

An Accidental Academic



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The front cover shows the Great Court of Trinity College, Cambridge and should be compared with the photographs on pages 9 and 68; the inside of the back cover shows the courtyard of University House at the Australian National University in Canberra.

Foreword

For the first 24 years of my life I had no intention of becoming an academic. Rather I expected to earn my living as an employee of some large company, such as the Iraq Petroleum Company that I joined in 1964 as a reservoir engineer. However, things panned out differently and I'm very happy that they did. I've made a career as a mathematical physicist, working on simple models of statistical mechanical systems, asking questions akin to "why does water boil", or "why does it freeze" - can we predict this just from the physical properties of one water molecule? I've been able to make some contributions to the subject.

In this I've been wonderfully supported by my wife Elizabeth, who put up with my wanting to "do my sums", when she would have liked to talk, and accompanied me on my various journeys to academic meetings. I thank her with all my heart.

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Chapter 1

The early years

I don't remember the event, but I was told that I was born on 8 February 1940 in Connaught Hospital in Walthamstow in north-east London. I was also told it was a somewhat traumatic arrival - I took my time to arrive, and when I did I wasn't breathing. The last problem was fixed by dunking me alternately into hot and cold water - a drastic but obviously effective solution. It wouldn't have helped that my head was a bit large - apparently when I was still quite young one child-care nurse gave me a little quiz to find out whether I was brainy or the opposite. Fortunately I passed the quiz.

I was christened Rodney James Baxter. My parents were Thomas James and Florence Amelia Baxter (Mum never liked the Amelia bit). They'd married in 1925, when they were 23 years old. Dad worked for the National Bank in Old Broad Street in the City of London, where he rose to become head of the department responsible for clearing cheques to and from other banks. In 1925 he was fairly junior and the bank would not have regarded him as earning enough to get married, so the bank was not told of the wedding. I was the youngest of the family: my sister Eileen was 14 years older than I, and my brother Dennis was 7 years older.

We lived in Galeborough Avenue in Highams Park, the part of Walthamstow close to the more salubrious Lon-

don suburb of Woodford Green, whose member of parliament was Winston Churchill. (Walthamstow was very much Labour). My first memory (which surprised Mum when I told her of it many years later) was of wearing a bright yellow one-piece suit as a very small boy. A later one was of coming back into the house from the Anderson bomb shelter in our garden to find the front door blown down and the windows in the front room blown in, with glass everywhere.

I also remember the street party round the corner in Montserrat Avenue to celebrate Victory in Europe Day in 1945. Everyone was cheerful, saying the war was over. This left me a bit puzzled - wasn't it usual for bombs to occasionally drop from the sky and leave craters where houses had been?

About then I would have started at Handsworth Avenue Infant's School. It was unusual in that the building was home to both the infants' school and the secondary modern school (no primary school in between). When I was beginning to master printed letters I often walked past a secondary classroom, where the blackboard was full of cursive writing, and wondered how I would ever be able to read these much more difficult letters.

When I was about seven I moved on to Selwyn Avenue Boys Primary School. We didn't have a car (nor did most of the boys' families), so I was not driven to and fro school - I and my class mates walked the half-mile to and fro each day. The bombs had stopped and it was a safer society than now. We were much more independent than modern children. During holidays and weekends we rode our bikes several miles on expeditions to Chingford and Epping Forest.

At the age of 11, I took two exams to determine at what level I would continue my schooling. One was the pri-

vate exam for Bancroft's School - a "public" (i.e. private) school in Woodford Green, founded by the Drapers' Company of the City of London in 1737. The exam had a large component of general knowledge, which was not my forte - one question was "who lives in the White House". There was a large house between Highams Park and Bancroft's, and indeed it was called "White House", but I didn't know who lived there, so one way and another I was doomed to fail that question. I've wondered since whether they would have accepted the answer if I had known the occupant of that house. (They should have done.) I failed the exam.

However, I also sat (as did all the schoolchildren) the public 11-plus exam. This was more of an intelligence test and I passed it, obtaining a government scholarship to Bancroft's, which was better financially than going there on the basis of the private exam.



Preparing to start school at Bancroft's

1.1 Bancroft's School

Bancroft's was then an all boys' school, with boarders and day boys (I was a day boy). There was none of the organised bullying one reads about happening at some major public schools, and virtually none by boys to younger boys - we tended to just ignore the boys in the years below us.

Even at primary school I had done well at arithmetic. I must have inherited an interest from my father, because he once taught me how to take square roots long-hand (a skill I've since forgotten). At Bancroft's I did well at mathematics, coping easily with algebra and geometry. I naturally veered towards the science subjects, but we all had to study a modern and an ancient language, so I chose French and Latin. I think the Latin master was a little put out when one term I topped the class in Latin - I suspect the classicists were all hard at work that term on their Greek!

By and large life at Bancroft's went smoothly, but occasionally there would be a master's cry of "Baxter!" and I'd be punished for some offence I hardly remembered committing!

In my mid-teens I started to acquire quite a social life. Quite often I went out in the evenings to youth clubs, which were organised by local churches and other groups, meeting in church halls or government schools. I joined a drama group and went with them once to the Theatre Royal in Stratford (East London, not the River Avon) to see a very early production (maybe a rehearsal) of Shelagh Delaney's "A Taste of Honey". After the show we went backstage and saw how professional actors worked.

The Headmaster of Bancroft's was Sydney Adams. He followed my career, for when I was elected in 1977 to the Australian Academy of Science I received a letter of con-

gratulation from him. Five years later, when I was elected to the Royal Society of London, I wrote to give him the good news, and was saddened to receive a letter from his wife saying that he had recently died.

My parents were not church-goers, but I started to go to church on Sundays. When I was about 14 I went to the United Free Church in Woodford Green, but quickly discovered a taste for ceremonial and moved on to the Church of England. This was fully catered for at Saint Barnabas Church in Snakes Lane, which advertised High Mass on Sunday mornings, and Solemn Evensong on Sunday evenings: lots of bells and smells. I became an altar server.

One master's responsibility was to guide the boys towards their future careers. When I was sixteen or so he took me aside and asked what I intended to do when I left school. I replied that I hadn't really thought about it, but would look for a job somewhere. He responded "we think you should go to Cambridge".

This was a real eye-opener for me. None of my family had gone to university and it just wasn't something I'd thought about. However, once I did I liked it. I'd seen Cambridge one school holiday and had loved it. The idea of actually being an undergraduate there was wonderful. I needed no convincing. On the other hand, without that word from the careers' master I may have never even thought of it. Teachers and parents do have a great responsibility to guide their charges, and alert them to their potential.

Mum and Dad did need a little persuading. They wrote to the advice columnist in the popular press Daily Mirror newspaper. He replied by mail that it would indeed be a good idea for me to get a Cambridge degree and suggested one in applied rather than pure mathematics, as that would

be more useful and more likely to lead to a good job. That is the way I went and is probably where I was best placed. Still, it did hurt a little to be dependent on advice from the Daily Mirror, and as it turned out I became an academic, where there are probably more jobs in pure mathematics than in applied.

I was very much the beneficiary of the educational reforms made by the post-war UK governments (presumably the Labour Government of 1945 to 1951 was particularly responsible). I paid no fees when I did go to Cambridge and received a maintenance grant that paid my board and lodging and gave me adequate pocket money during term time.

1.2 Cambridge, England

Late in 1957 I went up to Cambridge to sit the scholarship examination for Trinity College. I was assigned a room in college for two nights and had my first taste of a Cambridge winter: there was a jug and a basin of water in the room, and on the first morning I woke to find a crust of ice on the basin! The next night I worked out how to use the solid fuel stove.

Anyway, it seems my brain had not frozen, for I sat and passed the examination, qualifying as a college scholar.

In the autumn of 1958 I went to Cambridge as an undergraduate. We wore short undergraduate gowns to lectures, dinner in hall, and outside the colleges in the evenings. The Cambridge system was that one had a college tutor and a director of studies. The task of the former was to keep you on the straight and narrow, and admonish you if you committed some offence, such as coming in late (after 10pm) without prior permission. It was the director of studies who was responsible for your academic studies.

The actual academic tutorials were usually given by a post-graduate student, but the director of studies could give you tutorials himself, In my last year John Polkinghorne did just that. John was a regular attender at the College Chapel: a few years later he left mathematics and physics to become ordained in the Church of England, winning in 2002 the prestigious Templeton Prize for work at the interface of science and religion.

Being a college scholar meant that one skipped the first year of the curriculum, since it was assumed that you already knew the material. That may have been so if you'd come from Eton or Harrow, but I did have a problem with the mathematical subject known as analysis. Analysis is pure mathematics par excellence: everything has to be rigorously proved from first principles. For instance, Rolle's theorem is equivalent to saying that if one draws an unbroken line on a piece of paper, drawing steadily from left to right, but going up and down at will, and finishing at the same height as one started, then there are only three possibilities:

1. You've drawn a straight horizontal line,
2. At least one point on your line is higher than all the others,
3. At least one point on your line is lower than all the others.

I felt that was obvious - why did you need to prove it?

I managed to cope with such theorems, but perhaps it does show that I was right not to aspire to be a pure mathematician. During my three years at Cambridge I did (read for) Prelims to Part II, part II and part III of the mathematics tripos. I quite enjoyed geometry, and in the last year I specialized in mathematical physics.

I was tempted to join one of the many theatre groups

in Cambridge, but had been told that this could be a trap where one spent one's entire time acting instead of studying, so did not do so. I'm afraid that I did not join John Cleese at the Footlights, nor precede Stephen Fry, both of whom were active actors during their time at Cambridge.

Not that I spent all my time studying. Our lectures were solely in the morning, Monday to Friday, so I used to study in the afternoons, and had the evenings free. English towns are divided into two general classes: "bracing" and "relaxing", depending allegedly on the quality of the air. Cambridge was definitely "relaxing". In my first year I found that after lunch I'd start by sitting on the sofa reading a mathematics textbook. After half an hour or so I'd be lying on the sofa reading the book, and not long after that the book would be on the floor and I'd be fast asleep.

I kept my high church connections, becoming a regular attender at Little Saint Mary's. Cambridge was full of societies catering for every conceivable interest: in the first few days I was there I met another new undergraduate and informed him that I'd just joined the Fellowship of Saint Alban and Saint Sergius (an organisation dedicated to good relations between the Anglican and Orthodox Churches). He replied "Really - so have I". My attempt to impress had failed!

I learnt to play bridge and four of us in college used to meet once a week for a game in the evening. We all had a similar attitude to the game - fairly serious at the start, but relaxing once the beer was opened. Two of the other players were John Barnes and Peter Caspar, and we've kept in touch ever since. They were also keen on punting on the River Cam. One notable excursion we all made was a two-day punting trip down river to Ely and back.

Towards the end of my first year Mum and Dad wrote to me with the rather startling news that they had moved



**John Barnes and Peter Caspar in the Great
Court of Trinity College**

from Highams Park and were now living in Hadleigh, some 30 miles away near Southend-on-Sea. This meant that I had to find a new vacation job, and I was lucky enough to be taken on in the research lab of Echo Electronics in Prittlewell, a northern suburb of Southend (originally Southend was the South End of Prittlewell). I enjoyed the work, using instruments to determine the thickness of metal pipes and suchlike from the amount of back-scattered radiation.

I'd been on a walking tour of the Derbyshire Peak District with a group from Saint Barnabas Church when I was about 17, and towards the end of my second year I felt it would be good to organise a small hiking tour in Lux-



Rodney punting on the Cam

embourg. I mentioned it to John Wells from Saint Barnabas, who was in Cambridge studying to become a Church of England priest. He was interested, so he contacted a Dutch friend Sally den Engelsman while I advertised in a student paper. The advertisement was answered by Beryl Molloy and I went ahead with organising a two-week walk round Luxembourg for the four of us, staying at youth hostels. This was long before the days of the Internet, so each night's booking had to be made by a separate letter. I urged all of us to make sure we wore boots that were well broken in. The tour went well, except that Sally, who had radiated efficiency when we met her in Brussels, was wearing new boots that the salesman had assured her did not need breaking in. Sure enough, her feet soon came out in blisters and she had to retire back to Holland while the remaining three of us completed the planned tour.

