SOME HAMPSHIRE WELLS.

(Third Paper.)

By W. Whitaker, F.R.S.

Since the publication of the Geological Survey Mémoir on the Water Supply of Hampshire, in 1910, a goodly number of notes of wells in the County has accumulated, chiefly at the Geological Survey Office, and it seems good to make these public.

This can be done with advantage in the publications of the Hampshire Field Club, which, in years long past did a like service in printing two papers on the subject, before the Geological Survey could deal with it.

As one of the founders of the Club I am very pleased to find myself again taking part in its work, though contributing a decidedly unreadable paper.

By the kindness of the Director of the Survey, Dr. A. Strahan, its store of information has been placed at my disposal for this purpose, and all the more important sections, from a geologic point of view, are now given. Many others, which deal only with deep sections in the Chalk, or with other matter of interest only from the water point of view, have been left, for the present.

The accounts of the wells are arranged alphabetically, according to the names of the places (towns, villages, or parishes) where the wells were made, and a reference is given to the sheet of the new series of the Geologic or Ordnance Map in which the names of those places are to be found. Those wells in the Mainland are noticed first, and then those in the Isle of Wight. In all, therefore, 28 new records are now added to our store, besides a small addition to an old record.

For the valuable information given we have to thank those engineers and well-sinkers who so readily help in these matters, as is duly acknowledged under the various headings, and, of course, like Oliver Twist, one takes the chance of asking for more.

Most of the sections give useful information as to the character and thickness of the geologic formations passed through, sometimes in places where there was little precise knowledge before. The more notable ones are as follows :—

BRAMSHAW. Through a great thickness of Tertiary beds.

BURITON. Shows a great thickness of Gault, 348 feet.

CHILWORTH. Goes through Tertiary beds, from the Bagshot Sand, down into the Chalk.

EXTON. Passes through a great thickness of Chalk, although not starting at the top of the Upper Chalk and not reaching to the bottom of the Lower Chalk.

OTTERBOURNE. The second deepest boring in the County (1216 feet), being exceeded only by the one on Southampton Common. Shows a great thickness of Chalk.

KINGSCLERE. Two sections through the Tertiary beds, from the Bagshot Sand, down into the Chalk.

WOOLSTON. Starting in the Bracklesham Beds it passes through the whole of the older Tertiary beds down perhaps into the Middle Chalk. It is the third deepest boring (1100 feet) in Hants.

In the ISLE OF WIGHT three borings pass through a great thickness of Tertiary beds. East Cowes, through 722 feet; Newport, through 562; West Cowes, through 712.

As to the depth reached it will be seen that one boring goes to over 1200 and another to 1100 feet, two others (?) go to 700, and yet other two exceed 600, with a seventh considerably over 500 and an eighth of 500 feet.

Words in square brackets have been added, generally for the names of the geologic formations passed through.

ALTON.

Geologic Map 300, new series.

Highmead, 1¼ miles N. of the church. 1913.

587 feet above Ordnance Datum.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 7 inch tubes to 31 feet down. Rest-level of water 250 feet down. Pumped for 20 hours continuously at the rate of 500 gallons an hour.

Clay and Flints		22	
[Upper Chalk]	Marl	88	325 feet.
	Chalk ...	215	

Possibly Middle Chalk has been reached.

BEDHAMPTON.

Geologic Map 216, new series.

London Brighton and South Coast Railway. On the northern side of the line about a third of a mile W. of Havant Station. 1913.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 14 inch tubes to 21 feet, with 12 inch tubes to 107, and with 10 inch tubes to 259. Water rose to 2 feet above the ground.

	Thickness. feet.	Depth. feet.
[River Drift, 17 feet.]		
Ballast [gravel]	7	7
Running sand	10	17
[London Clay, 111 feet.]		
Blue clay, with rock from 40 to 41 feet ...	107	124
Green sand and pebbles [Basement-bed] ...	4	128
[Reading Beds, 115 feet.]		
Mottled clay	19	147
Brown clay	10	157
Sandstone	6	163
Blue clay	1	164
Sand	10	174
Rock and coal [lignite]	1	175
Mottled clay	9	184

	Thickness. ft	Depth. ft
[Reading Beds]—continued.		
Sandy clay	23	207
Sand	2	209
Mottled clay	6	215
Light-coloured clay	8	223
Blue clay	12	235
Black clay	2	237
Stones, rock, clay	6	243
[Upper.] Chalk and flints, with white sand from 336 to 337 feet	146	389

But said to be bored to 400.

