fossilisation in such conditions. Plant fossils have been found in the Enville Formation near Hamstead. The skull of an amphibian was found in the Enville Formation near Kenilworth, indicating that despite the harsh conditions some animals managed to eke out an existence.

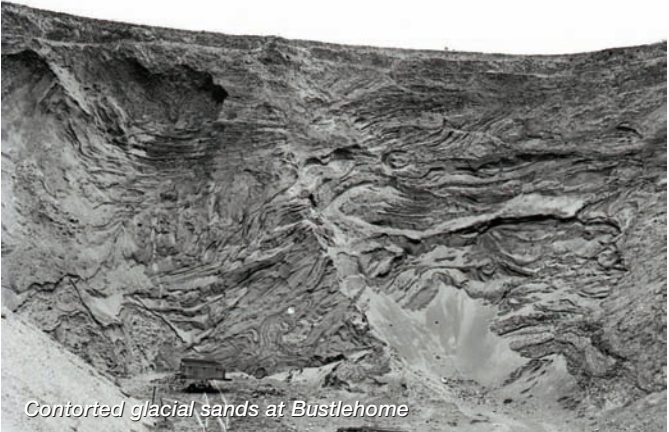
Fossil scorpions and a fragmentary fish fossil is known from the Wildmoor Formation near Bromsgrove.

Icy wastes

The larger part of Sandwell is blanketed by extensive superficial deposits (drift) of sands and gravels which overlie all the other older bedrock formations. Only the higher ground between Brandhall and Warley Woods and an isolated area either side of the motorway in Sandwell Park are largely drift free. Most of the Ice Age deposits are classified either as Till (boulder clay) or Glaciofluvial sands and gravels.

Till is mainly an unsorted mix of clay with pebbles and boulders transported by ice and left behind when the ice melts and retreats. The larger boulders are known as erratics because they occur randomly and in many cases have been transported hundreds of miles and have no relation to the local rock types.

Glaciofluvial sands and gravels were deposited by meltwater streams. Sometimes the streams would have been under or within



Contorted glacial sands at Bustlehome



Glacial gravels, Stone Cross

the ice sheets or glaciers. In other cases they are the product of outwash flooding during the seasonal thaw and form sheetlike spreads or river terrace deposits away from the ice front.

The Ice Age, technically known as the Quaternary period, was not just one episode of severe glacial climatic conditions but several oscillations from cold glacial to warm interglacial. Over the last 2.5 million years of the Quaternary period there have been at least 21 glacial stages interspersed by warmer conditions similar to or warmer than today.

Most of the Sandwell Ice Age deposits are believed to date from the Anglian stage (about 400,000 years ago) which, at its height, was the most severe glacial episode in Britain and 1km thick Ice sheets reached the outskirts of London.