When I arrived in Cambridge I was uncertain of how I was going to cope academically. Many of my fellow under-

graduates made remarks after lectures implying how easy they found mathematics, and I was somewhat daunted by such aplomb. (Looking back I can see that I hadn't appreciated that being a College Scholar itself meant that the college thought I was capable of doing well.) There were examinations every year, and at the end of my first year I obtained a second class result. That was by no means a failure and I felt reasonably happy with the outcome. Then a letter arrived from my tutor saying he was sorry I hadn't made a first. I thought - "Oh! I should have done better." So next year, and the year after, I did, and graduated with a first class degree (a distinction in part III). That was another illustration of how a word to a student can be transforming.

In my last year I began to think about what I would do after graduating. I wasn't keen to study for a PhD, feeling that at 21 I'd like to earn some real money, so I applied for a number of positions in research laboratories. However, I kept being interviewed by Doctor so-and-so, so began to wonder if I was doing the right thing.

Then one vacation one of the men in the lab at Echo Electronics showed me an advertisement in the Guardian newspaper for Ph.D. scholarships at the new Australian National University (ANU) in Canberra, at a quite generous stipend. I was open to the idea of going overseas - in fact I'd already applied to the Australian Defence research people in South Australia, but had had no reply - so I applied. Within a fortnight I had a reply from Professor Le Couteur of the Theoretical Physics Department saying he was recommending my application and he was confident it would be accepted. So I was bound for Australia! (An offer did arrive later from the Australian Defence research people, but by then I was very happy with the idea of going to the ANU.)

Chapter 2

Finding my feet

2.1 First taste of Australia

On 15 August 1961 I departed England from Tilbury on the Peninsula and Orient (P and O) liner Orontes. We went via Gibraltar and South Africa to Australia, arriving in Sydney on 24 September, so I was on board for 40 days. It was the first of three similar voyages, so I've spent the best part of four months of my life at sea. There were plenty of young people on board and we enjoyed life. I was introduced to another mathematician bound for the ANU to study for a Ph.D. - Martin Dunwoody.

At Canberra Railway Station we were met by Professor Le Couteur, a tall man with a vague, gentle manner. He was also a graduate of Cambridge, having been at Saint John's College, next to Trinity. He drove us to the ANU and I thought it must be in the country as we saw only a few buildings and no houses. When we arrived at University House, where I was to live, I was surprised to be told that the Civic Centre was only a ten-minute walk away.

Canberra then had a population of only 50,000, not a single traffic light, and the houses were tucked away in planned suburbs off the main roads. I loved it. The University was a significant part of the town. The Australian government was busy moving departments from Melbourne

to Canberra, so there were lots of single people, living in government hostels or shared accommodation, and lots of parties and picnics. I was taken down to the nearby New South Wales south coast and was entranced by this wonderful area, where then one could live in a simple cottage among the tall eucalypts right next to a pristine beach.

The Theoretical Physics Department was part of the Research School of Physical Sciences (RSPHYS). Nowadays a big feature of central Canberra is Lake Burley Griffin and RSPHYS stands beside it. The lake was not there when I arrived and RSPHYS was instead next to the racecourse. One holiday Monday I was in my office, unaware that it was a holiday, when I was disturbed by the sound of horse's hooves going past my window!

In 1963 I organised a train trip for a group of research students to Captain's Flat, a New South Wales town 28 miles from Canberra. We took the train from Queanbeyan to Bungendore, where we changed for the train to Captain's Flat. Each leg of the journey took over an hour! At Captain's Flat we headed for the hotel and lunch. It was a memorable trip.

I revived the interest I'd had at school in the theatre. There was a meetings room in University House in which some of the residents performed acted play readings, and I joined them. One didn't usually try to learn the lines, but read them from the book while moving around. It worked surprisingly well and meant we could put on a lot of plays. There was also the ANU Dramatic Society, which put on plays in the Childers Street Theatre (a large wooden hut). In 1962 I acted with them in a production of Chekhov's "The Cherry Orchard". There were two residents of University House who were from Canada: Walter Learning and his wife Leah. Walter was very interested in the theatre and joined the Canberra Repertory Soci-



University House, Canberra, 1963

Barry Preston, Geoff Yeo, Terry Scruton, Rodney

ety. They returned to Canada, but Walter obviously liked Canberra, as he became a regular visitor and went on to produce a number of plays with Rep during his visits.

In June 1964 the Beatles performed in Sydney. Six of us from University House (John and Maureen Sass, Bob Pidgeon, Christine Walmesley, Terry Scruton and myself) went to see them. Before the show we had dinner at Buck's Steak House, which was introducing the American idea of tender steak to Australians. The steak was marvellous - the tenderest I'd ever tasted - a lasting memory.

Another great friend I made in University House was Gerry Walsh - we enjoyed many glasses of beer together.



Captain's Flat, 1963

Ian Briggs, David Plant, Ken Lyall, Gerry Walsh,
Nel Cain, Ian Falconer

His field of study lay between geography and history, which did not serve him well when he submitted his PhD thesis. Apparently his examiners were either historians or geographers, and neither liked his intermediate approach, so the thesis failed. Even so, he became a lecturer in the Royal Military College at Duntroon (later the Australian Defence Forces Academy), and in 1969 wrote to the commandant complaining of the brutal “bastardization” of junior cadets by their seniors. The letter was leaked to the press, and would have been described as “courageous” by Sir Humphrey in the TV series “Yes Minister.” It showed up the failings in the system, but did his career no good.

Gerry died in 2014. I had tried to keep in touch with Gerry, but unfortunately I was unaware of his death until two or three months later, when we were visiting a mutual friend Julian Owen on the New South Wales south coast, where Julian gave me the sad news.

Being a PhD student did seem to me to be like a long holiday, free to do what I liked. However, I did work, at any rate most of the time. Le Couteur had suggested I look at S-matrix theory, which is a sub-branch of quantum field theory. I wasn't making much progress when I saw in the *Journal of Mathematical Physics* a paper by Andrew Lenard in which he solved the problem of calculating the partition function of a one-dimensional Coulomb gas of free particles of equal and opposite charge. In the paper he contrasts this problem (where the interaction potential is linear in the distance) with that of charged particles in a neutralising charge background (where the potential is quadratic). This second problem was unsolved and was one that I thought maybe I could tackle, so I did and solved it. At Le Couteur's suggestion, I submitted my first paper in September 1962 to the *Proceedings of the Cambridge Philosophical Society*. It was accepted and published in 1963. It was the first of five papers I wrote during the course of my PhD studies.

Calculating partition functions is part of statistical mechanics, a subject that goes from the microscopic to the macroscopic by trying to understand the thermodynamic properties of matter from a knowledge of the inter-atomic interactions. I have remained in this field for the rest of my working life. In 1964 I submitted my PhD thesis. The overseas examiner did express reservations as to the relevance of one-dimensional systems to real physics, but nevertheless it was passed and I was awarded the degree.

I still did not think of myself as an academic, and

once again started to apply for posts in research laboratories. I applied to the Iraq Petroleum Company, which was a London-based company owned by more well-known companies such as Shell and Compagnie française des pétroles. I was interviewed in Melbourne and accepted. On 2 September 1964 I and Martin Dunwoody embarked in Sydney on the Dutch ship “Willem Ruys”, bound for England via New Zealand, Peru, Panama, New York and Bermuda, a voyage of just over a month.

2.2 Back in England

My parents had moved again by the time I returned to England and were now living at Ramsden Heath, a village south of Chelmsford in Essex. It was natural for me to move in with them, but I probably should have found a flat in London fairly quickly as Iraq Petroleum were in Cavendish Square in the West End, near Oxford Circus. It was an hour and a half commute each way from Ramsden Heath to the West End - a bus to Billericay, train to Liverpool Street, tube to Oxford Circus. The job was interesting, but not as exciting as I'd hoped - I'd had some idea I'd be flying to and fro the Middle East (a more attractive proposition then than now), maybe sipping cocktails in a transit lounge in Rome! Instead it was a London office job with a long commute. One day I was walking down Regent Street when a man who was a contemporary of mine at Bancroft's saw me. He asked why he hadn't seen me at Bancroft's Old Boy's Club. I replied that I'd been in Australia, to which he responded “You should come more

often". Clearly being in Australia was no excuse for non-attendance!

In Iraq Petroleum I was classified as a "reservoir engineer" - I think this title was chosen in case I did go to Iraq, where the government was beginning to resent expatriate employees and the company could make a better case for sending an engineer than a theoretical physicist. There was a little group of us theorists working under Stan Natanson, an likeable and effervescent man who enjoyed a whisky after work. I worked on the company's Fortran computer programs, which they'd bought from a New York consultant firm, I suspect at great expense. They had one for solving the diffusion equation to calculate the flow of oil underground. It used a numerical integration method and the user had to input the time step. Since the engineers were only interested in looking at the output every six months, that was the time step they'd use. The trouble was that it was much too coarse to give any accuracy - after some thought I realised that a time step of about a day was about right - long enough to avoid instability problems in the numerics, but short enough to be fairly accurate. It was an easy matter to modify the program so that it calculated the optimum time step and printed out the results at the intervals the engineers required. I did this, but left soon afterwards, so I doubt if my modification was in fact used.

The company was good about informing its employees about developments in the Middle East. Every day they put out a brief news letter. One did feel that one was close to real action.

Le Couteur had told me before I left for London that I could come back to Canberra if I wished, and as the months of commuting went by I found the idea more attractive. This in turn made me less inclined to go to the

bother of leaving Mum and Dad for a flat in town, so it's probably true that I didn't really give the job a fair go. Anyway, after five months or so I wrote to Le Couteur and he replied that there was a three-year research fellowship available for me at the ANU, so I handed in my notice to Iraq Petroleum - I think Stan Natanson felt I was doing the right thing in returning to academia.

In late May 1965 I left England by air for Australia. I went via the USA and Canada, taking the opportunity in New York to visit Mark Kac and George Uhlenbeck who were world-class experts in statistical mechanics. I also visited my Great-Aunt Connie and Great-Uncle Frank in Edmonton and saw four old friends from University House who'd been on the trip to Sydney to see the Beatles: John and Maureen Sass in Ontario, and Bob and Christine Pidgeon (née Walmsley) in Pasadena.

2.3 Second taste of Australia

I returned to Canberra in early June 1965 and almost immediately bought a Volkswagen car. That night it snowed and the snow lay inches thick on the ground - the only time I've known it do that in Canberra. The next morning I became anxious that there was something wrong with my new car, as it was making a strange noise as I drove. It was of course merely the snow being thrown up underneath!

I'd had six years of living in residential institutions - Trinity College and University House, and was ready to fend for myself, so rented a government flat. I bought two cookbooks (the first was "Cooking in a Bed-Sitter"

by Katharine Whitehorn, the second was “French Country Cooking” by Elizabeth David) and started experimenting with curries and roasts.

At the ANU I looked at various problems that flowed on from my PhD work. I discovered a neat way of solving the Percus-Yevick approximation for three-dimensional systems where the atoms interact via a potential of finite range, and went on to algebraically solve that approximation for a hard-core potential with a surface attractive interaction - so-called “sticky spheres” - and show that there was a phase transition from a liquid to a solid state. This paper was subsequently quoted widely in the engineering literature, and was a major source of citations for me for the next twenty or more years. In the modern era of competition for research grants, citations are significant part of assessing an academic. Obviously it can be overdone (as can be any method of assessment), but it is true that if an academic has no citations, then one is entitled to wonder what he or she has been doing.

Academics love to attend conferences, often travelling great distances to do so, but I sometimes wonder if they wouldn't do well to look closer to home. One day I went to an RSPHYS colloquium given by a research student, Bob Watts. It turned out that he was trying to numerically solve the Percus-Yevick approximation, and was having difficulties. I spoke to him afterwards and it turned out that my result was just what he needed. It was the start of a useful collaboration and a long friendship with him and his wife Diana. Like me, they hailed from Essex in England. In fact Diana was from Ramsden Bellhouse, just south of Ramsden Heath, where I'd lived with my parents while I was working for Iraq Petroleum.