If the suggested classification be correct, the Reading Beds are somewhat thicker than would have been expected.

BENTLEY.

Geologic Map 284, new series.

The Welshes. On N. side of Farnham road, ¼ mile westward of the village. 1914 ?

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 4½ inch tubes to 241 feet. Sand-screen at the bottom. Rest-level of water 92 feet down. Yield tested at 650 gallons an hour, with pump 150 feet down. Permanent suction 233 feet down.

[River]	Gravel	17	251 feet.
[Gault]	Blue clay	220	
[Folkestone Beds]	Sand...	14	

BOURNEMOUTH.

Geologic Map 329, new series.

87 Holdenhurst Road, E. side, between St. John's Wood Road and Cotland Road. Bournemouth Markets Ice and Cold Storage Co. 1911 ?

Communicated by F. W. OCKENDEN.

About 120 feet above Ordnance Datum.

Water-level 106 feet down. Yield 2200 gallons an hour, by air-lift test.

	Thickness. feet.	Depth. feet.
Soil	3	3
Gravel Ballast	12	15
[Bagshot Beds, 316 feet.]		
Hard white sand	6	21
Hard yellow sand	8	29
Coloured clay	9	38
Loamy sand with a little water	5	43
Hard yellow sand	20	63
Hard white sand	41	104
Greyish clay, with veins of sand	18	122
Yellow sand	5	127
Blue clay	1	128
Grey running sand	18	146
Hard dead dark grey sand	10	156
Running sand	4	160
Light-blue clay	6	166
Dead sand with thin beds of clay and wood	34	200
Grey dead sand	29	229
Brown clay	14	243
Grey sand with some running sand ...	15	258
Hard brown clay	56	314
Running sand	17	331

BRAMSHAW.

Geologic Map 315, new series.

Lower Barford Farm. Northward of the village. 1915.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 10 inch pipes to 150 feet, with 8 inch pipes to 300, with 6 inch pipes to 312, with Sand-screen to 336. Filled in below 336. Water-level 123 feet down. Yield tested at 100 gallons an hour, with suction 321 feet down.

[Bagshot Beds, 356 feet ?]	Thickness. feet.	Depth. feet.
Sand	60	60
Sandy clay	18	78
Sand	14	92

[Bagshot Beds]—continued.	Thickness. feet	Depth. feet
Clay	5	97
Sand	3	100
Hard sandstone	19	119
Soft green sand	36	155
Black pebbles	1	156
Black sand	12	168
Soft green sand	22	190
Red clay	12	302
Black sand	54	356
[London] Clay	254	610

The suggested classification seems doubtful, because of the great thickness assigned to the Bagshot Beds.

BRAMSHOTT.

Ordnance Map 301, new series. Geologic Map 8.

Shottermill. 483 feet above Ordnance Datum.

Made and communicated by Messrs. LE GRAND and SUTCLIFF.

Water-level 89 feet down. Yield 420 gallons an hour, lowering the water nearly 6 feet while testing.

[Hythe Beds.]	Thickness. feet.	Depth. feet.
Loam	1	1
Sand and sandstone	27	28
Sandstone	65	93
Fine blowing sand	6	99
Soft sandstone	8	107
Sandy clay	13	120

BURITON.

Geologic Map 316, new series.

Bolings Hill (Bolingehill) Farm, northward of the village. 1913.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 4½ inch tubes to 39 feet. Rest-level of water 58½ feet down. Pumped 28 hours at 450 gallons an hour. Water bad. The above refers to the boring down to 86 feet. It was continued and lined in 1914.

	Thickness. feet.	Depth. feet.
Upper Greensand	80	80
[Gault, 348 feet.]		
Blue clay	225	305
Blue and brown clay	110	415
Sandy clay	13	428
[Lower Greensand, 38 feet.]		
Sandstone	15	443
Sand	23	466

CHILWORTH.

Geologic Map 315, new series.

Chilworth Manor, 200 yards N.W. of Chilworth House. 1913.

200 feet (? a trifle more) above Ordnance Datum.

Bored and communicated by Messrs. LE GRAND and SUTCLIFF.

Rest-level of water 129 feet down.

