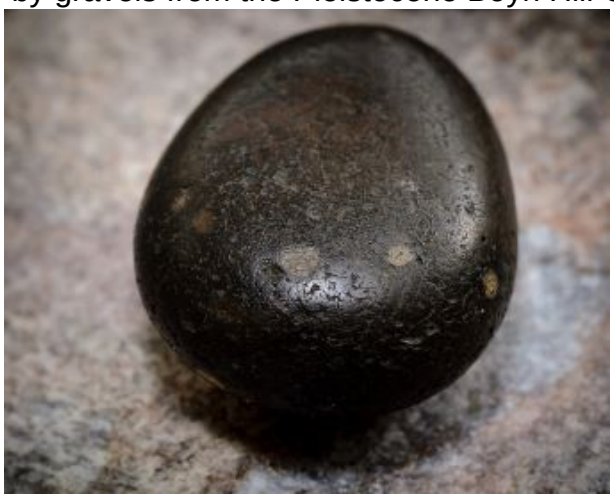
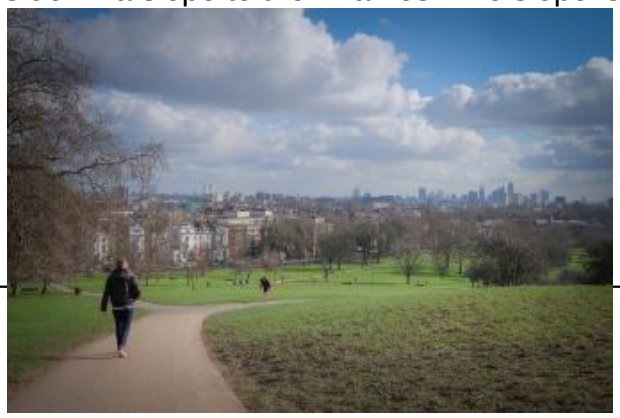

Richmond Hill (gravel terrace). Looking from the river back to Richmond Hill; London Clay capped off by gravels from the Pleistocene Boyn Hill Gravel Member dating from about 400,000 years ago.


Blackheath pebble. From the c.50 million year old Blackheath Beds (Harwich Formation) marine gravels.


Horsenden Hill. Horsenden Hill (85m) looking across the London Basin to the North Downs on the horizon. Horsenden Hill is London Clay capped by the Claygate Member and Dollis Hill Gravel. The Dollis Hill Gravel is a

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Pleistocene river terrace deposit Greenwich Park. Looking down from the Eocene Blackheath gravels down a slope to the Thames. The slope is


comprised of several distinct stratigraphic layers. Primrose Hill. Primrose Hill looking to the city. Primrose Hill (78m) is formed from 50 million year old Eocene London Clay bedrock, with no superficial deposits.


Below the man-made Pillow Mounds at High Beach, Epping Forest. The hill top is Quaternary Stanmore Gravel transported here by huge glacial rivers, sitting above much earlier Eocene Bagshot Sands laid down on the bed of a warm, shallow sea.

The geology of London, like the rest of Britain, is very complex. There are many different rock types visible at the surface, with some dating up to 145 million years ago, with many that are much more recent. The main bedrocks are Chalk and London Clay, with much of the surface geology made up of sands and gravels from the Eocene, till and gravel from glacial activity, and recent non-glacial deposits caused by wind or water action.

The London Basin area is formed from a layer of chalk accumulated on the bed of a warm sea

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in the Cretaceous period over 65 million years ago. Together with much of Southern Britain, at the same time the Alps were being formed around 15-20 million years ago, the area was folded to form a shallow basin (a syncline). This chalk basin is filled with other rock types, but it still surfaces today mainly in the Chiltern Hills to the north-west, and in the North Downs on the southern edge of the London area. At Westminster, it is 70 metres below ground. Chalk is porous, creating an artesian basin, and makes an alkaline soil.

Impermeable London Clay is also a sea-bed sediment, laid down 56-34 million years ago in the Eocene epoch. It lies on top of the chalk, and in some places is 150m thick. As with other clay soils, it is ‘heavy’ and not naturally good for agriculture, but two characteristics are very important for London: it is easy to be tunnelled and it makes very good bricks. Much of the London Underground system runs through tunnels dug into the London Clay, and this explains why there are few Underground lines south of the river: there is much less clay in this area. The classic yellow ‘London Stock’ brick is made from this clay, and can be seen in houses and buildings all over the capital.

Patches of other important sedimentary rocks that were laid down in the Paleogene period 65-25 million years ago include Thanet Sand, Woolwich Beds and Blackheath Beds associated with heathland and acid soils. The Bagshot Beds are old sands that lie above the clay, and create the hills of Harrow, Hampstead, Highgate and some of the heath around Esher.

The Ice Ages and more recent deposits

The Thames did not always follow its current path, but the action of great ice sheets eventually blocked the previous route through the Vale of St Albans and caused it to break through the chalk ridge at Goring from where it then scored its way through London, carrying much glacial debris with it. At the height of the last ice age as recently as 20,000 years ago, the ice sheet, extended down to present day Finchley, and deposited boulder clay around Finchley and much of London to the north. Repeated glacial and inter-glacial periods created much erosion and fluctuation in ice and river levels. The Thames alternately deposited and then cut through, gravel terraces formed. Much of central London is built on these terraces, with extensive flat areas connected by quite steep inclines being very evident: the roads that lead from the Embankment to the Strand are connecting one terrace with another. Oxford Street is on the edge of a river terrace and St Martin's Lane slopes into Trafalgar Square past the National Portrait Gallery, moving from one terrace to the next lower one. These terraces form many of the heathlands and acid grasslands of London, including the area around Heathrow. Gravel extraction for construction has resulted in many gravel pits.

In several areas, these river gravel deposits are topped with Brickearth, a fine grained wind-borne sediment, used in brick making. The area around Pall Mall is one such deposit.

The many river valleys have deposits of recent Alluvium, and and still being formed today in some areas. Other rivers such as the Westbourne (through Hyde Park) and the Tyburn (Regent’s Park) have been lost underground in recent centuries, but have left their trace in Alluvium deposits on the surface, culminating in this case a large expanse of Alluvium at Westminster.

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The soils formed from these surface geology produce a complex mosaic of different habitats, with their associated distinct flora and fauna.

Links

London Naturalist Geology Map: A map of the surface geology of the London Area, by Colin W. Plant (1994) (The London Naturalist 73: 215-220). Map here (as a .jpg file) or here (as a downloadable PDF version).

BGS Geology of Britain viewer

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