My flat was across the road from the Canberra Rex Hotel, and a group of us (Gerry Walsh included) used to

meet there for drinks on Friday nights after work. A colleague in the Theoretical Physics Department at the ANU was Roger Kennedy, an American from Seattle. Sometimes on Sunday evenings I used to look in at his and his wife Pauline's house in Hughes for company. Other times I'd go to University House, where I still had friends.

There were no Anglo-Catholic churches in Canberra. As a PhD student I'd attended Saint John's Church in Reid, but I felt the need for a richer style of service, so I started attending the Roman Catholic church of Saint Patrick's in Ipima Street, a short walk from my flat. I spoke to Father Bill Kennedy and after a short period of instruction I was admitted as a Roman Catholic. I wasn't alone: David Hilliard, a history PhD student at the ANU and a resident of University House, did the same. We were both confirmed in 1966 at the small church of Saint Mary's in Braddon. Gerry Walsh was my sponsor.

I kept up my acting interests. I joined with a group of ANU students performing Aristophanes "Lysistrata" in Canberra, with Anne Godfrey-Smith as producer. We took it up to Newcastle, north of Sydney to perform at a drama festival - the only time I've been "on tour". There was a conference of dentists in Canberra and we put on a special performance for them. Lysistrata, sometimes sub-titled "The Women said No", is quite a bawdy play and it was too much for some of the dentists and their wives - a number walked out during the performance! I joined the Canberra Repertory Society and with them played Freddie in Terence Rattigan's play "The Deep Blue Sea", the lead in "Jemmy Green in Australia", and Moses in Sheridan's "School for Scandal".

On one occasion I was in Sydney. It was Gerry Walsh's home town and he was showing me around. He took me into a pub somewhere in or near York Street, saying this

was an interesting pub - the haunt of prostitutes and homosexuals. As we entered a man who was propping up the bar turned and said "Hello, Rodney"! We knew one another from Canberra Repertory - I don't know whether he was a homosexual, but it's possible as homosexuals do seem to be attracted to the theatre. I was amused - I don't know whether I went up or down in Gerry's estimation!

A new arrival at University House in my last year as a PhD student had been John Powell, a very lively Englishman and son of a Chief Petty Officer in the Royal Navy. Shortly before I left Canberra in 1964, he'd organised a number of the residents on a week's trip with two cruisers on the Hawkesbury River, north of Sydney. I hadn't gone on that trip, but when he suggested going on another in 1965 I accepted. It was the first of many such trips on the river, with six or so people on board one of the Halvorsen cruisers. John was a wonderful skipper - he'd be up at 6am checking fuel and drinking water levels, and cooking bacon and eggs for breakfast, and had a fund of interesting stories and amusing jokes. Another participant was Ray Crawford, an English geologist with a remarkable sense of humour.

In late 1967 Le Couteur told me he thought I should get some experience with an overseas university before applying for a tenured position at the ANU. The obvious place for statistical mechanics was the USA, so I wrote to Michael Fisher in Cornell and to Elliott Lieb, then at Northeastern University in Boston (amongst others). Fisher offered me a post-doctoral research fellowship, but Lieb told me he was moving to the Massachusetts Institute of Technology (MIT) and offered me a lectureship in the Maths Department. The latter sounded more like an upward move, so I accepted Elliott's offer for a post in the US academic year beginning October 1968.

In February 1968 I was invited to a birthday party for Daphne Phillips, a Catholic friend who was working for her PhD, in the Meetings Room at University House. There was dancing and I danced with Elizabeth Phillips (who knew Daphne from church, but was no relation). I asked her out and our first outing was, at my suggestion, a trip to Burrinjuck Dam, some 110 kilometres away. I remembered it from a previous visit as quite attractive, but had not allowed for the fact that it was now late summer and we were in a period of prolonged drought. When we got there it was a depressing sight, with an expanse of cracked mud broken by dead trees, the only water a pool by the dam wall with dead fish floating on it.

Fortunately Elizabeth didn't hold this against me and we continued to see one another. She lived in a house in Fawkner Street, not far from my flat, which she rented with three other girls. She was a lawyer in the Commonwealth Government's Attorney General's Department. We got on well together and my thoughts quite quickly began to turn to marriage.

I was due to leave for the USA in August, so there was little time. On Saint George's Day in April, with much trepidation, I proposed and Elizabeth accepted. I was in rehearsal for Sean O'Casey's "Cock-a-doodle dandy" with Canberra Rep, so a visit to Elizabeth's parents in Melbourne had to wait till May. Instead her older brother Peter appeared in Canberra, obviously sent to give me a once-over! We started to plan for our wedding.

A further complication was that until 30 June we could readily obtain visas for the USA because of my British nationality. After that the Americans were changing their rules and it would be more difficult. So we set the date for 22 June, just two months away.

The wedding was at Saint Patrick's, close to where I



Wedding, 1968

Elizabeth Rennick (bridesmaid), Rodney, Elizabeth

lived in Condamine Court. On the day I just walked across the road to the Canberra Rex hotel and took a taxi the three hundred yards or so from there to the church so that I could make something of an entrance! Gerry Walsh had agreed to be my best man, but a few days before said he'd be unable to make it. Fortunately Julian Owen, whom I knew from Repertory and the Canberra Rex, saved the day by agreeing to take Gerry's place. Another friend from the Canberra Rex, John Hepburn, was given the job of driving Julian's car and Julian's wife Helen from the church to the reception at the ANU staff club. He was quite tickled by having this "official" role in the proceedings!

That weekend we drove to Sydney and on Monday morning were at the US consulate to obtain our visas.

We had a short honeymoon at Lilli Pilli on south coast of New South Wales and visited Elizabeth's parents in Hawthorn, a suburb of Melbourne. Then about 12 August we left Melbourne by air for the USA, via Singapore, Athens, Jerusalem, Rome, Malta, England and Dublin. Air tickets were expensive then, but they allowed many stops and changes of airlines.

In Jerusalem we stayed at the King David Hotel, where I narrowly avoided ordering bacon with my breakfast. In Malta we stayed with my cousin Peter, who played the trombone in the British army, and his wife Carol.

In England my sister Eileen put on a big family party as a kind of English wedding party. Elizabeth was introduced to everyone, including Eileen's husband Alf and their four children: David, Neil, Margaret and Rodney. She also met Dennis and his wife Judy and their three children: Jackie, Nicholas and Annette; their fourth child Timothy would have been present but invisible - he was born later that year.

Later I took Elizabeth punting on the River Cam in Cambridge, and showed her Bancroft's School. On 11 September 1968 we arrived in Boston, Massachusetts.

2.4 USA

Cambridge, Massachusetts, is an inner suburb of Boston and contains both MIT and Harvard University, two internationally known leading universities. We were lucky to find a quite large apartment in Langdon Street, the other side of Cambridge Common from Harvard Square and close to Harvard University. To get to MIT I used to walk to Harvard Square, then take the subway to Kendall, from where it was a short walk to MIT (we didn't own a car).

The dogs in Cambridge must have shared in the general high level of intelligence of the suburb, for one day I boarded the subway train at Harvard Square and was followed in by a small unattended dog. It sat quietly on the train and got off at the next station (Central). To this day I've wondered if this was a regular journey it made - it gave every appearance of being so!

At MIT I shared an office with Colin Thompson from Melbourne, and Douglas Abraham from England. Colin discovered a graduate student bar on campus: the "Muddy Charles", named after the river that flows between Boston proper and Cambridge. We used to adjourn there after work on Friday afternoon for a beer. The teaching duties of a "lecturer" at MIT were light. I think I just had to give two tutorials a week, including marking the assignments. My first course was "Calculus for Engineers". As an undergraduate in England I would never have thought of questioning the lecturers or arguing with the tutors, but I quickly realised that American students were not so reticent. They wanted to know why they'd lost points in an assignment, so I'd compile a systematic marking schedule. I quite enjoyed the teaching, and think it's a pity that so

many academics go for years solely doing research, and are then plunged suddenly into teaching students.

There had been some progress in exact statistical mechanics in two dimensions. In 1944 Lars Onsager had calculated the partition function and free energy of the Ising model in zero magnetic field. The calculation was a tour-de-force, using the properties of Lie algebras. Then in 1967 Elliott Lieb had solved a number of two-dimensional “six-vertex” models by the Bethe ansatz method, adapting the work of C.N. Yang and his brother C.P. Yang on a one-dimensional problem in quantum mechanics. (C.N. Yang and T.D. Lee had won the 1957 Nobel Prize for Physics). The problem of calculating the partition function can be expressed as that of calculating the eigenvalues of the transfer matrix that builds up the lattice row-by-row. In the Bethe ansatz one does this by guessing a form for the eigenvector and showing that it works. This also gives the needed eigenvalues.

I was sensible enough to try to understand Lieb’s method, and was able to use it to solve some related problems. Elliott was interested and helpful. The first such model Elliott had solved is the “ice model”, which can be thought of as a combinatorial problem, equivalent to counting the number of ways of colouring the faces of a chess board (with an arbitrarily large number of rows and columns) with three colours, no two adjacent faces having the same colour. I extended this problem to one of asking the same question, but also specifying how many were to be coloured (say) red, how many white, and the remainder blue. This problem turned out to be solvable using elliptic functions. I’d never struck such mathematical functions before, but I learnt enough about them to solve that problem. This knowledge turned out to be extremely useful later.

There was a regular statistical mechanics meeting at the Jewish Yeshiva in New York, organised by Joel Lebowitz. At Lieb's suggestion, I attended, along with Colin and Douglas. It was quite a small meeting then, but for me it was a real eye-opener - when I walked into the room I was almost immediately introduced to Percus and (I think) to Eddie Cohen. The people whose papers I'd been reading for the last seven or so years were there, standing in front of me. It was the first of a number of such meetings I attended, at which I met other famous names in the field, including Lars Onsager, Michael Fisher and almost certainly Mark Kac. One meeting was on Saint Patrick's Day in 1970 and Elizabeth came down to New York with me and went off to watch the parade in Fifth Avenue.

Bob Watts was now in Kitchener, Ontario and knew I'd arrived in Massachusetts. He wrote asking me to spend our first Christmas in North America with himself, his wife Diana and their children. I replied that Elizabeth and I would be delighted. We made the trip by Greyhound bus and had a lovely Christmas. During it he said they'd been a bit perplexed as to who Elizabeth was and what the sleeping arrangements should be - they'd left Canberra shortly before Elizabeth and I had met and rapidly married!

We made a few trips around Massachusetts and neighbouring New Hampshire. The first February we had a brief holiday on Cape Cod to escape the depressing sight of the grey snow and slush in Boston - there was snow on Cape Cod, but it was sparkling and clean. We also made a trip to New York and Washington.

At the end of the first year I was promoted to associate professor, so next year I actually lectured to the students on the courses, one of which was on complex variables. This was a subject I must have been taught as an undergraduate, but had largely forgotten. I found it quite fasci-



**A New England winter - on holiday in
New Hampshire**

nating, and it stood me in good stead later..

We enjoyed living near Harvard. There were all sorts of activities one could participate in. Initially we went to Mass on Sunday mornings at Saint Paul's Church near Harvard Square. We very much liked it. The liturgy was now in English rather than Latin, but at Saint Paul's it was still a grand occasion, with most of the anthems, such as the Gloria, sung by the choir and congregation in Latin. We liked this combination, which preserved the beautiful music of the liturgy. In contrast, in Australia the entire liturgy was required to be in English and had lost much of its grandeur.

Some Jesuit priests in Melbourne had given Elizabeth (via her father) the name of the Harvard Catholic chaplain, so after a month or two she contacted the chaplaincy. It turned out that that priest had left. The new chaplain was Richard Griffin. He was very welcoming and invited us to attend a student Mass at Phillips Brooks House on campus. (Phillips Brooks was an American Episcopal clergyman who wrote the Christmas carol “O Little Town of Bethlehem”. He became Bishop of Massachusetts near the end of his life.)

We went along next Sunday and loved it. The service was a great contrast to Saint Paul’s, but it was so informal and friendly that one couldn’t help being involved. It became our regular place of worship.

We weren’t the only non-students attending. Towards the end of the next vacation Richard Griffin pointed out that the room was almost full and the students hadn’t yet arrived. Very gently he suggested we might make some other arrangement. There were a number of priests in our group, so all we needed was a venue. Someone arranged for us to meet on Sunday mornings in the chapel of the Episcopal (Anglican) Theological School on the other side of Cambridge Common. In a humorous reference to our origin, we called ourselves the “Interlopers’ Eucharistic Community”. Elizabeth and I were regular attenders and we made many friendships there, some of which have lasted to this day.

