One of Warwick's special houses for visiting research mathematicians.

Maths teaching degree at Warwick

By David Tall, lecturer in mathematics with special interests in education, Mathematics Institute, University of Warwick

The first three-year honours degree to include teacher training as an integral part is already in its first year at Warwick University. The course is only available in mathematics and is the result of long collaboration between the university and Coventry College of Education which will merge in 1977.

Plans were first begun as long ago as 1969. The situation in mathematics teaching was critical. The introduction of many "modern mathematics" projects meant that the school syllabus was in a state of flux and yet paradoxically there was a chronic shortage of qualified mathematics teachers. This led to fewer good mathematics students passing through university and an insufficient supply returning to school to teach. It was in this atmosphere that new methods of attracting well qualified mathematicians into teaching were considered.

On looking at various university syllabuses, it became startlingly obvious that some topics essential in school mathematics were not compulsory in every institution including, for example, computing and statistics. This could mean that the new school teacher could easily find himself teaching a subject that he had never studied at any level. On the other hand with the syllabus always liable to change the intending teacher also needed to be flexible and capable of dealing with new material.

A course to meet these needs was designed and submitted to the James Committee on teacher education in 1971. Further consultation followed with the Department of Education and Science and the course was approved in 1974. The first full intake is planned for autumn, 1975, but a number of students who entered the university in 1974 have already embarked on the course.

In view of the standard four years to produce a qualified mathematics teacher there needs to be very special qualities about an institution which plans to do the job in three. From its foundation Warwick has built up two exceptional qualities which make this course viable and even desirable. In the first place

it has always worked in close collaboration with the nearby Coventry College of Education. In terms of teacher education this provides a broad spectrum of abilities and interests from the high academic standards, on the the one hand, to sound educational theory coupled with down-to-earth practical experience on the other.

The second special factor is the nature of the Warwick mathematics department. From the outset the department recognized the wide diversity of applications in mathematics, from the science subjects through to economics, business studies, psychology, education and so on. These are so diverse that they could not be accommodated under one roof and the logical step was taken to place the pure mathematicians in the mathematics department and applied mathematicians in the department of their application.

All these subjects together with other departments provide courses which the Warwick mathematics students are free to combine with pure mathematics to plan their own degree structure (provided at least 50 per cent comes from the mathematics department itself). There are a number of joint degrees in which the other subject can be studied to a greater extent.

The mathematics/teaching degree simply fits into this structure as a joint degree, most of its courses being carefully selected from those already available together with some created specially for the purpose. In this way it is no different from any other Warwick degree involving mathematics. As such, a student who takes it and in the end decides against a teaching career will have a degree with similar currency to others when considering employment prospects. In one way, however, it is very different from other joint degrees, in that the expertise developed in the part of the course provided by the college is of sufficient quality to confer qualified teacher status.

On the academic side in mathematics, Warwick has consciously developed in a different manner from most institutions. It has its own mathematics research centre, to-

gether with six special houses on the campus specifically set aside for visiting research mathematicians. The centre attracts large numbers of visiting mathematicians from all over the world and this, in turn, generates an unusually high number of research students. This gives a large population of graduate mathematicians available to partake in university teaching and a far ranging supervision system to help the students achieve a mathematics degree of some depth and quality.

It is a combination of these factors which makes the mathematics teaching degree possible at Warwick. Indeed the system is so special, that the degree is only available in mathematics.

The new degree contains approximately one-third pure mathematics, one-third applied mathematics (including some computing and statistics) and one-third educational studies with teaching experience. It is basically a sandwich course, with the first and third years at the university and the middle year at the college, although students retain links with both institutions throughout. As part of the plan to utilize the time available to its best advantage, the students transfer to the college immediately following their first-year examinations to get experience with primary schoolchildren. By using the vacation for project work, the middle year at the college is extended to give an education content greater than the college's own postgraduate certificate.

In the third year the students return to the university for more academic mathematics. Meanwhile they keep in touch with school by teaching an afternoon a week with the same group of children throughout the year.

The qualified teacher status is assessed on a pass/fail basis on the satisfactory completion of scheduled teaching practice and associated work involved in preparation for teaching. Work in the first and third years, together with educational theory in the second year, contributes to the class of the honours degree by aggregating 10 per cent of the first year marks, 30 per cent of the second year and 60 per cent of the third.

Students wishing to take the course enter under the mathematics UCCA code and are free to indicate an interest in the UCCA forms. There is freedom of transfer during the first year (though students who indicated the course on their form will be given preference in the event of over subscription for transfer).

It is hoped that this new addition to the extensive variety of mathematics courses will help to attract talented and well-qualified mathematicians into the teaching profession.