

Teaching

1. At Cambridge, much of my teaching was within the dual College–University system. For Peterhouse and, as a Lecturer, for Trinity College, I taught the rudiments of pure mathematics to undergraduates. The courses covered were on real and complex analysis, linear algebra, probability, group theory, and to a lesser extent measure theory and ring theory. I also taught logic to undergraduates of all colleges. My lecturing, as distinct from my College teaching, was chiefly confined to Part III (a one-year post-graduate course preparatory to work for the Ph.D. degree) and to Graduate Courses, which are courses aimed at research students and members of the Faculty.

Courses, usually of 24 lectures, on topics in Set Theory and Logic given in Cambridge:

Year	<i>Part III</i>	<i>Graduate</i>
1969/70	Constructible sets	
1970/71	Boolean-valued models I	Boolean-valued models II
1971/72	Model Theory	Ultrafilters
1972/73	Constructible sets	Descriptive set theory
1973/74	Boolean-valued models I	Boolean valued models II
1974/75	Model Theory	
1975/76	Jensen's combinatorial principles	
1976/77	Scales, strategies and sharps	
1977/78		
1978/79		
1979/80	Constructible sets	
1980/81		
1981/82	Constructible sets	Iterated Ultrapowers
1982/83	Recursion Theory	
1983/84	Borel sets	Forcing
1984/85		
1985/86	Infinitary Games and Combinatorics	
1986/87	Introduction to set theory and forcing	Large cardinals and forcing
1987/88	Recursion Theory	
1988/89	Descriptive Set Theory	
1989/90		
1990/91	Large cardinals and determinacy	

Undergraduate logic courses: when I was a University Assistant Lecturer I gave the Part II course on Set Theory and Logic and initiated an 8-lecture course on Foundations for Freshmen, which I also gave in 1980-81.

Research students: I wholly or partly supervised the preparation of the dissertation of seven successful Cambridge Ph.D. candidates:

D.Guaspari (later, Vice-President of Odyssey Research Associates of Ithaca, N.Y.; retired)

A.Kanamori (now Professor of Mathematics at Boston University)

T. Forster (of DPMMS)

R. Seeley (now Adjunct Professor at McGill University in Montreal)

N. Tennant (now Professor of Philosophy at Ohio State University, Columbus),

J.Cummings (now Professor at Carnegie Mellon University, Pittsburgh),

D.Seetapun (later NSF Post-doctoral Fellow and Assistant Professor-elect at Cornell University, but then left academic life for merchant banking).

2. Elsewhere, I have given courses for graduates on topics in set theory and logic at:

- University of Wisconsin, Madison, 1968/69
- Monash University, Melbourne, 1969 (three weeks)
- Stefan Banach Centre, Warsaw, 1973 (three months)
- Technical University, Berlin 1980 (three months)
- Simon Fraser University, 1983 (four months)
- Sienna 1986 (six weeks)
- Berkeley 1991 (fourteen weeks)
- Warsaw 1991–2 (eight months)
- Bonn 1992–3 (three weeks)
- Caen 1992–3 (one month)
- Barcelona 1993–4 (eight months)
- Luminy September 1994: (five lectures on Δ_2^1 determinacy, to a specialist international audience)
- Barcelona 1994–5 (one elementary course, on admissibility, constructibility, and forcing, and one advanced, on the axiom of determinacy; each three months)
- Oxford, Hilary Term 1995 (graduate course on forcing and large cardinals, for general topologists)
- Barcelona, 1995–6 (advanced course on iteration trees)
- Bogotá, 1997–8 (course for advanced students on descriptive set theory, 4 months)
- Bogotá 1997–8 (research course on the axiom of determinacy, five months)
- Bogotá 1998–9 (course on the theory of recursion, four months)
- La Réunion 1998–9 (course on descriptive set theory, 36 hours)
- La Réunion 2001–2 (course on fundamental techniques of set theory, 72 hours)

3. Besides teaching logic, I have given courses for undergraduates in other areas of mathematics. Apart from the courses I gave as an Assistant Lecturer in Cambridge, I have taught courses in elementary linear algebra in Madison, real analysis at Simon Fraser and at Berkeley, and Lebesgue measure, again at Simon Fraser. In Bogotá I taught an undergraduate four-month course on Galois theory and related topics, in preparation for which I read three slim volumes on Galois Theory (by Artin, Garling, and Stewart respectively) and browsed widely in two other treatises on algebra (by Fraleigh and by Cameron).

4. In Réunion, the teaching load is standard for France; some variation is possible, but it typically means 76 hours of lectures during the year plus 78 hours of examples classes. The actual topics taught have varied slowly from year to year: besides teaching logic and set theory to the third and fourth years, I have taught linear and quadratic algebra to the second year, to the third year, commutative algebra and a little number theory, and to the fourth year courses on finite groups, Galois theory, operators in Banach spaces, and probability.

5. My teaching philosophy evolved during the twenty-year period that I was engaged in supervising undergraduates reading Mathematics at Cambridge and lecturing to Part III and graduate audiences on topics in logic; and I reached the view that the purpose of teaching is not, primarily, the transfer of information but the strengthening of minds.

I hoped to show my pupils that they have a mind which can be used to think about problems, and to teach them to approach unsolved problems courageously rather than timidly. How I did that, in supervisions, would vary from pupil to pupil. Generally I would tell them that they should not be frightened of talking nonsense, that being the intermediate stage between saying nothing at all and talking sense. On individual subjects I had various messages: for example, that linear algebra was an easy subject so long as the geometrical meaning was kept in mind, but impossible if the geometry disappeared.

In the lecture room, my style has, I believe, changed considerably from the formalist approach to which I felt committed in my early days in Cambridge. The pace and content of any particular lecture will depend on the size and ability of the audience and on their response to the lecture as it develops, as judged by the expression on their faces, by their questions, and by the feel of the lecture hall.

6. I have found it a refreshing experience to teach topics other than logic. Such opportunities were rare during my ten years of peregrination; invitations to the various universities and research centres have usually been based on my expertise in set theory, which has meant that I have not often had the chance, which I welcome, to teach other mathematical subjects.

A broadening experience in this regard was my six months' residence at Oberwolfach, which gave me the privilege of observing many groups of mathematicians, each week a different group working in a different area, and of discovering something of their aims and methods and of their varied perceptions of mathematics and of the place of their own discipline within mathematics.

Happily, my time in Réunion has brought many opportunities to expand my teaching repertoire.

7. My criticisms of Bourbaki: if the main thesis of my paper "Hilbert, Bourbaki and the scorning of logic" is correct, then there is considerable scope for developing plans for increasing the amount of logic teaching.

Those criticisms, in which I maintain that there are identifiable areas of mathematics not well served by Bourbaki's treatment, have also had some echo in the writings of economists such as Kumaraswamy Velupillai, who hold that these areas might be of service to mathematical economics. The possibility interests me as it is giving me the opportunity to develop my understanding of the rôle of logic outside mathematics.