Elizabeth dropped in at a “Drop-In” centre near Harvard Square and met a New Zealand woman, Ruth Humphrey. Through her we also met her husband Bill (an interesting American who made a living inventing things), and Val Evans, an Englishwoman whose husband Tad was the Episcopalian chaplain to Harvard. Val and Tad lived just round the corner from us and were very welcoming. We formed

lasting friendships.

Harvard Square could seem to be the academic cross-roads of the world. One day I was walking through it when a voice said “Hello, Rodney”. It was Ray Crawford from the University House trips on the Hawkesbury river. He went on to be Acting Master of University House, and would have liked to become Master, but it was not to be.

Opposition to the Vietnam War was even more vocal in the USA than in Australia. There were two Moratorium days while we were there, with big processions through Boston and Cambridge. The morning after the second one I walked as usual to Harvard Square and found it resembled a war zone with broken windows and much damage. A splinter group from the Moratorium march had started a riot there the night before and had a violent confrontation with the police. Although we hadn’t known it, we’d spent the previous night in Langdon Street under curfew!

Early in my second academic year at MIT I was surprised when Le Couteur walked unannounced into my office. He gave me a copy of the advertisement for a tenured post in the Theoretical Physics Department at the ANU - a post he’d arranged with me in mind. I was a bit stunned. We had immigrant visas for the USA, had made many friends and were beginning to settle in. I rather wished the problem would go away and delayed making the application until I received a letter from Le Couteur reminding me that the closing date was approaching.

I did apply and I’m glad I did. I was accepted and from then on was an employee of the ANU. The decision could so easily have gone the other way and life would obviously have been very different. One factor in the decision was that I’d already put in an application for a research grant from the National Science Foundation. I wasn’t successful, but I realised that that was the usual thing to do in the

USA. By contrast, at the ANU I would have a full-time research appointment and I would not be dependent on successful grant applications.

I handed in my resignation to MIT.

We'd wanted to spend some time with my family in England before returning to Australia and had wanted to make the England-Australia trip by sea. Air travel had almost completely taken over from sea and there were only a few ships left making the run. To catch one, we had the choice of two or five months' wait in England.

We chose to stay five months and to return to Australia on the P & O liner *Arcadia*. We left Boston for London on a chartered student flight on 17 June 1970.

2.5 England and the voyage on the *Arcadia*

Initially we had trouble settling into the quiet life in England. We were staying near Frinton-on-Sea in Essex with my Mum and Dad. Boston had been a hive of radical activity, while the most exciting possibility of action in Frinton seemed to be people "picnicking on the greensward", which was forbidden by council regulations. Elizabeth and I discovered a group of young American archaeologists in the area who drank in the evenings at the Bell pub in nearby Thorpe. We joined them a number of times to hear news of what to us now seemed like the real world.

Thanks to my family, we did in fact settle into our five-month holiday in England and enjoyed it immensely. We made a number of trips. In September we rented a boat



At Mum and Dad's house in 1970

Dad, Eileen, Rodney, Mum

on the river Shannon in Ireland for two weeks. We were inspired to do this by John Powell, who'd done the same some years before. That was great. Usually we would tie up for the evenings in a town or village and go ashore to the pub, but sometimes we'd find a quiet spot to cast anchor and spend a peaceful night by ourselves on the boat. Being Ireland, there was a reasonable amount of rain, but there was one glorious day crossing Lough Ree when the sun shone and it felt like the Mediterranean. Afterwards we spent a few nights in Glencolumbkille in County Donegal. We also went walking in the Peak

District, and crossed the Channel to Belgium, where we gorged on delicious mussels in Brussels.

Towards the end I picked up a paper I'd written at MIT on a generalization of Elliott Lieb's work on the Bethe ansatz. I noticed something I hadn't noticed before. There were lots of free parameters in my generalization - one for each row and column of the lattice, plus one overall parameter. The partition function depended on all of them, but the eigenvectors only on the overall and columns parameters. They were *independent* of the row parameters.

This invariance meant that the transfer matrices all commuted with one another. This was a very significant property. Could it be proved directly, without going through the lengthy Bethe ansatz calculation?



Walking near Frinton in 1970

In Frinton I looked at this problem and quickly found the answer was yes. Further, while I was at MIT Elliott had remarked to me that a natural and interesting generalization of his models was the “eight-vertex model”. This didn’t have the “conservation of down arrows” property that his models did, so one couldn’t use the Bethe ansatz and was stuck.

However, did the eight-vertex model have the “commuting transfer matrices” property I had just discovered? It wasn’t difficult to show from first principles that the answer was yes. There was a sufficient local property that ensured this commutation, which could be viewed as an extension of the “star-triangle” relation that had been used in the 1940’s to convert an Ising model on the honeycomb lattice to one on the triangular lattice. Years later, Ludwig Faddeev christened this property the “Yang-Baxter” relation (C.N. Yang had used a similar equation in a different context), and the name stuck. In fact this commutation property of the eight-vertex model had been discovered earlier that year by Bill Sutherland (a student of Yang’s), but I was unaware of it.

Further, for the six-vertex model, one could interpret the equation for the eigenvalues as a relation between the transfer matrix and another matrix Q , and one could use this relation, together with the theory of complex variables that I’d been teaching, to obtain the thermodynamic properties of the six-vertex model. One didn’t need the Bethe ansatz. Could one also extend this reasoning to the eight-vertex model? Again, the answer was yes.

I’d done the preliminary steps in this work in our last weeks in Frinton. It was exciting, but much remained to be done, so during the voyage back to Australia on the *Arcadia* I worked away at the problem in the ship’s library, polluting the air with my pipe smoke as I did so. The work-

ing was full of the elliptic functions and complex variable theory that I'd become proficient in while at MIT.



The P & O Arcadia

I didn't spend all my time working - about 4 o'clock I'd join Elizabeth at the swimming pool, where she endeavoured to teach me to swim. There were two elderly ladies who often watched us. Then we'd change and go to dinner and on to drinks in the bar and sometimes dancing afterwards. There was a party on board the night before we docked in Fremantle. Next morning the two ladies surprised Elizabeth by asking after her "fiancé". She replied that I was her husband. They said they were delighted as they felt we were so well suited to one another. Apparently they'd decided we were the shipboard romance and the party was for our engagement!

My sum was pretty well finished by the time we docked in Melbourne. I submitted a short paper announcing the result to Physical Review Letters on 25 February 1971, a longer, more detailed one to Annals of Physics on 20 May 1971.

Chapter 3

My career at the Australian National University

3.1 Canberra, USA and Scotland 1970 - 1979

We docked in Melbourne on 15th December and were met on the quay by Elizabeth's parents. Elizabeth stayed with them until after Christmas, but I went up to Canberra to report to the ANU for a few days. While there the ANU housing officer showed me three houses available for us to rent. I chose the one closest to the ANU (it was a 40 minute walk to the Physics School, but only 10 minutes to the Civic Centre). It was in Reid, a suburb that then was slightly scruffy - I didn't mind that as it meant we'd have less trouble keeping up with the Jones's. Now it's a sought-after location and quite upmarket. Elizabeth clearly approved of my choice - after a year we bought the house from the ANU.

In 1971, as a result of my papers on the eight-vertex model, I received a letter from C.N. Yang inviting me to spend a few months sabbatical at his theoretical physics institute in Stony Brook, on Long Island in New York State. This was quite an honour: Le Couteur encouraged me to go.

We left Canberra in January 1972 and flew to California, where I'd been invited (possibly at Yang's suggestion)



**Christmas 1971: Elizabeth with her mother
and father, May and Alfred Phillips**

to speak at a theoretical physics conference. From there we flew to Vancouver, Canada, and then took the train through the Rocky Mountains to Edmonton, to see great-aunt Connie and great-uncle Frank. Because the train was delayed, we had magnificent views of the snow-covered Fraser Valley and the Rocky Mountains.

There aren't too many groups working in theoretical statistical mechanics in the world, but by chance there was one at the University of Alberta, led by Donald Betts. I'd arranged to give a talk there. It was only a kilometre's walk from Auntie Connie's to the university, but the temperature had plummeted to minus 40 degrees (Centigrade or

Fahrenheit - that's where they're the same). I rang Donald and asked whether it would be sensible to walk to the university in these temperatures. His advice was that I could, but if I did start to feel cold to go into a shop to warm up, and not to run. Apparently it doesn't do your lungs any good to take deep draughts of such cold air. I made it!

Such weather wasn't particularly uncommon in Edmonton. Uncle Frank lived to age 94 and Auntie Connie to age 99, and I wonder if their long lives were because of being so often in cold storage. Auntie Connie told the tale of how one day she was on a bus in Edmonton when the negro conductor came up to her and, without any warning, started to rub her nose between his hands! Apparently he'd noticed that she had the beginnings of frost-bite, probably as a result of standing in the open waiting for the bus.

After two or three days in the Edmonton refrigerator, Elizabeth and I flew on to New York and Stony Brook.

In Canberra I'd worked out how to obtain the eigenvectors of the eight-vertex model transfer matrix. The calculation started by obtaining some simple eigenvectors and then using a Bethe ansatz type of method to obtain linear combinations of those to form all the eigenvectors. In Stony Brook I wrote this up and gave lectures on the method at the same time. I wrote three papers there and I felt I'd earned my keep - towards the end of my stay I visited an optician and was given a prescription for stronger glasses!

At Stony Brook I met Barry McCoy, who also worked on mathematical models in statistical mechanics, and who has been a friend and colleague ever since. We left Stony Brook mid-May and flew home, first to England and then to Moscow, where I'd booked a 24-hour stop-over with the USSR tourist office.

It was interesting in Moscow. We stayed at the Hotel National near Red Square, very close to the Kremlin. In the evening we saw groups of young women factory workers arm-in-arm strolling happily through the streets, enjoying the warm weather and the long hours of daylight.

The Hotel National was grand and old-fashioned, and a favoured venue for special celebrations. We saw a private dining room set with a gilt-edged dinner service, shining silver and sparkling glasses. The guests were arriving in evening dress. In another room there was a post-wedding party and the revellers beckoned us in. We regretfully declined - getting drunk on vodka wouldn't have been a good preparation for our personal tour next day and the subsequent flight.

Our suite of rooms was stuffed with French antiques, including a baby grand piano and a pair of Sèvres vases decorated with portraits of Napoleon. Though fine, it was all slightly shabby, particularly the bathroom, which had a wobbling toilet and a mouse hole. In the morning there was a dead mouse on the floor (perhaps it had eaten some poison). I decided I wouldn't let this pass, so scraped it up onto a piece of paper and carried it down the hallway towards the formidable woman concierge. As I did so I began to wonder if she would pour withering scorn on a decadent bourgeois westerner for making a fuss about such a little thing as a mouse, and a good proletarian mouse at that.

Not so: she peered in puzzlement at my piece of paper as I approached until she finally saw the mouse and leaped away, giving out a very feminine and frightened "Yeek"! I handed the paper to a nearby small inconspicuous male janitor and left.

We had our own guide and were shown the Kremlin, GUM department store and other sites. I'd been told the

Russians liked to be tipped in cigarettes, but not told that they had to be western ones, so when we arrived I stocked up with Russian ones. Our guide and others were obviously disappointed. I still don't know what was wrong with the Russian cigarettes: she'd been telling us all day how wonderful everything was in Russia.

When we were in Boston I'd met Fred Wu, who was at Northeastern University. He and his wife Jane and daughters came to Canberra in 1973 and together we worked on a three-spin model on the triangular lattice, which turned out to be solvable by the Bethe ansatz method.

Every Christmas, Professor Le Couteur and his wife Enid used to throw open their house and garden in Yarralumla for a party for all the members of the department of theoretical physics. Enid, a very skilled needlewoman and cook, must have been busy for weeks making presents for the children, cooking cakes and making mince pies. Our daughter Ann was born in October 1973 and that year I was Father Christmas at the Le Couteur party. One of our first pictures of Ann was taken at the party and shows Elizabeth introducing me to Ann as Father Christmas. Ann does not look amused!