	Thickness. feet.	Depth. feet.
[Bagshot Sand, 20½ feet.]		
Sand clay and ballast	6½	6½
Brown sand with thin bands of sandstone...	14	20½
[London Clay, 240½ feet.]		
Light-blue clay	7	27½
Brown loamy sand with slight moisture ...	33½	61
Blue sandy clay	38	99
Blue clay with *Turritella imbricataria* ...	27	126
Blue clay with one small clay-stone at 147 feet	28	154
Blue clay with clay-rock in bands	10	164
Blue sandy clay	16½	180½
Blue clay with occasional clay-stones ...	30½	211
Grey sandy clay, with rock from 224 to 224½	18	229
Mottled clay	3	232
Brown loamy sand	4	236
Brown sandy clay and bands of sand ...	9	245
Blue sandy clay (*Pectunculus brevirostris* at 260 feet)	16	261

	Thickness. feet	Depth. feet
[Reading Beds, 44 feet.]		
Mottled clay	41	302
Green clay and flints	3	305
[Upper Chalk, 195 feet.]		
Chalk and flints, with a hard band of chalk	179	484
Hard block chalk	6	490
Tough chalk and flints	10	500

EXTON ?

Geologic Map 300, new series (and 316).

Preshaw Park, W.N.W. of the village. 1914.

Made and communicated by Messrs. DUKE and OCKENDEN.

Well 180 feet, the rest bored. No. 2 well 177 feet; with 3 headings, 19, 22, and 24 feet long. Water-level 155 feet down. Yield 1100 gallons an hour.

G. BARROW interprets the section (partly from samples) as follows, and adds that an existing well was carried from 100 feet to 180, and 2000 gallons an hour got.

[Upper] Chalk with flints ...	354	658 feet.
Middle Chalk	151	
Lower Chalk	143	

FARNBOROUGH.

Ordnance Map 285, new series. Geologic Map 8.

Queen's Hotel.

Made and communicated by Messrs. LE GRAND and SUTCLIFF.

Water-level 42 feet down. No supply.

	Thickness. feet.	Depth. feet.
Made ground	1	1
[? Bracklesham Beds, 129 feet.]		
Loamy Sand. Water at 38 feet	99	100
,, ,, Yellow	11	111
,, ,, Mottled	$2\frac{1}{2}$	$113\frac{1}{2}$
,, ,, Green	$16\frac{1}{2}$	130

HAMBLEDON.

Geologic Map 316, new series.

Denmead. Mr. Gooden's. 1¼ miles S. of the village of Hambledon and a mile N.W. of Denmead. 1912.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 3 inch tubes to 98 feet down. Rest-level of water 66 feet down. Pumped for 9 hours at the rate of 300 gallons an hour.

[Reading Beds]	Clay	79	130 feet.
	Stones [? flint pebbles]	2	
[Upper Chalk]	Marl	3	
	Chalk and flints ...	46	

HAVANT.

Messrs. Steel's Tanyard, S. of West Street. (May be in the parish of Bedhampton.)

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined with 8 inch tubes to 48 feet down; Rest-level of water 3 feet down.

[River Gravel]	Ballast	19	200 feet.
[Upper Chalk]	Marl	9	
	Chalk and flints ...	172	

KINGSCLERE.

Geologic Maps 267 and 283, new series.

1. Beenham Court. Nearly 2 miles north of the town, and a little South of Headley. About 30 yards northward of the house. 1914.

Bored and communicated by Messrs. LE GRAND and SUTCLIFF.

320 feet above Ordnance Datum.

Water-level 65 feet down. Yield 1080 gallons an hour, lowering the head of water 1½ feet temporarily.

	Thickness. feet.	Depth. feet.
Gravel and loamy sand	3	3
[Bagshot Sand, 27 feet.]		
Loamy sand and water	15½	18½

	Thickness feet	Depth feet
[Bagshot Sand]—continued.		
Brown sand and water	4½	23
Grey sand and water	7	30
[London Clay, 193 feet.]		
Sandy clay	64	94
Blue clay with occasional clay-stones ...	84	178
Sandy clay with green seams	14	192
Green sand	1	193
Live brown sand	10	203
Light-coloured sandy clay	20	223
[Reading Beds, 45 feet.]		
Light-brown live sand	3	226
Dark mottled clay	29	255
Green sandy clay	2	257
Light-brown sand	2	259
Green sandy clay and shells	9	268
[Upper Chalk, 102 feet.]		
Soft sticky chalk and flints	4	272
Chalk, in hard and soft bands, and flints ...	11	283
Sticky chalk and flints	9	292
Chalk and flints	78	370

The division between the London Clay and the Reading Beds is doubtful.

