

State, or private bodies in return for considerable grants of money to cover the costs involved, thus often strengthening the holdings of the university library in subjects where it was weak. Mr. Collison went so far as to suggest that this strong link between commerce, industry and the university helps informally to direct research material to the most appropriate library. He also pointed out that in the United States the membership of most university libraries is almost unrestricted, provided a serious purpose is proved, and special libraries have little hesitation in approaching university libraries for help and for the loan of books, reciprocating by admitting readers recommended by the universities.

On the national scale the wise guidance of the Library of Congress can be seen in all aspects. The work of this Library in co-ordinating the efforts of all types of libraries is invaluable: its bibliographical aids were evident in every research library, and in return it does not hesitate to call on libraries with specialist knowledge to assist in the preparation of catalogue cards, bibliographies, etc., of specialist material. Besides the Farmington Plan, which has been revised so that the coverage of subjects is reduced to a much smaller number of libraries, while government publications are now included, there is the war-time scheme of the Library of Congress for obtaining for research libraries books and periodicals published in enemy countries and a similar scheme for Russian material. The National Union Catalogue contains entries for about fifteen million items in research libraries of all types, and inter-library book exchange is helped by extraordinarily low postage-rates. An important development has been the establishment of the Association of Research Libraries, comprising some forty leading libraries in the United States, and the considerable amount of informal co-operation between university and special libraries can be extended formally and informally without major alterations in the policy of either type of library. There is now contemplated the transfer to a regional library created for the purpose of extra-local responsibilities which local research libraries more and more find themselves bearing.

EXCAVATIONS AT MARGIDUNUM

IN his latest report¹, Dr. Felix Oswald continues the story of his work at Margidunum with an account of the area in the southern half of the site extending from the *Via Quintana* to the Counterscarp. This includes the site of the southern rampart with various pits and wells, and the first four outer ditches, as well as the smaller outer ditches V and VI which outline a paved patrol path for sentries placed along the Counterscarp. The Insula containing the Commandant's House, described in an earlier account in this series², lies immediately to the north of these features, on the other side of the *Via Quintana*.

The present report is chiefly concerned with the pottery and other objects found, the material being illustrated by a series of plates, each accompanied by a description of the individual items. The rest of the text is devoted to further description and discussion; but unfortunately this is marred by several unlucky misprints, for example, on p. 6, Plate IX in the second paragraph should read Plate VII, and XIII on p. 8 should always be replaced by a XII. The earliest finds, those dating from the mid-first

century A.D., come from ditch 5 beside the *Via Quintana*, and ditches 9, 10 and Z. As well as some unusual Terra Sigillata, they include interesting examples of butt beakers, rusticated and green glazed wares, and storage jars. Of slightly later date is a grey urn with a pronounced cordon below the neck with four *appliqué* hares seated upon it, an attractive discovery found in the lower levels of one of the stone-lined wells. Iron ore and slag came from some of the pits in the area demarcated by ditch 10, and these were obviously used for smelting; they were straight-sided and resemble pits used for similar purposes in parts of Africa. Another pit, near the junction of ditches 9 and 10 this time, contained the skeletons of six large dogs, probably injured in wild boar hunts in the nearby forest.

Towards the end of the first century, ditch 10 seems to have been used as a foundation trench for one wall of a building, identified as a stable after the excavation of pits in this area containing horse dung (still fresh), yellow straw, twigs and other stable litter, preserved from decomposition by a sealing layer of clay. The later history of the site is represented by some second-century pottery from the outer ditches, and the contents of the third century well already described in an earlier publication³. Pottery of the third and fourth centuries was also found in outer ditch III, while outer ditch I was partly obliterated by a late fourth-century wall.

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¹ Excavation of a Traverse of Margidunum. By Dr. Felix Oswald. Pp. 47+19 plates. (University of Nottingham, 1952.) 7s. 6d.

² Oswald, F., "The Commandant's House at Margidunum" (1948).

³ *J. Roman Studies*, 16, 36 (1926).

AEROPLANE OBSERVATIONS OF HOMING PIGEONS

THE homing of domestic pigeons and the migrations of wild birds are often considered as comparable cases of natural navigation. In both types of long-distance flight it is difficult to discover adequate guiding cues that lie within the sensitivity range of the birds' sense organs.

Direct observation from aeroplanes has recently thrown some light on the actual routes which wild birds use in finding their way home to their nests after being artificially transported to a distance. Herring gulls and gannets were observed to make exploratory flights in many directions, flights which covered a wide area surrounding the release point and which probably brought the birds, in time, within sight of familiar landmarks. It therefore seemed desirable to apply to pigeons the same technique of aeroplane observation which had been developed for use with wild birds, and this has been done by Donald Griffin (*Bull. Mus. Comp. Zool.*, 107, No. 8; December 1952).

Fifteen observation flights over distances up to a hundred miles disclosed several cases in which the birds appeared to be relying upon exploration or topographic landmarks. In other instances there was a definite tendency for the pigeons to head in the approximate direction of home, even when flying over what was almost certainly unfamiliar territory. Despite the fact that no final conclusions can be drawn from the results of these observations, the homing behaviour of these pigeons is of interest in view of the scarcity of precise, adequately controlled