We had another sabbatical in Edinburgh, Scotland in 1975, again taking the opportunity to visit friends and relations on the way. A curious advantage of living in Australia is that when you go to North America or Europe, virtually anywhere else in the world is on the way! My parents had their Golden Wedding celebrations in June, so we were able to be there with the rest of my English family.

In Canberra as a research fellow I'd looked at the monomer-dimer problem on the rectangular lattice and had developed an approximate variational method for calculating partition functions. It gave quite good numerical results and the problem has never been solved exactly. In Ed-



Christmas, 1973

Rodney (Santa Claus), Ann, Elizabeth

inburgh I started what I felt would probably be a fairly pedestrian calculation to apply these ideas to the eight-vertex model. It was to pay off handsomely as it led to the development of “corner transfer matrices”, where one builds up the lattice by rotating about a central site.

Neville Temperley had organised a statistical mechanics conference in Aberdeen. It was a couple of weeks after we were due to leave Edinburgh, so we rented a car and toured the Scottish highlands as far as Skye before heading back to the conference. The weather was beautiful - clear blue skies and sunshine. We went to western Scotland again in 2012 and the weather was the same. Clearly western Scotland has a Mediterranean climate!



Mum & Dad's Golden Wedding, 1975

Top row: Alf, Dennis, Margaret, Eileen, David, Nicholas, Judy, Jackie, Rodney **Bottom row:** Rodney, Neil, Thomas and Florence Baxter (Rodney's parents), Ann, Elizabeth, Tim.

We returned home in mid-August. We'd been away from Australia for almost nine months, so after a few days we headed down to Hawthorn to see Elizabeth's parents, who were eager to see their granddaughter again. We had a happy ten days or so with them during which Elizabeth's brother David and his wife and two small sons came down for a day from Nagambie, where he was the G.P. It was Elizabeth's birthday and we have pictures of us all sitting happily in the sun with Elizabeth's father. Sadly, just five

days later he had a heart attack and was taken to hospital, where he died that night, on 29th August. It was as though he'd kept going until he could see Elizabeth and Ann once more.

Our son Andrew was born on 20 November 1975 and christened on 14 March 1976 at Saint Patrick's Church. The priest was Justin Barwick, an old friend of mine from before my marriage. Elizabeth's older brother Peter, his wife and five children came to Canberra for the occasion. Both of Elizabeth's brothers were doctors in Victoria: Peter was in Echuca, David in Nagambie. There were many other friends and relations there, including the Le Couteurs and Bob and Christine Pidgeon.

Another event in 1977 was my election to the Australian Academy of Sciences. (They'd given me their Pawsey Medal for young researchers in 1975.) It was a productive time for me. I'd realised that even though the corner transfer matrices I'd studied in Edinburgh were ultimately infinitely dimensional, nevertheless for the Ising, six-vertex and eight-vertex models they had factorization and commutation properties that enabled one to calculate their eigenvalues, from which one could derive the spontaneous magnetization. Onsager had calculated the free energy of the Ising model in zero field in 1944, but it wasn't until 1949 that he announced his and Kaufman's result for the magnetization. Even then he didn't publish it - the first published derivation was by Yang in 1952, and that was a long and intricate calculation. In 1976 I showed that the same result could be obtained very easily (but certainly less rigorously) by corner transfer matrices, and that the method extended straightforwardly to the eight and six-vertex models. I was thus able to verify the conjecture that Michael Barber and I had made in 1973 for the spontaneous magnetization of the eight-vertex model.



**Enid & Kenneth Le Couteur at a party
in our garden in 1985**

Even for models that have so far defied exact solution, one can use corner transfer matrices to obtain good numerical approximations or long series expansions. In 1978 Ian Enting (a research fellow in the ANU theoretical physics department) and I used them to double the known length of the series expansions for the free energy of the Ising model in a magnetic field (a problem yet to be solved exactly).

Also, my then PhD student, Shui Kuen Tsang and I made some approximate numerical calculations, using corner transfer matrices, on the “hard hexagon” model. This

is a two-dimensional lattice gas, where one puts particles on the sites of the triangular lattice so that no two are together or adjacent. I realised that the eigenvalues appeared to have the same property that occurred in the eight-vertex and Ising models, namely that they were integer powers of a common number. This suggested that the model was solvable, and indeed in 1979 I was able to find a generalization of it for which there is a Yang-Baxter relation, and hence solve the model exactly. Intriguingly, the calculation naturally involved the Rogers-Ramanujan and related identities that occur in mathematical number theory. This model is two-dimensional, but nevertheless is quite a realistic model of a lattice gas, having a phase transition from a liquid to a solid state (like water to ice). It's properties have been compared quite successfully with experiments on very thin films.

There haven't been too many of my relatives who have come all the way to Australia to visit. The first were Auntie Connie and Uncle Frank, who came in 1962 when I was still a research student. The next were my Aunt Cis and her cousin May, who came in 1979. We took them to Tidbinbilla Nature Reserve near Canberra. A flock of emus was roaming in the picnic area where I cooked sausages for the family. I had just dished the sausages up and Andrew was sitting happily contemplating his when it seemed to miraculously disappear. Elizabeth was sitting opposite and said an emu had whipped its head past Andrew and stolen his sausage in a fraction of a second: Andrew just sat there looking utterly bewildered!

3.2 Europe and the USA 1980

I was invited by Eddie Cohen to give four lectures at a workshop in Enchede, Holland in June 1980. I was also told

I'd been chosen for the Boltzmann Medal, to be awarded at the IUPAP meeting in Edmonton in August 1980. Yang must have known of this, because he invited me to again spend some months at Stony Brook after the meeting. The invitation must have arrived in 1979 just as Elizabeth, Ann, Andrew and myself were leaving for a week or so's holiday at Hyams Beach on Jervis Bay in New South Wales, a four-hour drive from Canberra. I remember sending Yang a telegram from the post office in the village store in Hyams Beach and being suprised a day or so later when I went into the store to be told there was a telegram for me. It was a reply from Yang - he (or perhaps his efficient secretary Kitty Turpin) must have somehow replied to the location whence the first telegram originated. I was impressed - by Yang (and/or Kitty), and by the clerk in the Hyams Beach post office!

A complication arose due to the fact that I'd been a smoker. I'd given it up in December 1979, but in January 1980 my voice became strange and I was found to have a malignant tumour on my vocal chords. It was treated by radiation in Sydney. The treatment ended in early May and I asked the doctor if I should be going overseas. He wasn't worried about my going, but was concerned that my voice, while it would be recovering, might not be up to the strain of giving an hour's lecture. I solved the problem by writing out my lectures word for word, jokes and all, and having Elizabeth record them onto tapes. Then, when I was in Enschede, Edmonton or Stony Brook, I'd play the tape while I stood beside the overhead projector showing my transparencies, using a pointer and occasionally interrupting to amplify a point (I could speak for short periods). The audiences (many of whom were not native English speakers) liked it, remarking how clear the talks were, with no umm's or arr's. Also, Elizabeth's voice is normally clearer than

mine: although she had no background in mathematics, she managed to make it sound convincing.

The Sydney doctor had said I should have a check-up while overseas and had given me a referral to Doctor Lederman in Harley Street in London. While in Holland I telephoned (via the Dutch operator) to Dr. Lederman to make an appointment for my first check-up. A few days later we went to England and I phoned Dr. Lederman to confirm my appointment. He said I had one, but he wondered why. He was a gynaecologist! There were two doctors Lederman in Harley Street (I believe they were brothers) and the operator in Holland had put me through to the wrong one! Fortunately I was able to secure an appointment with the right doctor for a few days hence, and I passed my check-up.

From my point of view, it was fortunate that the presentation of the Boltzmann Medal took place in Edmonton. My great-aunt Connie and great-uncle Frank were able to attend, as did Elizabeth, Ann and Andrew. I didn't quiz them about the content of the physics talk I gave afterwards!

We went on to Stony Brook, where we stayed till the end of the year, then returned home to Canberra.

3.3 Canberra, Italy and the USA 1982 - 1992

In March 1982 I received a telegram from the Royal Society of London telling me they'd elected me a Fellow. This was great honour, and naturally it meant much to me because of my English origins. Sir Rudolf Peierls, FRS, who then headed the theoretical physics department at Oxford University, was visiting Canberra at the time and was talking to Le Couteur when I went in and showed them the

telegram: they both warmly congratulated me. Next year the Australian Academy of Science awarded me their Lyle Medal for research in mathematics and physics.

John Powell, my friend from my University House days, had married another graduate student Jocelyn Wheeler. They'd lived in New Guinea for some years but had now returned to Australia and were living in Sydney. They'd had bought themselves an old wooden house at Spencer, where Mangrove Creek meets the Hawkesbury River, as well as a boat they christened "the Saucy Mrs. Flobster". In 1982 we visited them twice, in June and September, rowing up Mangrove Creek and going out in the boat. John was great fun and Ann and Andrew obviously loved being with him on the boat. We had many such happy experiences with the Powells on the Hawkesbury River.

In October 1982 the Queen and Prince Philip visited the Australian War Memorial, which is less than a kilometre from our house, so I walked there and took two good photos of them. I'd seen them before, in March 1977, going up Anzac Parade (only 200 metres or so from our house) to the War Memorial.

One thing I've always liked about living in Canberra is that it is a capital city, but so easy to get to whatever is happening. Recently we've been in London a couple of times when the Queen and Prince Philip have appeared in public near to where we were (once was her Diamond Jubilee), but we weren't able to see them because of the crowds.

Eddie Cohen and his wife Marina visited Canberra in November 1982 and we enjoyed a cruise on Lake Burley Griffin with them - the sort of thing you only do when you're entertaining visitors, as the rest of the time you're too busy.

In 1983 George Andrews, the American number theorist



With the Powells on the Hawkesbury River

Andrew, Joceneyn, John, Elizabeth, Ann

in Pennsylvania, arranged to come to Canberra, with his wife and children, for a sabbatical. We worked together on possible extensions of the relation between the hard hexagon model and the Rogers-Ramanujan identities, and did indeed find one that we published in early 1984. We went on to find another, but George had returned home and we were both busy, so we delayed writing it up and Kuniba, Akutsu and Wadati pipped us at the post in early 1986.

At the invitation of Mario Rasetti, I had another sabbatical in 1984 in Turin, Italy with Elizabeth, Ann and Andrew. Afterwards we took the train from Turin to Paris, where I visited Jean-Marie Maillard and Marc Jaekel at the École

Normale Supérieure. Jean-Marie was working on statistical mechanical models and impressed me by writing down the Yang-Baxter relation in the simple form $ABC = CBA$. I knew immediately what he meant, but I think it was the first time I'd seen it expressed so succinctly. We then went to England and I received an ScD degree from Cambridge University. For this I'd submitted my book "Exactly solved models in statistical mechanics", which had been published in 1982. I was now an FRS and a Cambridge ScD. I may not have set out to be an academic, but I'd certainly become one!

I'd been invited to a conference organised by the London Mathematical Society in Durham, England, in late July 1986. While I was still making arrangements to attend, I received the sad news that Dad had died on 1 May. I had been appointed Head of the Theoretical Physics Department when Le Couteur retired the previous December. (I was clearly the default option - I had hoped the ANU would advertise internationally for a new head, thereby bringing in some new blood, but already the heady days of the sixties were waning and funds were getting tighter than they had been.)

So now I had to get approval for overseas absences from the Director (then John Carver), rather than Le Couteur. With some trepidation I went to him and asked if I could leave within a few days, and then stay in England until July. He agreed straight away, for which I was grateful, and I was able to attend Dad's funeral in Saint Michael's Anglican Church in Kirby-le-Soken. He was buried in the church-yard.

I stayed with Mum for a month, then visited Jean-Marie Maillard in Paris before returning to England and attending the conference in Durham.

On Saint Patrick's Day 1987 in New York I was awarded

the Dannie Heinemann Prize by the American Physical Society. It seemed the whole of New York had turned out, but it was for Saint Patrick rather than myself. A number of my friends were there, including John Barnes, who'd been a fellow undergraduate with me in Trinity College, and Barry McCoy.

