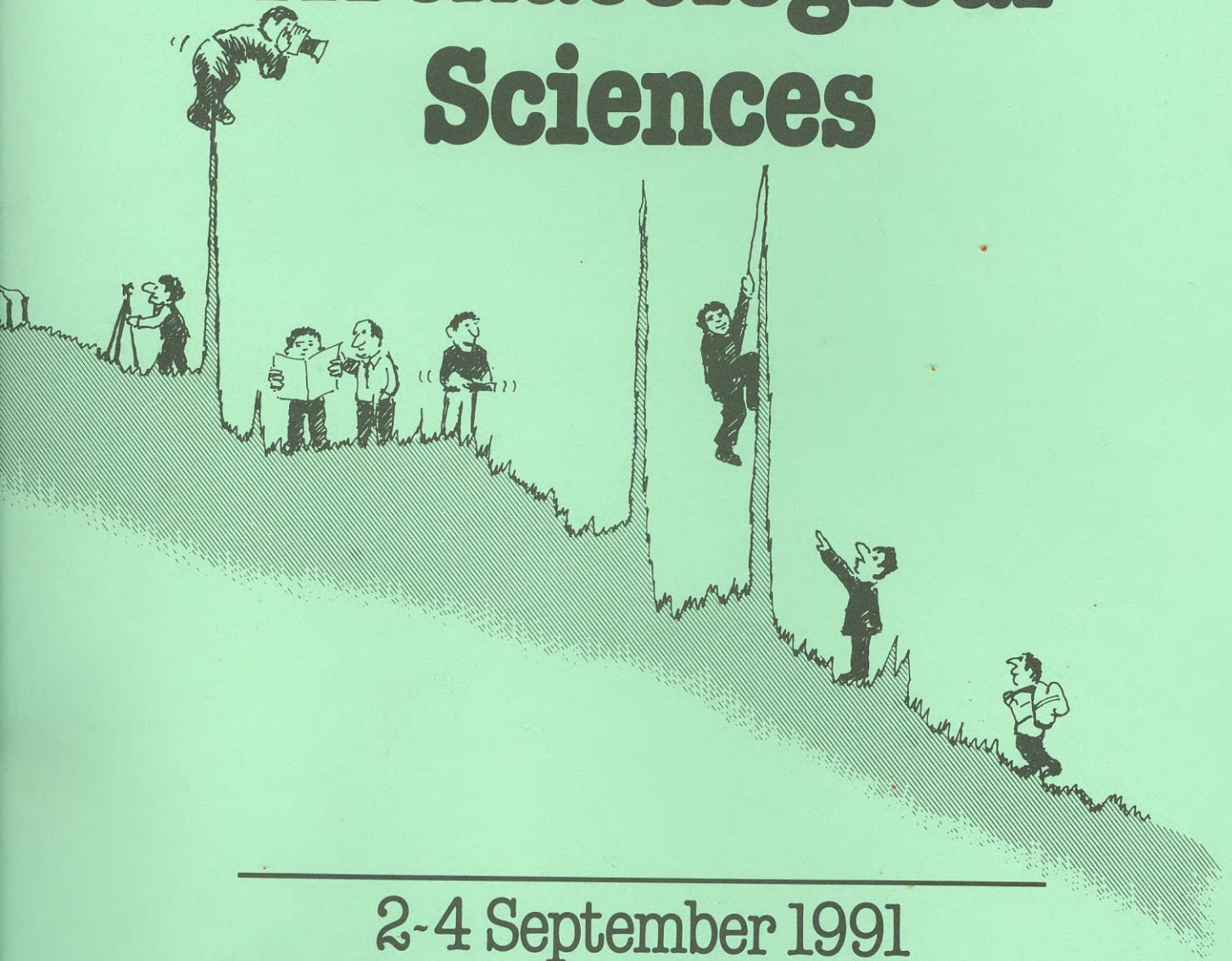


UNIVERSITY  
OF

YORK

A Conference on  
**Archaeological  
Sciences**



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2-4 September 1991

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at the University of York

Abstracts

## The Newstead Project: Geophysical Survey in a Regional Research Context

Oral Presentation

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With the establishment of reliable, well-designed instrumentation, direct logging of data and efficient processing software, geophysical survey of large areas is now viable, introducing the concept of utilizing the technique for upgrading site information on a regional basis.

The Newstead Project is a five-year research programme, drawing on a wide range of archaeological techniques, to study the settlement and environment of a 25sq.km area of the upper Tweed valley. One of the principal aims is to study the response of the native population to the transient Roman military presence in the area. The region had, prior to the inception of the project, a large body of settlement evidence, but many sites were known from aerial photography alone, their dating and character remaining in question. In much the same way, the Roman fort complex at Newstead, at the centre of the study area (although excavated intensively by James Curie in the first decade of this century), has failed to provide evidence for the usage of the palimpsest of large annexe areas around the fort, and the nature and dating of the fort phases is still not beyond doubt. The size of the fort complex (a minimum of thirty hectares) and the large number of native sites which required more detailed study, made large-scale geophysics an obvious choice to meet the challenge efficiently. It was therefore included in the research design from the outset, to be used at both a regional and site level, as well as interactively with excavations. With over thirty-five hectares of survey in the first two seasons, it is likely to become the U.K.'s largest regional geophysical survey programme and, importantly, one integrated with flexibility within a major research project.

This paper will present a detailed view of the philosophy of geophysical survey in the research design, the implementation, and the results so far. Field techniques, hardware and processing software will be outlined, together with detailed case studies demonstrating the success of an integrated approach, both in bridging the gap between aerial photography and excavation, and in aiding the excavation process. Even though survey is mainly resistivity and magnetometry, routinely used in concert, new research areas have been brought to light as a result. Radar has also been employed in an assessment exercise.

*The Newstead Project is under the direction of Dr Rick Jones of the University of Bradford; the major funding body is the National Museums of Scotland.*

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### Monday 2nd September

#### 10:00 - 11 00 Registration & Coffee: Derwent College

11:00 Start of Conference: C/AIOI

11:00 *Welcome and Introduction*  
J.E. Szymanski

11:10 Opening Paper (Chair: J.E. Szymanski)

11:10 *Archaeological Sciences: Into the 90s*  
A.M. Pollard

11:50 Archaeological Site Location. Presentation and Analysis: C/AIOI

11:50 *Opening Paper: Archaeological Imaging by Electrical Resistivity Tomography: A Progress Report*  
M. Noel, B. Xu and R. Walker

12:30 Discussion

#### 12:45 Lunch: Derwent College Dining Room

2:00 Evaluation (Chair: M. Noel)

2:00 *The Newstead Project: Geophysical Survey in a Regional Research Context*  
P.N. Cheetham

2:30 *The Analysis of Airborne and Satellite Remote Sensing Imagery for the Location of Archaeological Sites*  
J.M. Alsop and D. Greenbaum

2:50 *The Use of Ground Conductivity Surveys for the Rapid Evaluation of Archaeological Sites*  
J.M. Allsop and M.G. Raines

3:10 *The Simulated Annealing Approach for Archaeological Magnetic Data*  
J. Dittmer and J.E. Szymanski