

also before the latter date that Vestland entered into relations with the West Germanic civilisation on the east coast of the North Sea, and the Anglo-Saxon on its west coast.

Burials without cremation first occurred in the northern countries during the Roman period, and with a broadening of culture the funeral furniture grew more elaborate and diverse. These changes, entering Vestland later than other parts of Scandinavia, affected also the cremation burials, and in the Folk-wandering period (400-800 A.D.) the two kinds tended to fuse. Thus both methods occur in a grave-mound with three graves at Byrkje in Voss (Fig. 1). One of these graves, that of a

the mounds, and a tendency to uniformity of style throughout the whole of the north.

Usually in the Viking period there was a funeral pyre on a flat surface, below which the grave was dug and afterwards filled in with large stones, while its position might be marked by one or more gravestones (Fig. 2). The older orientation of head to north was often departed from. This last change and the increased simplicity may betoken Christian customs, if not actually Christian faith. But the halls of the mighty were still homes of heathen worship; their bodies lay when dead with head true to the north of their fathers, and over them, as at Upsala, at Tune, or at Gunnarshaug, were piled the highest mounds with the richest store of goods and the hugest sacrifices known from all Scandinavia.

MIGRATIONS OF BIRDS.¹

THE volume before us is the seventh of the series of annual reports on migration which we owe to the industry of a committee of the British Ornithologists' Club, which has set itself the task of collecting evidence over a period of ten years, and thereafter of summarising the data thus obtained. The reports have increased progressively both in scope and bulk, and the one before us is a stout volume. It deals mainly with the migratory movements of birds visiting England and Wales for the purpose of nesting in the summer of 1911. Passage movements are also dealt with, and the autumn movements of 1910 as reported by light-houses and light-vessels. Summaries of the meteorological conditions are furnished for purposes of comparison.

As the drawing of conclusions is forbidden by the self-denying ordinance of the committee, the volume before us is to be regarded as a summation of facts, and as such it deserves all praise, for everything possible has been done to ensure clearness by condensation, tabulation, and the addition of diagrammatic tables. An immense amount of material has had to be classified and

arranged, and we think that the committee has chosen the best course in grouping its facts under the headings of species, although the initial chronological summary is perhaps the most interesting to the casual reader.

The spring migration commenced on March 10 and continued until May 29. During the latter half of April there were three distinct waves of

¹ Report on the Immigrations of Summer Residents in the Spring of 1911; also Notes on the Migratory Movements and Records received from Lighthouses and Light-vessels during the Autumn of 1910. By the Committee appointed by the British Ornithologists' Club. Published as vol. xxx. of the Bulletin of the British Ornithologists' Club. Edited by W. R. Ogilvie-Grant. Pp. 332+20 maps. (London: Witherby and Co., 1912.) Price 6s.

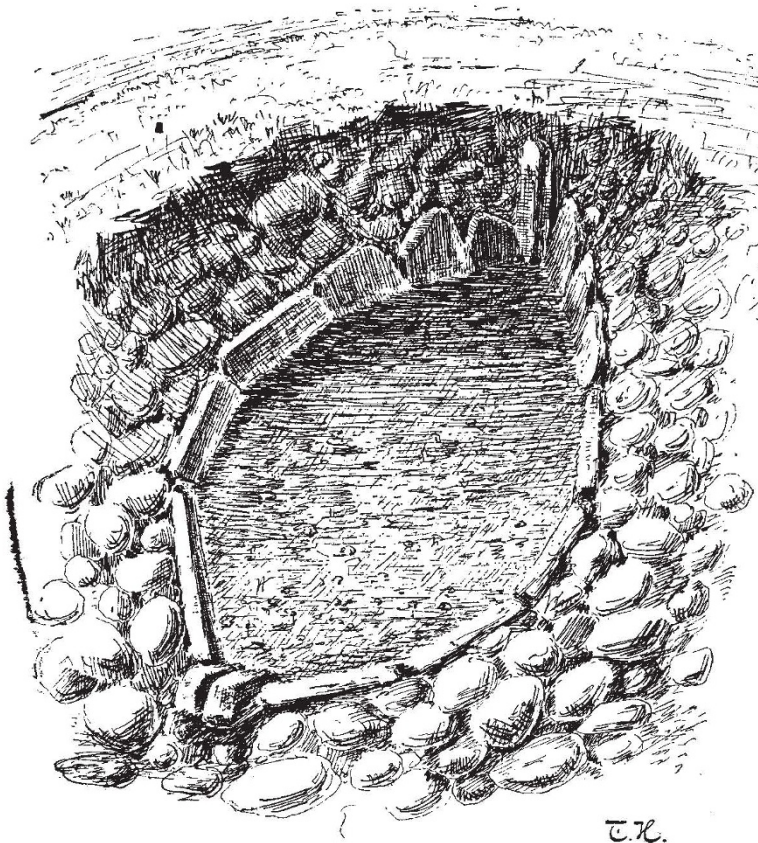


FIG. 2.—A boat-shaped arrangement of stones round a cremation-burial at Ølbør; a wooden boat also formed part of the pyre. (After T. Helliesen, Stavanger Mus. Aarsh., 1902). From "Vestlandske Graver fra Jernalderen." Bergens Museums Skrifter.