Jacques Perk and his wife Helen Au-Yang visited me in Canberra in November. They and Barry McCoy and others at Stony Brook had been looking at a new "chiral Potts model", where spins sat on the sites of the two-dimensional lattice and each spin could take N values. (For $N = 2$ this model reduced to the Ising model that had been solved by Onsager in 1944.) For $N = 3$ or 4 they'd found cases that satisfied the star-triangle (or Yang-Baxter) relation. Together we generalized these cases to arbitrary N . It was the start of a series of many papers, as this model proved to be more difficult than those previously found.

The doctors seem to have done a good job on my vocal chords, but from 1980 on I started to have a very occasional chest pain. This culminated in a severe pain in January 1988, when I woke up to go to the first morning of an international summer school in statistical mechanics at the ANU, for which I was the chief organiser. Elizabeth took me to the Canberra Hospital (then at its old location by Lake Burley Griffin), and I was in the coronary care ward for a week. The doctors found a severe blockage in a major artery and in May I was operated on in Saint Vincent's Hospital in Sydney. Again, the doctors seem to have done a good job, for which I am very grateful.

I was invited by the Japanese mathematical physicists Tetsuji Miwa and Michio Jimbo to a conference near Kyoto in October 1988. I discussed with my doctors and with Elizabeth whether it was sensible for me to go in view of

my recent surgery and we decided I should, but I should insist on having a rest after lunch each day. Miwa and Jimbo were good about arranging this and I enjoyed the conference, meeting once again with my colleagues Barry McCoy, Jacques Perk, Hector de Vega, John Cardy and Alexander Zamolodchikov. In his book “Small World”, David Lodge describing a group of academics who keep meeting at different places all over the world, and I could see what he was getting at! My subject of statistical mechanics was changing, perhaps partly because of the influence of Miwa and Jimbo (and myself), becoming more oriented towards the intriguing mathematics that was to be found in it, and less towards direct physical implications.



Kyoto 1988

John Cardy, Rodney, Michio Jimbo and Tetsuji Miwa

The ANU was divided into a research side (the In-

stitute) and a teaching side (the Faculties) and I was in the Institute. About 1988 the mathematics department in the Institute, which was immediately above the theoretical physics department, decided to move to a common location with the one in the Faculties. I was unhappy to lose the proximity of the mathematicians, so secured a joint appointment with mathematics and an office in the new location. In 1989 the combined mathematics school hosted a “Special Year of Mathematical Physics”, and many of my colleagues came from overseas, including Jaques Perk and Helen Au-Yang (by then at Oklahoma), Jim McGuire from Florida, Andreas Klümper from Germany, Vincent Pasquier from France and Tetsuji Miwa and Michio Jimbo from Japan, Murray Batchelor (who was then based in Melbourne) and Vladimir Bazhanov from Russia. Both Bazhanov and Batchelor joined the academic staff of the ANU shortly afterwards and have been valued colleagues of mine ever since.

My mother died peacefully in a home near Frinton in June 1989. I didn't go to the funeral: the long flight was daunting and I had the comfort of knowing that I'd seen her only eight months earlier, when I'd gone to England after the conference in Japan. I knew there would be many of the family there. She was cremated and her ashes buried in my father's grave at Saint Michael's parish church in Kirby-le-Soken.

I was invited to various conferences in the 1980's and 1990's. In August 1990 I was invited to two: the Fourth Asia-Pacific Pacific Physics Conference in Seoul, Korea and immediately following that was the International Congress of Mathematicians in Kyoto, Japan. I went there via Hong Kong, where I stayed three nights in the British Army Nurses' Home, where my niece Jackie was living: she'd joined the Queen Alexandra's Nursing Corps and had been

posted to Hong Kong, which I think she greatly enjoyed. She'd taken what seemed to me to be an irrational aversion to a British doctor who was also staying there, telling me on my first day that amongst his many alleged failings he ate kippers for breakfast. I made a mental note not to have kippers, which was something of a sacrifice as I enjoy a good pair of kippers!



The Yangs and the Baxters, Canberra, January 1992

Chen Ning & Chih Li Yang with Rodney and Elizabeth
in our living room

I think it was on that visit to Hong Kong that I attended Mass and heard what I still think is a good joke told from the pulpit: "A parish priest was leaving to go on to another parish. An elderly male parishioner said ruefully to him that he'd be sorry to see him go and that the new priest wouldn't be as good. The departing priest attempted to

reassure him by saying that his replacement may well be better than he himself had been. The old man shook his head sadly and replied ‘No, Father, I’ve seen five priests come and go, and each one has been worse than the one before.’”

My work had found applications outside statistical mechanics. Vaughan Jones was a New Zealand mathematician who’d moved to the USA and he’d been able to apply my ideas so as to obtain a new invariant in the mathematical theory of knots. He’d contacted me and the two of us got on well together, often having a drink together when we met. Apparently Alfred Nobel’s wife left him for a mathematician, and as a result there is no Nobel Prize in Mathematics. The nearest thing to it is the Fields Medal, and Vaughan Jones was awarded that at the International Congress of Mathematicians at the end of August. I was pleased to be present.

C.N. Yang and his wife Chi-Li came to Canberra in February 1992. Elizabeth and I had them to dinner at our house in Reid, along with several other guests (including Bazhanov and Batchelor). The next day Elizabeth and I set off by car with Ann to drive to the University of New England (UNE) in Armidale in northern New South Wales. Ann had been interested in studying marine biology (I rather wonder if she hoped it would lead to a life snorkelling off the Barrier Reef). The obvious place for that was James Cook University in north Queensland, but that was a long way away, so we compromised with UNE, which had courses on environmental studies. We arrived on the Sunday, where Ann had a room assigned for her in Duval College, and went to Mass in the evening at Saint Albert’s College. There was a social event later for the new students. We took Ann along to it, where she waved us goodbye and started her undergraduate life.

3.4 Cambridge 1992

I arrived in July 1992 at Trinity College, Cambridge as a Royal Society Research Professor. I went for three months as the first step in what was intended to be a permanent move back to England.

I was given rooms over the entrance to Whewell's Court, directly opposite the main gate into Trinity. I was assigned an office in the Department of Applied Mathematics and Theoretical Physics (DAMTP) in Trumpington Street, where Stephen Hawking also had an office. However, I found the building rather depressing - an old barn of a place, rather empty during the vacation, so instead spent my time at the Isaac Newton Institute, a new building which even in the vacation was busy with visiting researchers and conferences.

Jean-Marie Maillard had organised a conference at the Université Pierre et Marie Curie in Paris in July, with the remarkable title "Yang-Baxter Equations in Paris", so I took the hovercraft across the Channel and attended the meeting. Then in September I attended a physics conference in Como, at the southern end of Lake Como in northern Italy. In October I left Cambridge to return home. I went via Hawaii, where Elizabeth joined me and we had a pleasant short holiday at the King Kamehameha Hotel in Kona.

I'd enjoyed my stay in Cambridge, but felt that there were many arguments against moving there permanently, particularly from a family point of view. Ann and Andrew would probably stay in Australia, so we would become separated from them and from Elizabeth's relatives, and I disliked the long flight from England to Australia. With some regret, I wrote to the Royal Society saying I would not be taking up my Research Professorship.

3.5 Norway, Oceania and the USA 1993 - 1996

In May 1993 I attended a physics conference in Trondheim in honour of their alumnus Lars Onsager. Lars himself had died in 1976, but his son was there, looking very much like a younger Lars, along with many of my colleagues, notably Elliott Lieb, Joel Lebowitz, Michael Fisher, George Stell and John Nagle. For once I didn't take the opportunity to visit England. Dad had died in 1986 and Mum in 1989, so the main reason to do so was no longer there.



Elliott Lieb at the Trondheim meeting in 1993

Elizabeth was working in the Law School at the A.N.U. and attended a law conference in Christchurch, New Zealand, in October. I went with her as an “accompanying person”. This was a new experience for me and I was intrigued how



Trondheim 1993

Front row: Rodney, John Nagle, Elliott Lieb, Joel Lebowitz, Harold Friedman, George Stell, Michael Fisher.

Lars Onsager's son is the tall balding man at the top, three in from the left.

it would work out - would I be invited to tea and cucumber sandwiches with the Governor's wife, along with the ladies? I was a bit disappointed that there was no such invitation - maybe lawyers don't go in for accompanying person's programs.

After the conference we rented a car from Hertz and set off on a drive round the South Island. At Milford Sound it was pouring with rain (it has an average annual rainfall of 6.8 metres, something the tourist brochures don't stress). When we went to leave we found we were cut off by a

huge land-slide that had covered a kilometre or so of the one and only road. (If we'd been a few minutes earlier we would have been underneath it.) We stayed the night at a backpacker's lodge and the next day were helicoptered out. Hertz were good - they just told us to leave the keys with the manager of the backpacker's and pick up a car at the next town. For other people, such as the couple who'd rented a campervan from a small operator, it must have been the end of their holiday.

I'd been chosen to receive the Massey Medal of the Australian Institute of Physics at their meeting at Griffith University in Brisbane in July 1994, so we flew up there and afterwards took the opportunity for a four-day cruise of the Barrier Reef. It was a wonderful experience, during which I learned to snorkel under the watchful eyes of the crew. I am not much of a swimmer, but I felt quite comfortable floating on the surface and looking into the brilliantly coloured world of coral and fish below the surface.

The boat called at Cooktown, the remote place where Captain Cook repaired his damaged ship, and which was the setting-off point of a late 19th century gold rush. In the 19th century the town had a thriving Chinese community, which was treated as alien and kept very separate from the European. However, there was one way in which the two communities were clearly alike. In the town's museum were preserved decorated tea-sets of both groups, which they'd each brought there as a comfort from their home civilisations. They were remarkably similar and obviously served the same purpose, the most significant difference being that the Chinese teacups did not have handles.

In June 1995 Elizabeth and I had a wonderful holiday in Samoa. I'd glimpsed American Samoa a few years earlier on a refuelling stop on a plane from the USA to Australia,

and had liked it, so we went for almost three weeks. We stayed at Aggie Grey's Hotel in Apia in Western Samoa, at the Rainmaker Hotel in Pago Pago in American Samoa, and at the Safua Hotel (a simple hotel where you slept in your own "fale" - a little hut) on Savaii. It was a lovely experience - not far removed from R.L.Stevenson's descriptions of life in the Pacific Islands.

I saw more of the Polynesians next January at a maths summer school organised by Vaughan Jones in Tolaga Bay, a Maori community on the west coast of the North Island of New Zealand. I gave some lectures there and met once more Miwa and Jimbo, as well as Peter Goddard from Cambridge. Ruth Lawrence, who'd entered Oxford at the age of twelve, was there with her father.

The summer school was a triumph of organisation as the town didn't run to fancy hotels, just one pub, a motel and a campground. Many of the participants were in tents at the campground, I shared a two-bedroom suite at the motel with Peter Goddard and his wife. All meals were provided in the community hall, cooked by the local ladies. Some of us would gather in the pub in the evening: the whole event was unconventional and very enjoyable.

We were in Boston once more from February to June 1996. We went via Chicago, where we saw my goddaughter Meriel Owen (the daughter of Julian Owen, the best man at the wedding of Elizabeth and myself). I was visiting Fred Wu at Northeastern University.

We'd contacted our old friends Tad and Val Evans from Boston in 1968 -1970 and they'd offered to rent us their house in the suburb of Arlington. The north-east of the U.S.A. has a fairly extreme climate - it can be very cold in winter, and unpleasantly hot and sticky in summer. It had snowed when we moved into their house on the Friday. On Saturday I noticed that Tad's car papers seemed to imply



Shovelling snow in Boston 1996

that we would not be insured if we drove their car. I was unable to check this out immediately, so on the Sunday morning we decided to walk to mass at the nearby catholic church. It was hard going through the snow and we were pleased when a church hove into view. Unfortunately it was not the catholic church, so we kept going. As we walked Elizabeth, who was getting weary, said “we’ll go into the next one what ever it is”. It was in fact the catholic church, but as I said to her afterwards, that day could have been the one when we became Plymouth Brethren! I phoned Tad later that day and he assured me that we would be insured, so we could have driven.