2. Strattons. N.N.W. of the town. 1908 ?

Made by Messrs. TILLEY. Communicated by G. C. TILLEY.

Well 33 feet, the rest a six-inch boring. Water-level about 70 feet down.

	Thickness. feet.	Depth. feet.
Old well in gravel	33	33
[? Bagshot Beds or London Clay.]		
Sand and clay	41½	74½
Pebbles	½	75
Sand and clay	11½	86½
Pebbles	½	87

	Thickness. feet	Depth. feet
[London Clay.]		
Sand and clay	33	120
Blue clay	24½	144½
Clay-stone	½	145
Blue clay	38	183
Stone	½	183½
Blue clay	5½	189
Stone	¾	189¾
Sand and clay	34¼	224
Stone	½	224½
Coloured clay	1½	226
Stone	1	227
Coloured clay	10	237
Stone	1	238
Clay	4	242
Clay and sand	1	243
[? Basement bed] Stone	2	245
[Reading Beds, 54 feet.]		
Coloured [? Mottled] clay	10	255
Slate-coloured clay	4	259
Red and green clay	34	293
Dark clay	6	299
[Upper.] Chalk	50 (? 51)	300

OTTERBOURNE.

Geologic Map 299, new series (the village is in 315).

Southampton Waterworks. 121 feet above Ordnance Datum.

Information from E. C. Rodda, Waterworks Engineer to the Corporation.

Chalk ... ... about	1170	1216 feet.
Upper Greensand ... about	46	

Details cannot be given until the cores have been examined. The Chalk includes all the formation except a few feet at the top.

PLAITFORD.

Geologic Map 315, new series.

Melchet Court. Northward of the village. 1916.

Bored and communicated by Messrs. DUKE and OCKENDEN.

205 feet above Ordnance Datum.

Lined with 10 inch tubes to 220 feet. Water-level 61 feet down. Lowered to 65 when pumping at the rate of 750 gallons an hour. Most water found at 290 feet.

	Thickness. feet.	Depth. feet.
Yellow clay and stones	14	14
London Clay	132	146
Reading Beds	70	216
[Upper.] Chalk and flints	86	302

PORTSMOUTH.

Geologic Map 331, new series.

Ice and Cold Storage Co., Brunswick Street. 1916.

Bored and communicated by Messrs. DUKE and OCKENDEN.

Lined to 174 feet, and Sand-screen to 186. Water-level 13 feet down.

Clay	173	186 feet.
Sand	13	

RINGWOOD.

Geologic Map 314, new series.

Picket Post, nearly 3 miles a little N. of E. from the town.

Communicated by Dr. A. T. LONGWORTH.

Spring very quick. Obliged to put in several barrow-loads of clean stones to keep the sand down. Water-level 46 feet down.

[Plateau]	Gravel, with loam at bottom, about	30	51 feet.
[Barton]	Sand, very fine in the bottom part	21	

STEEP.

Geologic Map 300, new series.

Little Langleys. A little S.E. of the house, $1\frac{3}{4}$ miles N. of Petersfield Station.

About 350 feet above Ordnance Datum.

Communicated by H. FARQUHARSON. Bored (6 inches diameter) by Messrs. DUKE and OCKENDEN.

Water-level 114 feet down. Pumping at the rate of 500 gallons an hour lowered it to 154 feet; it rose afterwards to 108.

6 inch tubes to 285 feet; $4\frac{1}{2}$ inch tubes from 274 to 350; Sand-screen at the bottom.

	Thickness. feet.	Depth. feet.
Soil	$3\frac{1}{2}$	$3\frac{1}{2}$
[Upper Greensand, $23\frac{1}{2}$ feet.]		
Sand and clay	17	$20\frac{1}{2}$
Sandstone	$6\frac{1}{2}$	27
[Gault, 288 feet.]		
Gault, clay	281	308
Clay and sand	7	315
[Folkestone Beds, 46 feet.]		
Sand	15	330
Sand-rock and layers of clay	8	338
Sand	5	343
Sandy clay	5	348
Sand	12	360
Light-coloured sand	1	361

The water, though generally clear when first pumped, rapidly turns brown and turbid, owing to the deposition of iron-oxide (probably the carbonate is changed to oxide on exposure). The water is therefore unfit for use, unless allowed to settle and filtered. It was suggested to bore through to the Hythe Beds for better water.