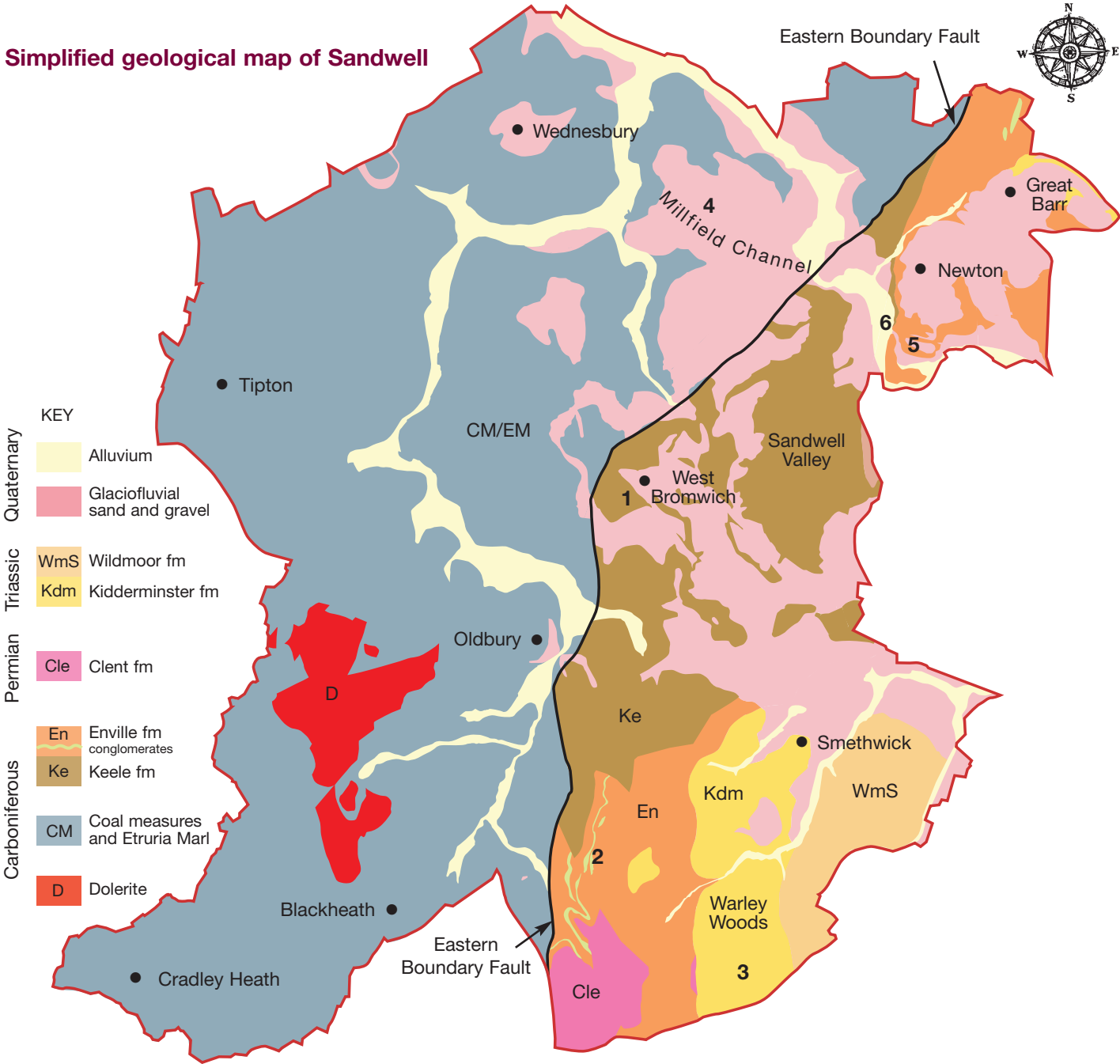
The Ice sheets of the last phase of glaciation, the Devensian stage, reached as far south as Wolverhampton. This stage peaked at around 20,000 years ago with the ice finally departing only 10,000 years ago. So some till and sands and gravels may be of this age.

From an economic standpoint the Glaciofluvial deposits have been the most important source locally for sand and gravel and may yet have future potential. In places the thickness of cover is considerable, filling up deep channels in the underlying bed rock.

The area around Smethwick and West Bromwich once had a great many small scale pits working the thick plateau of glaciofluvial sands and gravels which can sometimes be seen in the canal cuttings in Galton Valley.

The maximum thickness is found in the north of the borough where the workings were much more extensive. The sand pits at Stone Cross, Bustlehome (4) and Newton/Grove Vale (5) exploited the Millfield Channel (also known as the proto Tame channel) where the thickness of drift reached 19m. The deposits at Stone Cross and Bustlehome were remarkable for the contorted bedding, the folding of which is believed to have been caused by an overriding ice-sheet. Today only glimpses of the deposits can be seen around these pits, in the ground surface and around the roots of trees. Some exposures occur in the adjacent canal banks.

Simplified geological map of Sandwell



From suitable vantage points the breadth of the relatively flat bottomed valley of the river Tame can be appreciated. The river has in former times been considerably bigger and more powerful. River terrace deposits, believed to be associated with the later Devensian stage but probably derived from older glaciofluvial deposits, blanket the bottom of the valley. During the last 10,000 years alluvium has been accumulating along the floodplain consisting of about 2 metres of brown sandy clay and is well exposed on top of the terrace deposits in the west bank of the Tame near Tanhouse Avenue (6).

Life in the icy wastes

In areas south of the ice-sheets, tundra conditions existed supporting a fauna which included Mammoth, Woolly Rhinoceras, Musk Ox, Reindeer and Giant Elk. Conditions would have been similar to those in the northern parts of Canada or Russia today. Fossils, usually teeth, antlers or jaw bones, were often found by quarrymen in and around the Black Country.

Fossils from the warm interglacial episodes include Elephant and Hippopotamus, related to modern African species. At these times the English Channel had not fully formed and there was still a land bridge to the continent.

Human occupation of Britain occurred in phases linked to the advance and retreat of the ice sheets. Evidence from further afield suggests that, except in the most severe climatic conditions, Neanderthal peoples were living in the midlands during the Anglian stage and the following interglacial. They appear to have departed subsequently reappearing in the interglacial preceding the Devensian stage. About 35,000 years ago modern humans made their first appearance in southern England and not long afterwards the Neanderthals died out. The onset of severe glacial conditions, peaking around 20,000 years ago saw human departure again with Late Upper Palaeolithic people returning around 13,000 years ago.



Sandwell during the ice age



Dark brown alluvium on red sandy gravel, River Tame, Newton