While in Boston we drove to Rutgers (near Princeton) and I attended a statistical mechanics meeting organised

by Joel Lebowitz. Joel had moved to Rutgers, so his Yeshiva meetings had become the Rutgers meetings. They continued to be an important place to go to keep abreast of current developments in statistical mechanics. My sister Eileen and her husband Alf had crossed the Atlantic and were with an organised tour, so on our way back to Boston we surprised them by looking them up at their Manhattan hotel. A few days later they came as arranged to visit us in Arlington. At the end of our time in Boston we made a car tour round Nova Scotia in Canada. We went via Maine, where we visited Baxter State Park, named after Governor Percival P. Baxter, who gave the land to the state between 1931 and 1962. Unfortunately I know of no relationship between myself and Percival, but I did hope that we'd attract at least an interested comment when we signed the visitors' book. Alas, no comment was forthcoming. We walked a little way through the park along a well-defined trail and were startled at one point when a large moose crossed the path a few yards ahead of us.

Leaving Maine, we crossed into Canada and looked up on the way my old friend Walter Learning, whom I'd known as a research student and research fellow at the ANU from 1961 to 1968. He'd continued his acting career and was then Director of Theatre New Brunswick in Fredericton.

We left Boston on 11 July and had five days in San Francisco: we went to Mass on the Sunday at the beautiful Old Saint Mary's Church, which was the first cathedral of California. We also rented a car and drove to the wineries of the Napa Valley before boarding the plane and returning once again to Canberra.

3.6 Canberra, Malaysia and the USA 1996 - 2002

We didn't do much travelling for the rest of 1996. Martin Dunwoody and I had parted company when we returned to England on the Willem Rys ship in October 1964. Since then he had married and become a mathematics professor at the University of Southampton. Although I'd been to England many times, I'd never made it down to the south coast to see him again, so I was delighted when he visited us in Canberra in early November with his wife Jean and their two sons. On a later occasion we also saw Martin and his wife in Melbourne, where he'd rented a house in Carlton and was visiting Melbourne University. We finally visited them in their Southampton home in 2016.

In November 1996 we celebrated Andrew's 21st birthday. A large tent was erected in the garden. Andrew had made some good and likeable friends at Daramalan School, and many of them were at the party, along with neighbours and relatives.

In May 1997 Elizabeth and I drove up to Armidale to see Ann, who had graduated at the University of New England in 1996, while Elizabeth and I were in Boston. She was now working on a Masters degree in Natural Resources. We stayed a couple of nights in Dubbo en route, taking the opportunity to see the Dubbo Zoo, a quite spacious zoo that gives the animals a more natural environment in which to live. Amongst other animals, we saw elephants, hippos and camels.

Ann took us to see the Wollombi Falls, in the Great Dividing Range east of Armidale. Her master's degree work was studying the impact of feral goats on native vegetation in the National Parks, working with a park ranger. Two small sections of park were studied. One of them was

fenced against goats, the other was not. The expectation was that the native vegetation in the first would do better, but in fact they observed the opposite - that in the second did better than that in the first. I was pleased to observe that there was no attempt to disguise this, rather the conclusion was that the goats preferentially ate the weeds, which gave the native vegetation greater space in which to grow. A good example that one should not pre-judge experiments!

Similarly to Andrew, Ann had made good friends at school in Merici College, and had kept in touch with them. One was Kim Hamdorf, who had enrolled at the University of New England at the same time as Ann, others were Ruth Dillon and Caroline Pampling, who had stayed in Canberra. Ruth married in June 1997, so Ann and her boy-friend Christopher Eggert came to Canberra for the occasion. Caroline was also a guest, so Ann was able to see two of her old school friends again.

There was a kind of jamboree of back-to-back conferences on statistical mechanics in July 1997. The first was in Kuala Lumpur, at which I'd been invited to speak by the organisers. From there we flew to Brisbane, where the main meeting of the jamboree was at the University of Queensland in Saint Lucia. We stayed in the city and travelled to and fro the University by the river ferry - a pleasant way to commute. It was an international meeting and many of my colleagues from overseas were there: Barry McCoy and Vladimir Korepin from Stony Brook, Fred Wu from Boston, and A.B. Zamolodchikov from Rutgers.

The Brisbane meeting was followed by one in Coolangatta, and then by a smaller one in Canberra - four meetings in a row! I have a photo taken in Coolangatta showing amongst the overseas participants Barry McCoy, Vladimir Korepin, Fred Wu, Angela Foerster (from Brazil), Helen

and Jacques Perk, Andreas Klümper, Douglas Abraham. Australian participants (some of them organisers) included Tony Guttman, Paul Pearce, Alan Carey, Peter Forrester, Alex Owczarek and of course myself.

Our suburb of Reid was becoming more gentrified. We still had the original driveway of rough gravel and the side of the house near Currong Street was a bit of a wilderness, containing a primitive wooden shed that we used to store bits and pieces. As a little girl Ann had christened the shed “the mincer boy’s house”. We never knew who the imaginary mincer boy was meant to be, but the name stuck. The gravel drive was a bit of a nuisance as it meant we were forever walking gravel into the house. The neighbours seemed to be keen on having brick paths and drives, but we worried that would mean constant weeding. Neither bitumen nor plain concrete appealed, but on our way home from Sydney recently, we’d stopped at the tourist information centre in Mittagong and liked the look of their car park of “Bomanite”, which was concrete, stamped and coloured to look like rock.

So in May 1998 we had a Bomanite driveway put in, the mincer’s boy’s house removed, and the Currong Street side cleared and good soil put in. My brother Dennis used to say ruefully that when he had a job done he’d do it himself, while our mother had got to the stage that she’d call in “an army of workmen”. I felt we were perhaps moving on to that stage ourselves! Anyway, we liked the result, and had a new, larger and smarter shed put in, which we continued to call “the mincer boy’s house”.

From January to May 1999 I was a visiting Miller Professor in the mathematics department of the University of California at Berkeley. It was Vaughan Jones’s base and I was able to use his office. Elizabeth was then employed as a tutor for the aboriginal students in the ANU

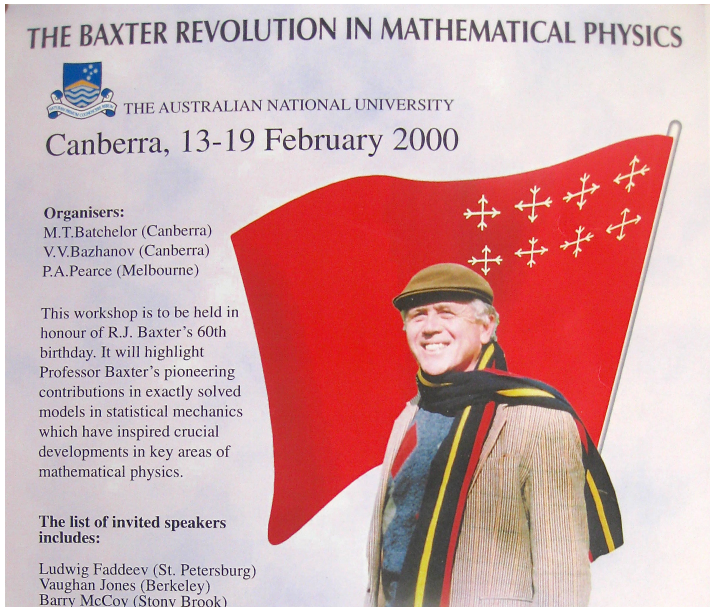
law school - a job that she obviously enjoyed, despite its hassles. She came with me to Berkeley, where we rented a two-bedroom flat, but she had to leave in February to return to tutoring. Eileen and Alf came over from England later and I was able to show them Yosemite National Park and the Napa Valley wineries.

At the end of 1999 our daughter Ann married Christopher Eggert in Wauchope, where Chris's family had a dairy farm. Eileen and Alf were becoming globe-trotters, for they made their second inter-continental trip that year and flew to Australia to attend the wedding.

The eighth of February 2000 was my 60th birthday. Elizabeth organised a celebration on the preceding Friday, starting with pre-dinner drinks at home. Many of our friends and relations were present: Ann and Chris, Elizabeth's brother David and his wife Judy, and Jim McGuire, as well as Bob Watts, Julian Owen, Vladimir Bazhanov, Murray Batchelor and their wives. Elizabeth had gone to a lot of trouble to make some large posters with photos showing various aspects of my life: a schoolboy at Bancroft's, an undergraduate at Cambridge, a research student at University House, skippering boats on the Hawkesbury and Shannon rivers, acting in plays, touring, receiving awards, going up the aisle with Ann at her wedding, etc! The posters were on display in our hallway.

A week or so later a big international conference began at the ANU in my honour entitled "The Baxter Revolution in Mathematical Physics". It had been organised by Bazhanov, Batchelor and others. When Vladimir had told me of the proposed title I'd been greatly amused and had a photograph taken of me wearing a cloth cap and my scarf from Trinity College, Cambridge. The conference poster was this photograph with a large red flag as background. In the upper corner of the flag was not the hammer and

sickle, but eight crosses representing the eight vertices of the eight-vertex model that I had solved in 1970.



Poster for the “Baxter Revolution” meeting

It was a big meeting, with at least 68 participants. Many of the academics I’ve mentioned were there, including Fred Wu from Boston. At my suggestion, the conference dinner was at the Gundaroo pub: we boarded a bus which took us to Gundaroo, a village 37 kilometres from Canberra, where the old pub had been reopened as a rather rustic function centre. We all had a pub-style dinner and afterwards there was dancing, which was led by Elizabeth and myself. It was refreshingly different from the more usual big conference dinner at a five-star hotel.

Elizabeth retired at the end of 2000. She was farewelled by her Aboriginal students at a lunch in the Fellows’ Garden of University House in December. The next day we

both attended the Law Faculty Christmas Dinner at the ANU's Mount Stromlo Observatory where she and three other staff members were more formally farewelled. Naturally she had mixed feelings about retirement - she'd enjoyed her work, particularly as tutor to the Aboriginal students, most of whom she'd found friendly and appreciative. On the other hand, it would be good to have more free time, and it would be easier to accompany me on overseas trips.

The next big event was that Elizabeth turned 60 in August 2002. I organised a get-together of significant family and friends in Sydney, with a dinner at Doyle's restaurant at Watson's Bay and a boat excursion on Sydney Harbour. It was a bit like organising a conference: getting and keeping in touch with the participants, booking rooms at a hotel, restaurant, excursion, etc.

Ann gave birth to a boy, Lachlan Eggert, in November 2002. We drove up to Wauchope in time for the arrival of our first grandchild, and were able to be of some help in what was naturally a very busy time. Ann had married into a close-knit family. Her parents-in-law, Paul and Jenny Eggert, ran the dairy farm with Chris. They milked about 160 cows, twice a day, 365 days a year (366 in leap years). They'd taken a decision some time before to go organic, which would give them a better price for their milk, and it was beginning to pay off. The farm was looking greener and the vet bills were down. Chris and Ann were becoming quite evangelical about organic farming, appearing in the newspapers, on radio and TV to promote its benefits.

Chapter 4

“Retirement”

4.1 Australia 2002 - 2005

My father had retired from the bank two or three years early and seemed to have enjoyed the first years of his retirement. I decided his was a good example to follow: I'd been employed pretty continuously since leaving Cambridge and had built up a significant credit in the ANU superannuation scheme that would mean I wouldn't be any worse off retired than working. I didn't intend to stop doing my sums (a phrase I'd learnt from Professor Le Coureur), but I felt I'd prefer to do so without academic responsibilities such as having to attend committee meetings. Also, the ANU had recently joined the Australian Research Council grants scheme and it was obvious that if I stayed on the pay roll there would be enormous pressure on me to make grant applications. It wasn't a prospect that I looked forward to because of the time and mental energy involved. In fact I'd returned to the ANU in 1970 to get away from having to make grant applications.

So I retired in November 2002. For a couple of weeks I kept both of my ANU offices, in physics and in mathematics. Then I decided this was silly, as I intended to work mostly at home. The maths office was close to the University Union and shops, and to the Canberra Civic Centre and closer to my home. I had not enjoyed being head of

theoretical physics, feeling that the job had been thrust on me. It had been a very stressful time. Maths was free of these connotations. I cleared out my physics office. From then on I was in mathematics, the subject I'd studied and enjoyed as an undergraduate.

