

Fig. 1. Left valve; indented by the pressure of contiguous granules, and subreniform.

Fig. 2. Fragment of a right valve; somewhat squeezed.

Fig. 3. Outline of a left valve; oblong.

Fig. 4. Profile of fig. 3.

Fig. 5. *a*, Outline of left valve, broadly oblong, *b*, end view.

Fig. 6. End-view of valve like fig. 3.

Fig. 7. *a*, Outline of left valve, broad oblong; *b*, profile. This valve is from Dr. Sauvage's specimen of the limestone.

Fig. 8. *a*, Outline of a carapace of united valves, right valve uppermost; broad-oblong; *b*, profile of the closed valves.

Fig. 9. *a*, Outline of left valve, short broad-oblong; *b*, profile.

THE NEW SECTIONS IN WESTCOMBE PARK, GREENWICH.

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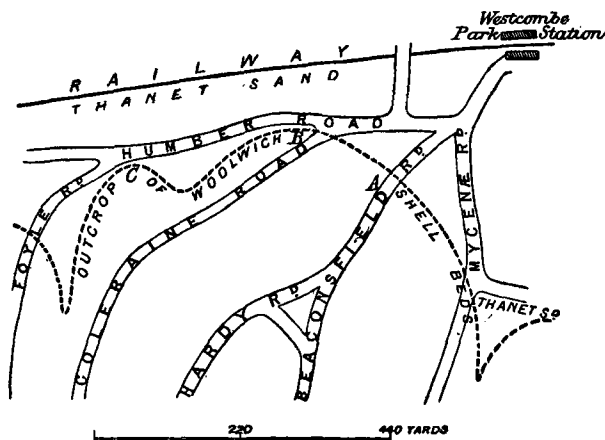
Westcombe Park lies about a quarter of a mile eastward of Greenwich Park, and between the Greenwich and Charlton Railway on the north and Westcombe Park Road on the south. The extension of the London and Greenwich Railway from its former terminus to Maze Hill, and thence to Charlton, has caused Westcombe Park to be cut up for building purposes. The Lower Tertiary escarpment (on the top of which Greenwich Observatory stands) almost coincides with the northern boundary of Westcombe Park, most of whose surface consists of the pebble beds of the Oldhaven or Blackheath series, which form a flat-topped plateau, as on Blackheath and in Greenwich Park. The roads recently cut from Westcombe Park Station across the brow or along the strike of the Tertiary escarpment afford the sections to be now described.

The well-known fault, with a downthrow to the north, which ranges nearly along the northern side of Greenwich Park, must cross the railway at, or slightly west of, Maze Hill Station, and keep a little north of the line thence to Westcombe Park. The exact position of this fault is hidden by the Thames Valley gravel, which forms the surface along the course of the railway west of Maze Hill. The cutting between Maze Hill and Westcombe Park Stations shows a thickness of 30ft. or more of Thanet Sand on its southern side, while the northern is either wholly in Valley Gravel, or Thanet Sand appears here and there beneath it towards the

bottom of the cutting. The orange-brown colour of the grave makes it easily distinguishable from the Thanet Sand, which is whitish or light grey.

Looking eastward from Westcombe Park Station, we see two chalkpits a few yards off close to the railway, and at a slightly lower level. South of these pits, and towards the mouth of the Blackheath Tunnel, Thanet Sand is conspicuous in the railway cutting on the other line. The sections to be visited all lie south of the railway, and may be taken in due order, proceeding from east to west. The first is in the Beaconsfield Road (A), which connects the railway station with Vanbrugh Park Road, East.

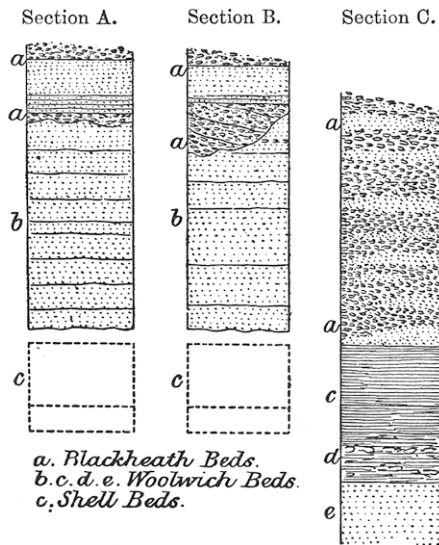
FIG. 1.—PLAN OF WESTCOMBE PARK.



Just below the cutting on the west side of this road the ground is wet, and many fragments of broken shells may be seen on the surface. This wetness marks the presence of the clayey shell beds of the Woolwich series, which hold up the water falling as rain on the sand and gravel above, and may be seen wherever the shell beds crop out along the hillside. Above the outcrop of the shell beds whitish sand, with thin partings of clay, appears. A thickness of 13ft. of this sand has been seen, though now only six or seven feet of it are visible (November, 1882). It is not quite certain that the whitish sand extends downwards as far as the top

of the shell beds, but there can hardly be room for more than two or three feet of any other stratum between them. On the whitish sand rests a pebble bed, varying in thickness from four inches to more than a foot, and containing many pebbles of large size. The line of junction between the sand and this pebble bed is a very wavy and uneven one. Above this thin pebble bed is a thickness of about 1ft. 2in. of thin laminations of clay and sand; then comes about 2ft. 2in. of orange-brown sand, and lastly pebbles, thickening southward, cap the hill.

FIG. 2.—SECTIONS IN WESTCOMBE PARK.