Another account from Messrs. DUKE and OCKENDEN is as follows:—

Sandstone	25	361 feet.
Gault	290	
Sand	46	

WOODHAY, EAST.

Geologic Maps 267, 283, new series.

Woolton House.

Made and communicated by Messrs. A. WILLIAMS and Co.

Well 10 feet, the rest bored. Water rose to within 80 feet of the surface.

	Thickness.	Depth. feet.
[? Bagshot Sand, 53 feet.]		
Loamy sand	10	10
Hard grey sand	43	53
[London Clay, 71 feet.]		
Sandy clay	16	69
Blue clay	46	115
Hard green clay	9	124
[Reading Beds, 73 feet.]		
Mottled clay	17	141
Mottled clay and sand	21	162
Blue clay	16	178
Hard green sand	19	197
[Upper.] Chalk and flints	203	400

WOOLSTON.

Geologic Map 315, new series.

For Messrs. Thorneycroft. 1910.

15 feet above Ordnance Datum.

Made and communicated by Messrs. LE GRAND and SUTCLIFF.

Bore-hole of small diameter, decreasing to 2¼ inches from 700 feet down to the bottom. Water rose to 28½ feet above ground. Yield about 900 gallons an hour.

Water contains an excess of sodium-chloride; but after it had been allowed to run, as well as being pumped for some time, there was an appreciable decrease of this.

	Thickness. feet.	Depth. feet.
Made ground	6	6
[Bracklesham Beds, 180 feet.]		
Blue clay, the bottom 2 feet with shells ...	10	16
Sand	10	26

	Thickness. feet	Depth. eet
[Bracklesham Beds]—continued.		
Green sand and clay	18	44
Clay	21	65
Dark brown clayey sand & mundic (Pyrites)	20	85
Blue clay	2	87
Light-coloured sand (almost white) ...	17	104
Sandy clay	3	107
Sand with a little clay	18	125
Clay	26	151
Dark sand and clay	29	180
Hard clay	6	186
[Bagshot Sand, 47 feet.]		
Sand in hard bands	18	204
Sand in hard bands and sandy clay ...	29	233
[London Clay, 290 feet.]		
Sandy loam	25	258
Clay with pebbles and clay-stone	18	276
Brownish clay with shells (*Turritella imbricataria*, etc.), clay getting slightly blue at bottom. A few pebbles at 324 feet and at 350-351 feet	77	353
Brown clay and few shells	74	432
Sandy clay, with hard stone at 447 to 449	91	523
[Reading Beds, 97½ feet.]		
Mottled clay	24	547
Brown sandy clay	25	572
Blowing sand	16½	588½
Hard sand	6	594½
Blowing sand	6¾	601¼
Hard rock	2¾	604
Clayey sand	16	620
Green flints	½	620½
[Upper and ? Middle Chalk, 479½ feet.]		
Chalk and flints, sticky	154½	775
Chalk and flints	3	778
White sand	2	780

[Upper and ? Middle Chalk]—continued.	Thickness. feet	Depth. feet
Chalk and flints. Water overflowed at 795 feet and rose to 28½ above the surface ...	20	800
Chalk and flints, hard	20	820
Chalk and flints, sticky	59	879
Block chalk	101	980
Putty chalk	23	1003
Very hard block chalk	11	1014
Chalk, soft and sticky	4	1018
The like, with occasional hard bands ...	9	1027
Block chalk with soft seams	73	1100

COWES, EAST.

Geologic Map 330 and Isle of Wight Sheet, new series.

For the Cowes Urban District Council. 1911.

70 feet above Ordnance Datum.

Communicated by P. GRIFFITHS and from Messrs. DUKE and OCKENDEN (from specimens, W.W.).

This seems to be a fuller version of the account (to the depth of 330 feet) in the Hants Water Memoir, p. 242.

12 inch tubes to 153 feet, 10 inch to 334, 8 inch to 550, 7 inch to 656.

