

Proc. Univ., Bristol Speleol. Soc., 1981, 16 (1), 59-61

## RADIOLOCATION IN G. B. CAVE, CHARTERHOUSE-ON-MENDIP, SOMERSET

by

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### ABSTRACT

The position of four underground points in G. B. Cave, Charterhouse-on-Mendip, Somerset (ST 476.562), in relation to the surface was checked by radiolocation. The horizontal differences, as well as the differences in depth, between the points marked on the survey and those determined by radiolocation, were less than 5 metres.

### INTRODUCTION

Radiolocation or magnetic induction is an increasingly favoured technique to check the position of underground chambers, in relation to the surface (Glover, 1975). The method is based on reception on the surface of a signal transmitted by an underground alternating magnetic field. By achieving a null point the exact position on the surface, directly above the transmitter can be established and its depth can be calculated. This has been shown to provide a useful check on doubtful cave surveys (Clark, 1978).

Although the original survey of G. B. Cave was carried out with the use of a theodolite for the Gorge, and compass, tape and clinometer for the remainder (Crickmay and Bendall, 1949-1950), the possibility of a loop misclosure in a narrow long side passage may not be discarded completely. The Ladder Dig extensions were surveyed with compass, tape and clinometer to B.C.R.A. Grade 5 (Ellis, 1975 and 1976). A revised map of the complete cave was published by the U.B.S.S. in 1969, which can be assumed to have Grade 5d (Savage, 1969).

### DESCRIPTION

The extensions of White Passage each end in a small chamber, with a roof that consists of cemented boulders. Yet, although the two chambers are spaced at approximately the same distance as two shallow depressions on the surface, the chambers are not directly underneath or down-dip of these depressions. A similar situation exists at the highest point of Rhumba Alley.

In the underground Gorge there is no indication of the existence of the Great Swallet, a collapse doline (Bögli, 1978) of which the floor is only some 40m. above the roof of the Gorge.

This apparent lack of relation of the underground cave system to the surface topography made us decide to carry out a radiolocation at several points in the cave system. The following sites were checked: the junction of the extensions of White Passage, White Passage next to the junction with

Rift Chamber, Main Chamber just above the pitch and Great Chamber on top of the boulder ruckle.

## RESULTS

The lateral position of the four check points turned out to be very accurate (Table 5). The three highest points were accurate to within two metres, but this accuracy could not be claimed for Great Chamber, due to difficulties in deciding where exactly the underground position in Great Chamber was. This point turned out to be accurate to within five metres. A depth measurement for the site in the Main Chamber was not carried out, due to lack of time. The other three measurements show an increasing error with depth, but the errors fall within the instrumental error that Glover (1975) quotes as  $\pm 5$  m. (Table 5).

TABLE 5

Site	Depth below entrance (256 m AOD)		Displacement of underground checkpoint in relation to survey, 1969	
	1)	2)	East-West	North-South
White Passage extension	36	35	2m East	0
White Passage junction with Rift Chamber	59.4	55	0	0
Main Chamber	91.4	—	0	2m North
Great Chamber	97.5	92.5	$\pm 5$ m	$\pm 5$ m

1) Data from 1969 survey. Figures converted from feet into metres.

2) Measured by radiolocation in metres.

## CONCLUSION

The positions of the four points that we checked in G. B. Cave agree very well with the positions indicated on the survey.

## ACKNOWLEDGEMENTS

We would like to thank the University of Bristol Spelaeological Society for access to G. B. Cave, and Bristol Waterworks and Mr. Saunders for permission to carry out research on their land. Underground help was given by Janet Cooper, John Hanwell, Chris Mackintosh, Bob Peat and Geoff Riding, while Jim Hanwell gave valuable support on the surface. We would also like to thank John Crickmay for his criticism of the first draft of this paper. This project was carried out while one of the authors (H. F.) was supported by Philips-van-der-Willigenfonds, The Netherlands.

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