woman, is further noteworthy as the oldest boat burial in Norway, and approximately contemporary with the sixth-century boat grave in Suffolk. This mode of burial seems to have been the logical outcome of the Charon belief, evidences of which are found about this time in the form of ferry money. Rooting itself naturally and growing exuberantly in the mind of a seafaring folk, this rite bore its richest fruit in the subsequent Viking period, when the gross materialisation of a more primitive symbolism reached its climax. Towards that period there are also observed an increase in the number of weapons, a decrease in the size of

migration—on April 17 and 18, 23, 27 and 28—each of increasing intensity. There was another large influx on May 5. The immigrations of the willow-warbler (probably two races), which lasted from March 11 to May 6, and of the wheatear (two races), from March 19 to May 10, covered the longest periods among the species recorded; while those of the wood-warbler between April 16 and May 13 occupied the shortest time. Notice is drawn to the increasing and now extreme scarcity of the landrail in the south-east of England.

The records which are of most interest merely in themselves are perhaps those to be found in the section dealing with the autumn movements. The autumn of 1910 was noteworthy for the large influx of certain northern species, such as the wax-wing, northern bullfinch, mealy redpoll, and continental great tits. Jays were recorded as migrants to the south-east of England, and with them magpies (a flock of twenty), the latter being thus for the first time recorded as migrants to our shores. Great numbers of the little golden-crested wren were on the move round all our coasts between the end of August and mid-November.

LONDON WELLS.¹

HOW complex and how serious is the problem of maintaining a supply of water suitable to its needs few of the inhabitants of London have any conception. We turn the tap for our morning tub or to fill the kettle for tea and would be surprised and annoyed if the water did not readily flow. During the past few years, however, many large users of water have turned their attention to the provision of private supplies, and the number of wells has greatly increased. The early wells of the city and surrounding area were dug in the superficial gravels and Tertiary formations alone, for in those days they yielded a satisfactory supply without the need of descending further; gradually these shallow wells produced a smaller volume and a deteriorating quality of water, and had to be deepened and sunk into the Chalk.

According to the researches of Mr. A. S. Foord, there were no deep wells either in or near the city till at least the middle of the eighteenth century. It is probable that the difficulty of dealing with the mobile Thanet Sands delayed the introduction of deep wells until the art of overcoming the trouble had been perfected. The yield of many of the older wells was increased by putting a boring at the bottom. Now, the practice of sinking shafts is almost abandoned in favour of boring alone. These borings are lined in the upper portion and are carried as far as necessary into the Chalk. This change has been brought about by the fact that borings are cheaper than dug wells, and that the latter would have to be sunk at least 100 ft. before any water could be reached.

The height of the water level in London wells

¹ Memoir of the Geological Survey, England and Wales. Records of London Wells, by G. Barrow and L. J. Willis. (H.M. Stationery Office, 1913.) Price 4s. 6d.

has been sinking for a long time, but in recent years the fall has been increasingly rapid. This is most clearly brought out in the memoir before us by maps showing the contours of the underground water-surface and by the data supplied with many of the well records. The lowering of the water-level, if continued at the present rate, must seriously affect all wells in the London area, not only as regards quantity, but also quite possibly with respect to quality also. Mr. Barrow has great faith in a remedy for this evil, one which has already proved effective in the hands of Mr. W. B. Bryan in maintaining the level in the waterworks district at Lea Bridge. He recommends that spare water should be conserved in reservoirs in suitable districts and poured as required into dumb wells sunk into the Thanet sand, whence it would permeate into the Chalk; in the introduction to the memoir he brings forward a good deal of evidence in support of this method.

The influence of the Tertiary cover on the quality of the water drawn from the Chalk is remarkable. Water taken from the Chalk beyond the Tertiary outcrop carries a preponderance of lime salts; that from the Chalk beneath the Tertiary is much poorer in lime, which the sodium salts have greatly increased. This change is usually attributed to the influence of the Thanet sand. Dr. Thresh's valuable experiments on the effects of this sand are briefly discussed; but this is a subject of great complexity and requires further study. The work on soils carried out by various agronomic surveys, and that of Cushman and others on the influences of colloids in clays, should have some bearing on the problem.

The well records in this volume are very numerous, and many are published for the first time. They should prove of the utmost value gathered together in this form. Only by complete and accurate records and their careful correlation with geological conditions can an outlook be obtained on the state of the underground water as a whole. If the recording of all borings for water in the United Kingdom were made compulsory, much unnecessary waste would be avoided.

THE LISTER MEMORIAL FUND.

WE are informed that the contributions recently made to the Lister Memorial Fund include the following: Clothworkers' Company, 100l.; Grocers' Company, 52l. 10s.; Ironmongers' Company, 25l.; Mercers' Company, 105l.; Merchant Taylors' Company, 262l. 10s.; Skinners' Company, 105l.; Society of Apothecaries, 52l. 10s.; Corporation of the City of Glasgow, 52l. 10s.; Royal College of Physicians, 21l.; Royal College of Surgeons, 52l. 10s.; Royal Dublin Society, 50l.; Royal Horticultural Society, 52l. 10s.; the Royal Society, 50l.; Harveian Society, 10l. 10s.; Pharmaceutical Society, 10l. 10s.; Physiological Society, 10l. 10s.; Royal Microscopical Society, 5l. 5s.; Royal Sanitary Institute, 5l. 5s.; the