[Bembridge Beds, 118 feet.]	Thickness. feet.	Depth. feet.
Well, the rest bored	—	107
Sand (buff or pale, fine)	3	110
Limestone, hard and compact (sandy, tough, with shells)	8	118
[Osborne and Headon Beds, 326 feet.]		
Clay and shell, light-green (pale greenish-grey, sandy, with broken shells)	8	126
Hard stone (tough siliceous limestone) ...	1	127
Dark greenish clay and shell (brownish-grey clay, full of shells)	53	180
Brown and green clay (pale greenish-grey) with shells	12	192

[Osborne and Headon Beds]—continued.	Thickness. feet	Depth. feet
Sand-rock with flints and pebbles (pale grey clayey sand, fine; some clay)	10	202
Sand-rock (pale grey clay, some sandy, with broken shells)	6	208
Clay, shells and sand (hard grey clay, partly sandy)	6	214
Clay with shell (pale grey and greenish-grey)	58	272
Sandy clay (brownish-grey) and shells ...	15	287
Clay with peat (brownish-grey with peaty matter)	4	291
Clay, fine, and sandy (pale brownish-grey)	21	312
Clay (pale grey)	5	317
Sand with Mica (fine, light-grey, clayey) ...	37	354
Sand (fine light-grey sandy clay)	11	365
Sand, loose (pale brownish, with Mica) ...	5	370
Clay (brownish-grey)	5	375
Sand (grey sandy clay)	29	404
Sand, loose (grey, fine), with Mica... ...	30	434
Sand (grey sandy clay)	10	444
[Barton Sand, 51 feet.]		
Sand (loose fine grey, with marine shells) ...	12	456
Sand with shell (grey sandy clay and clayey sand)	40	496
Sand with shell (grey sandy clay) and stone	1	497
[Barton Clay.] All below (Dec., 1911) said to be blue clay	225	722

The division between the Headon Beds and the Barton Sand is made with doubt.

COWES, WEST.

Geologic Map 330 and Isle of Wight Sheet, new series.

Well and boring.

Communicated by P. GRIFFITHS from information from Mr. WEBSTER.

167 feet above Ordnance Datum.

	Thickness. feet.	ins.	Depth. feet.	ins.
[Drift.] Gravel	12	0	12	0
[Bembridge Beds, 116 feet 10 inches.]				
Yellow loamy clay (brick-earth)	1	9	13	9
Blue clay	9	3	23	0
Green clay (quantities of small shells) ...	4	0	27	0
Blue clay	19	0	46	0
Green clay	46	6	92	6
Green clay (layers of stone and shells) ...	6	6	99	0
Grey stone	1	6	100	6
Grey clay	2	0	102	6
Blue clay (thin layers of sand)	9	0	111	6
Yellow sand, a little water	4	0	115	6
Blueish-grey clay	6	0	121	6
Black, brown, and white clay (with boulders)	1	6	123	0
Stone, with shells and a little water (Bembridge Limestone?)	5	10	128	10
[Osborne and Headon Beds, 306 feet 2 inches.]				
Grey clay	4	2	133	0
Green and yellow mottled clay	6	6	139	6
Red and blue clay	1	3	140	9
Blue and yellow mottled clay	3	3	144	0
Red, brown and blue mottled clay ...	6	0	150	0
Green clay	2	0	152	0
Brown and blue clay	4	0	156	0
Greenish stone	0	3	156	3
Green and brown mottled clay	4	9	161	0
Dark brown clay and green shaley clay ...	2	4	163	4
Green and brown mottled clay	1	2	164	6
Green shaley clay, ...	0	4	164	10
Green clay with shell	5	10	170	8
Green and brown clay with shell ...	9	4	180	0
Brown and grey clay	2	9	182	9
Mottled clays	3	6	186	3

[Osborne and Headon Beds]—continued.	Thickness. feet	ins.	Depth. feet	ins.
Green and brown clay	1	3	187	6
Grey shaley clay (layers of fine sand) ...	4	3	191	9
Brown, blue and white clay	5	0	196	9
Grey clay (with thin seams of sand) ...	15	9	212	6
Green clay, a few shells	1	3	213	9
Light-green clay (layers of very fine sand)	5	9	219	6
Red and blue mottled clay	1	11	221	5
Green and brown clay (few shells) ...	3	1	224	6
Grey stone	0	10	225	4
Grey and green clay (boulders and shells)	6	8	232	0
Green and yellow mottled clay	0	6	232	6
Red, green and white mottled clay (with 4 inches of hard stone at base) ...	3	10	236	4
Red, green and brown mottled clay ...	3	2	239	6
Green clay	0	8	240	2
Very hard red and blue clay	2	0	242	2
Green stone	1	2	243	4
Light-brown clay	0	10	244	2
Grey stone with shells	1	3	245	5
Green clay with shells	3	0	248	5
Brown and blue mottled clay	2	10	251	3
Brown and green clay	3	9	255	0
Brown, green and white clay	1	3	256	3
Brown and green clay	2	9	259	0
Blue and brown mottled clay	5	6	264	6
Grey stone	1	3	265	9
Green clay (with large shells)	4	3	270	0
Green and brown mottled clay (with shells)	5	3	275	3
Green clay (with layers of clean white shells)	6	3	281	6
Green clay (with thin layers of sand and shells)	4	6	286	0
Green clay with sand	12	0	298	0
Hard green clay with sand	4	0	302	0