Scale, 8ft. to 1 inch.

Descending from the brow of the plateau towards the railway station, we turn to the left and proceed along Humber Road, which ranges nearly parallel to the railway. From the bridge over the railway on the right a good view of the Thanet Sand and Valley Gravel in the cutting may be obtained. A few yards further on Coleraine Road joins Humber Road on the left, and our next sections are in the bank dividing these two roads close to their point of junction (B). The outcrop of the shell beds is close to

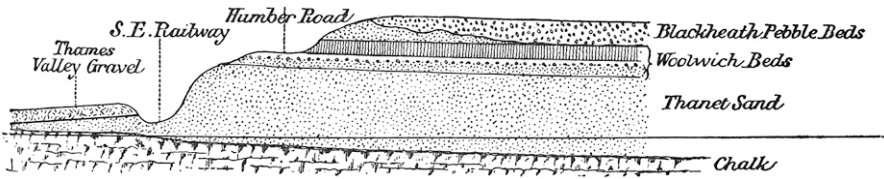
Humber Road on its southern (or left) side, where the wet ground and comminuted shells appear slightly above the level of the road. Above the shells light-coloured sand may be seen, but the junction is not visible. Here, however, as in Beaconsfield Road, there is no room for more than a (possible) foot or two of any other stratum between the light-coloured sand and the shell beds. Climbing higher, the pebble beds are seen crowning the hill, and their line of junction with the light-coloured sand appears to be an eroded one (see section B). From 2ft. to 2ft. 6in. of brown sand, with clayey partings towards the bottom, intervenes between the lowest pebble bed and that which caps the hilltop. The lowest pebble bed is seen to attain a thickness of 3ft. Two or three yards southwards pits showing 10ft. to 12ft. of the pebble beds have been dug.

Proceeding westward along the Humber Road, we see here and there signs of the presence of the shell beds on the left, and a few yards east of the junction with Foyle Road the pebble beds are seen—still on the left—resting directly on the shell beds (C), the light-coloured sand having disappeared. Here we have a clear section of the shell beds, which have a total thickness of about 5ft. 6in. Below the shell beds is a clayey stratum, 3ft. thick, containing soft calcareous matter and concretionary nodules of clay and ironstone. Beneath this is brownish sand, which is probably the bottom bed of the Woolwich series.

Sections in the pebble beds may also be seen a few yards due south of section C, and in Foyle Road, about midway between Humber and Westcombe Park roads.

A review of these three sections makes it evident that the light-coloured sand beneath the pebble beds in A and B belongs to the Woolwich series, and that here, as in so many other places, the Blackheath or Oldhaven Beds rest on an eroded surface of the Woolwich Beds. The Blackheath pebble beds themselves vary very much in the course of a few yards, as sections A and B testify. As to the shell beds, there are no means of determining their variations within the limits of Westcombe Park, but the one section there may be compared with those at Charlton on the one hand and Loampit Hill, Lewisham, on the other, as given by Mr. W. Whitaker on pp. 122 and 127 of "The Geology of the London Basin."

FIG. 3.—HORIZONTAL SECTION IN WESTCOMBE PARK.



The "general section" at Charlton, as given by Mr. Whitaker, much resembles that at Westcombe Park, each bed in the one section being represented by a similar bed in the other, and the only differences being slight variations in their respective thicknesses. The shell beds at Charlton vary from 6ft. to 8ft. in thickness, against 5ft. 6in. at Westcombe Park; but on turning from the "general section" at Charlton to that given on p. 123 as existing "between Charlton Church and the great chalkpit on the north" we find the shell beds thus composed:—

Charlton.

		FT.	IN.
Clay with shells	2 or more
Oyster bed	1 6
Clay shell bed	1 to 1ft. 6in.

At Westcombe Park the shell beds are thus—

		FT.	IN.
Clay with shells	4 0
Oyster bed (a trace)...	0 $\frac{1}{2}$
Clay with shells	1 6

And at Lewisham the general section gives—

		FT.	IN.
Clay shell bed	1 6
Oyster bed...	2 0
Clay shell bed	1 6

Thus, the composition of the shell beds at Westcombe Park differs in a marked way from that seen at both Charlton and Lewisham in two respects. The upper Cyrena (clay with shells) bed is more than twice as thick at Westcombe Park as it is at the two other places named, while the oyster bed has dwindled from

1ft. 6in. at Charlton and 2ft. at Lewisham to a mere trace of half an inch or thereabouts. The lower Cyrena bed remains, on the other hand, about equally thick in each locality.

As regards the beds above and below the shell beds, the resemblance between Charlton and Westcombe Park is not stronger than are the differences between each alike and Loampit Hill. Above the shell beds we find at Lewisham sand, with partings of clay, reaching a thickness of about 23ft., while the pebble beds, which attain a thickness of 30ft. to 40ft. at Westcombe Park and Charlton, are represented by a band of a few inches. On the other hand, at Westcombe Park and Charlton scarcely any pebbles are to be seen below the shell beds, while at Loampit Hill there are 18ft. or 20ft. of pebble beds and sand with pebbles between the shell beds and the top of the Thanet Sand.

The present time seems a specially suitable one for recording the nature of these Westcombe Park sections, inasmuch as they now tend to deteriorate rather than to develop. They have, in addition, never been visited by the Geologists' Association, though the excursion last year from Charlton to Loampit Hill brought a large party of its members almost to the southern border of Westcombe Park while on their way from Charlton to Blackheath.