[Osborne and Headon Beds]—continued.	Thickness. feet	ins.	Depth. feet	ins.
Brown clay, very hard	1	0	303	0
Green clay (small shells)	1	0	304	0
Grey clay (shells in layers)	1	0	305	0
Green clay and shells	1	0	306	0
Brown clay-stone	1	6	307	6
Hard grey clay and sand	5	6	313	0
Soft sandstone	5	0	318	0
Sand, clay and shell	12	0	330	0
Sandstone	0	7	330	7
Blue clay	47	6	378	1
Clay and shells	5	0	383	1
Blue clay	19	0	402	1
Peat (lignite)	2	3	404	4
Clean sand	0	7	404	11
Blue clay	11	5	416	4
Clay and shells	6	9	423	1
Blue-clay	11	11	435	0
[? Barton Sand, 141 feet.]				
Sand	1	6	436	6
Stone	1	9	438	3
Sand	1	2	439	5
Blue clay	2	8	442	1
Sand and clay	40	9	482	10
Sandy clay	34	0	516	10
Sand and clay. Most water from here ...	45	2	562	0
Soft loamy sandstone	9	0	571	0
Green loamy sand	5	0	576	0
[? Barton Clay, 116 feet 7 inches.]				
Strong clay, green sand and shale ...	30	0	606	0
Sandstone	0	7	606	7
Strong clay and green sand	6	0	612	7
Green sandy shale (with veins of tough clay)	30	0	642	7
Shaley clay and sand with shells ...	34	0	676	7

[? Barton Clay]—continued.	Thickness. feet	ins.	Depth. feet	ins.
Tough clay	4	0	680	7
Tough clay with sandy veins	12	0	692	7

There seems to be some error in details, as the total depth is given as 712 feet.

NEWCHURCH.

Ryde Waterworks, Knighton.

New well (1910?) with headings 6 feet broad at 134-140 feet down. (Pipe-heading 32-38 feet down.)

Communicated by W. MATTHEWS.

[Lower Chalk, over 149 feet.]	Thickness. feet.	Depth. feet.
Loose broken grey chalk	40	40
Soft chalk, solid	$8\frac{3}{4}$	$48\frac{3}{4}$
Hard chalk, fissured	$8\frac{1}{4}$	57
Fissured chalk, soft at top, hard at bottom	$20\frac{1}{4}$	$77\frac{1}{4}$
Chalk marl	6	$83\frac{1}{4}$
Chalk	$4\frac{1}{2}$	$87\frac{3}{4}$
Marl	$3\frac{1}{4}$	91
Chalk marl and clay	$5\frac{1}{4}$	$96\frac{1}{4}$
Chalk marl with bands (? dipping 21° to N.)	$53\frac{1}{2}$	$149\frac{3}{4}$

NEWPORT.

1. Railway Works, N.E. of the Station (Central Railway). 1912.

Bored and communicated by Messrs. DUKE and OCKENDEN.

12 inch tubes to 175 feet; 10 inch from 169 to 203; 8 inch from 194 to 342; $5\frac{3}{4}$ inch from 362 to 422; $4\frac{1}{2}$ inch from 416 to 502; 3 inch, perforated at intervals, from 496 to 562.

Rest-level of water at the surface. Very slight overflow. Yield 1000 gallons an hour.

	Thickness. feet.	Depth. feet.
Made ground	2	2
[Hamstead Beds and Bembridge Beds, 202 feet.]		
Brown clay	19	21
Blue clay	129	150

[Hamstead and Bembridge Beds]—continued.	Thickness. feet	Depth. feet
Rock	½	150½
Green and blue clay	16½	167
Rock	½	167½
Blue clay	7½	175
White rock	3	178
Green clay	2	180
Brown and blue clay, with rock at 195 to 195½	19	199
White rock	5	204
[Osborne and Headon Beds, 358 feet.]		
Green and brown clay	11	215
Red, brown and blue clay	20	235
Soft rock	2	237
Red and blue clay	14	251
Hard blue clay	53	304
Red, blue and yellow clay	21	325
Sandy blue clay	11	336
Hard blue clay	6	342
Hard white rock	3	345
Red and blue clay	30	375
Soft rock	1	376
Blue clay, with rock at 405½ to 406½ ...	36	412
Rock	1	413
Green clay	9½	422½
Hard rock	2½	425
Soft rock with shells	1	426
Hard rock	1	427
Dark blue clay	3	430
Brown and blue clay	10	440
Hard blue clay	22	462
Blue sandy clay	19	481
Yellow clay	21	502
Brown and blue clay	11	513
Sandy clay	8	521

[Osborne and Headon Beds]—continued.	Thickness. feet	Depth feet
Black clay	9	530
Hard blue clay	5	535
Rock and sandy clay	13	548
Hard blue clay	5	553
Brown and blue clay	9	562

2. West Medina Cement Works.

A newer boring, made and communicated by Messrs. LE GRAND and SUTCLIFF.

Less details than in the Hants Water Memoir, pp. 159, 160, and to less depth (406 feet).

20 feet above Ordnance Datum.

Water-level 31 feet down. Yield about 1200 gallons an hour.

VENTNOR.

Electricity Works, Newport Road. 1899.

Communicated by A. E. MAYES.

[Upper Greensand, 109 feet.]	Thickness. feet.	Depth. feet.
Freestone and sandstone	11	11
Rag	1½	12½
Sandstone	21½	34
Rag	2	36
Sandstone, a little water at bottom ...	32	68
Rag	1	69
Dark grey sandstone	11	80
Brown sandstone	1½	81½
Dark grey sandstone, sparse water-bearing. Water rose over 22 feet	7	88½
Gault	6½	95
Dark grey sandstone, good water-bearing. Water rose 25 feet	14	109

Blue Gault.

YARMOUTH.

Close to Fort Victoria. ? 1914 or 1913.
Communicated by Messrs. MEIK.
Made by Messrs. LE GRAND and SUTCLIFF.
Words in parenthesis by H. A. ALLEN from specimens.
Classification by C. REID.
35 feet above Ordnance Datum.

[Headon Beds, 254 feet ?]	Thickness. feet.	Depth. feet.
Hard mottled clay and shells	6	6
Grey sandy clay	2½	8½
Light-coloured mottled clay	5½	14
Light-coloured sandy clay	3	17
Mottled clay (red)	4½	21½
Stiff blue clay	14½	36
Mottled clay (red)	6	42
Mottled blue clay (green to 60 feet, then red-mottled)	23	65
Clay-stone (with shells)	½	65½
Blue clay	10	75½
Hard blue clay and shells	8	83½
Blue clay and shells	6½	90
Soft sandy clay	1	91
Blue clay	6½	97½
Hard light-blue clay and shells, with clay-stone from 103¼ to 104 feet	12½	110
Dark sand (grey)	6	116
Hard sandy blue clay (green)	16	132
Dark clayey sand	3	135
Dark sand	7	142
Dark sandy clay	10	152
Hard light-blue clay, sandy, with shells ...	6	158
Light-blue sandy clay	4	162
Hard coloured sandstone	½	162½
Hard coloured clay (brown-mottled) ...	4½	167
Hard coloured sandy clay	3½	170½

	Thickness. feet	Depth. feet
[Headon Beds]—continued.		
Light-blue sandy clay	9½	180
Hard light-blue clay	19	199
Hard coloured clay (greenish-yellow) ...	6	205
Black clay	2	207
Hard blue clay	1	208
Hard light-blue clay	2	210
Black clay (carbonaceous)	2	212
Hard light-blue clay (green)	14½	226½
Sand (grey)	3	229½
Black clay (2 feet very carbonaceous) ...	4	233½
Hard blue clay	1½	235
Hard light-blue clay	13½	248½
Light-blue clay (green)	3½	252
Black clay (carbonaceous)	2	254
[Becton Bunny Clay. Perhaps this was meant to go upward to 229½ feet.]		
Blue clay (stiff, nearly black) about ...	5	259