On 18th January 2003 Canberra was hit by a massive bush fire that had been burning in the forests in adjacent areas of New South Wales. With almost no warning, it swept through the pine plantations in the Australian Capital Territory and burnt three or so streets of adjacent houses in Weston Creek. It didn't get near us, but the sky was an eerie silvery colour. There was a strong smell of gum smoke and charred gum leaves fell in our garden. One story we heard was of a couple who had set out to drive to a reserve inside the pine forests and were stopped by a policeman. He asked them where they were going. They replied "to a barbeque", to which he immediately retorted "No, you're not"! It would probably have been suicidal.

Feeling I needed another interest, I'd been attending part-time some lectures on church history at Saint Mark's, Canberra. This was an Anglican theological school which had become a section of Charles Sturt University (a regional Australian university based in Wagga Wagga). I acquired enough credits to qualify for a graduate diploma, so in June 2004 I attended (with Elizabeth) a graduation ceremony and acquired a somewhat different academic qualification from my previous ones. My first degrees had been a BA and an MA (Cambridge didn't have BSc's), so the only degree I have that is explicitly scientific is my Cambridge ScD of 1984.

In October/November 2004 Elizabeth and I made a car trip to Adelaide in South Australia. (It was the second time we'd driven to Adelaide together, the first being in 1989 with Ann and Andrew.) Although we've travelled the

world, we rarely do long car trips. This was one - we took three weeks and stayed in many different places. On the first stop in a motel in Griffith in mid-western New South Wales, the couple in the next unit told us we'd joined the "grey nomads". It probably wasn't true. We've certainly never set off with a caravan to spend months touring the outback, which is what I think would really qualify you for the title.

We stopped in Broken Hill, once famous for its copper and silver mines, which were then very much under union control. I'd last visited in 1962 as a PhD student with Martin Dunwoody and another mathematician. On that occasion we tried to book into a motel, but the proprietress took one look at we three dusty young men and said she was full. We stayed at a pub. Now the mining is mostly done by machine and Broken Hill has gained a reputation for art, being the home of the bush painters, who portray the stark scenery of the area. We went to the Maclaren Vale wine-growing area south of Adelaide, and visited Ballarat, Bendigo and Echuca in Victoria.

In between trips I was still doing my sums. In 1988 Jacques Perk, Helen Au-Yang and myself had defined the case of the chiral Potts model (as a model in statistical mechanics) that satisfied the star-triangle relations. That year I'd gone on to obtain implicit equations for the free energy, and in 1990 I'd obtained a more explicit result. Until 2005 no one had derived the spontaneous magnetization (the order parameter).

In 1989 Albertini, McCoy, Perk and Tang at Stony Brook had made a very elegant conjecture for the spontaneous magnetization of the chiral Potts model, but it had remained a conjecture for the last 16 years. As noted above, order parameters are not easy - it had taken Onsager five years from obtaining the free energy of the Ising model to

obtaining the spontaneous magnetization - but 16 years is a long while.

I'd already obtained functional equations for a generalization of the spontaneous magnetization, but one needed to make an assumption that a function was analytic on a Riemann surface to complete the equations. I had no idea what the surface or the assumption was, and how to solve the equations if I did. However, in late 2004 I realised that it was not necessary to solve the equations in general - to obtain the spontaneous magnetization it was sufficient to solve a particular case, rather like the special "superintegrable" case of the chiral Potts model. That was much easier - I was able to present a plausible (but not rigorous) argument that the restricted function was analytic in a certain domain, and that was sufficient to solve the equations by a Wiener-Hopf factorization. Finally I obtained the result that Albertini et al had conjectured in 1989. I published the work in early 2005.

Not long afterwards I met Erich Weigold, who had been director of the Research School of Physical Sciences when I retired, and had alerted me to an ANU redundancy scheme which made it practicable for me to leave the payroll. He congratulated me on my latest piece of work and I thanked him for giving me the time in which to do it. Time to think is the most valuable asset of a researcher - at least it was for me.

In January 2005 we set off for New Zealand. There was an applied maths conference in Napier. For once I wasn't invited, but I decided to go anyway and make a holiday of it. We stopped at Rotorua, where one's first reaction is that there's a problem with the sewers, but then realises that the smell is that of the numerous geysers in the area giving off hot water and sulphur dioxide. We saw a boiling mud pool - see one and you've seen them all! (Somebody's

bound to criticize me for that.)

Napier was interesting. There was an earthquake there in 1931 and the city centre had to be rebuilt. It was done in the current art deco style, which has earned Napier the title of “the art deco capital of the world”. There are many good wineries in the area.

In July we went to a conference “Counting Complexity” in honour of Tony Guttman on Dunk Island, off the north Queensland coast and not far from Cairns. This time I was invited and gave a talk. We went from Brisbane to Cairns by train, travelling “Queenslander Class” on the Sunlander. It took 36 hours and was quite luxurious: 28 or so passengers had two sleeping cars, a lounge car and a dining car to themselves. Meals were included and were good; the other passengers were interesting. It was one of our best rail trips.

In September I was invited to another conference: the Australian Mathematical Society meeting in Perth, Western Australia. After it was over we drove down to Margaret River, a flourishing wine-growing area south of Perth. Then we drove back and boarded the Indian Pacific train all the way to Sydney. This was a three-day rail trip - the longest we’ve ever had. It was good to sit back and watch the Nullarbor pass by from the comfort of the train. It wasn’t just a sandy desert - it has quite a bit of salt bush and low scrub, but very few trees. Nullarbor is not an Aboriginal word, rather a classical Latin one: nullus arbor - no trees!

4.2 Norway, Australia and Italy 2006 - 2011

In early 2006 I received the news that I had won two separate awards: the 2006 Onsager Prize of the American Physical Society and the Onsager Lectureship and Medal

for 2006 from the Norwegian University of Science and Technology.

The American Physical Society prize was awarded in March 2006: I was unable to attend in person, but the donor of the prize, Ross Donnelly and his wife came to Canberra in October 2007, so I was able to see them and express my appreciation then.

I did attend the Norwegian award presentation in May. It was a lovely trip - Elizabeth and I went first to Oxford, where we stayed at New College and saw David Sherrington and John Cardy. We were also able to catch up with Val and Tad Evans from our Boston days, as they were then in England and were able to get to Oxford. We then flew to Trondheim, where I gave a talk and received the award, and we were taken to an excellent dinner. A day or so later was the Norwegian National Day and we saw something of the happy celebrations. Local bands played and people marched in their traditional costume (different for different Norwegian valleys). From Trondheim we took the Hurtigruten ship to Bergen, where we visited Helge Tverberg of the mathematics department (we'd met him and his wife in Canberra, when they had attended the wedding of his nephew to the daughter of a friend of ours). We couldn't miss the opportunity to explore the fjords, so we went by boat up the Sognefjorden to Balestrand and Flåm. From there we took the scenic Flåm-Mydal railway, then went by regular train across the mountains to Oslo

In Paris we saw Jean-Marie Maillard and Paul Pearce, who was also visiting Jean-Marie. We stayed at the Hôtel des Grandes Ecoles, a charming hotel to which we'd been introduced on a previous visit by Jean-Marie. We then went back to England to see my family. My brother Dennis told me he'd been diagnosed with stomach cancer and an operation was planned. My sister looked very frail.

Back in Australia, Kenneth and Enid Le Couteur celebrated Enid's 80th birthday at the Canberra Hyatt Hotel in October 2006. Their three daughters had organised the event, and many of the members and ex-members of the Theoretical Physics Department were present.

My brother Dennis died in England at the end of November immediately after his surgery. He was seven years older than I, but still only 73 - it was a wake-up call for me, a reminder of my own mortality.

I had been interested in Australian country railways for some time. Their closures were continuing apace and I wanted to travel on as many as I could while they were still open, so in June 2007 Elizabeth and I went on a rail trip with the Canberra branch of the Australian Railways Historical Society. We had our own train, with sleeping compartments, and went via Sydney and the Blue Mountains to Mudgee. The line to Mudgee was closed soon afterwards, so we were the last passenger train into the station and were greeted by a small crowd of enthusiasts with a band playing. From Mudgee we went to Dubbo, then on to Parkes, Cootamundra, Goulburn and Canberra - a very enjoyable three days.

We made the rail trip from Darwin to Adelaide on the famous Ghan train in June 2008, but first visited the Kakadu National Park. We were in Batchelor (south of Darwin) on Sunday 22 June, which was our 40th wedding anniversary. We had a blessing from the priest at Mass in the morning, and another at the Batchelor hotel in the evening from the band, who played the anniversary waltz for us!

From Adelaide we took the Overland train to Melbourne, so we had then been on all the Australian long-distance trains run by Great Southern Rail, as well as the Sunlander from Brisbane to Cairns.



Commonwealth Park, Canberra, Christmas 2008

Elizabeth, Rodney, Helen Au-Yang, Barry McCoy

Barry McCoy and his wife Martha had had a residency at the Rockefeller Foundation's centre in Bellagio in 2007. They loved it and advised me to apply for a residency. If accepted, one spent four weeks in Bellagio working on a project. The accommodation was in a large villa with wonderful views of Lake Como and the mountains. The large estate had been left to the Rockefeller Foundation by an American heiress who had married an Italian prince. It's a stunningly beautiful site and a marvellous place to work without interruption. There are usually 16 or so residents from the humanities, international affairs and the sciences. Everyone eats together in the dining room, and one is en-

couraged to give a short talk to the other residents on what one is working on (or at least the general background).

My application was accepted and Elizabeth and I were there from 16 March to 13 April 2009. Bellagio is on a peninsula between two arms of Lake Como, so the easiest way to get anywhere is by ferry. We went to Como a couple of times and explored Bellagio and the villages across the water. Most days I worked on a paper I was writing on the superintegrable chiral Potts model. I feel that this break greatly helped my recovery from a carotid artery operation I'd had the previous December. We loved Bellagio, and are forever grateful to Barry and Martha for their suggestion.

Afterwards we went to France, where we visited my nephew Neil (one of Eileen's children) and his family in Grenoble. We then went via the Dordogne to Paris and England. We stayed in London at the Royal Society. At breakfast one morning another Fellow asked us where we were going when we left London. When I told him we were going to York he urged us to visit the National Railway Museum there. My first reaction was that we hadn't time, but we saw the museum when we arrived and did go in and were very glad we did. It is one of the great rail museums of the world and took me back to my childhood in the "Age of Steam". We returned to Canberra in June.

In January 2010 I received the sad news that my sister Eileen had died in Dorset. At first my reaction was that I couldn't make the long trip to the funeral. However, I reflected that I'd been to my father's funeral, but missed my mother's and brother's. This was the last of my immediate family, so I decided I should attend.

I did, and it obviously impressed the Anglican vicar who led the funeral service - he referred to the presence of "Uncle Rodney from Australia". I was certainly glad I went and was there with my cousins, nephew and nieces.

I left England on 8 February, so spent the evening of my seventieth birthday at Heathrow Airport. Elizabeth made that up for me after I got home with a family dinner at a local restaurant.

The 24th IUPAP Conference on Statistical Physics was held in Cairns in July 2010. I of course attended, as did Frank Yang and his young wife Weng Fan. Many of my colleagues were also there, including Jean-Marie Maillard, Barry McCoy, Jacques and Helen Perk, Douglas Abraham and Bernard Nienhuis. Some of them came on to Canberra afterwards.

My Cambridge friend John Barnes and his wife Bobby came to Australia and visited us in Canberra - we'd visited them many times when we were in England. They only had a few days, so when they left Canberra by car, we went with them as passengers as far as Wagga Wagga so as to have another 24 hours together. The next morning they drove off to Melbourne, while Elizabeth and I caught the train back to Canberra.

Our son Andrew married his partner Michelle in April 2011. They arranged to have the wedding at a winery in the Hunter Valley, near Newcastle, New South Wales. The wedding was in the open air and some of the cars passing on the nearby road gave a little toot. At first I was a bit irritated, but then I remembered that I'd been brought up to believe weddings should be a public affair - this was certainly public!

Kenneth Le Couteur died later that month. The funeral was at Saint Luke's Anglican Church in Canberra and was something of a reunion of the members and ex-members of the theoretical physics department. I felt that it marked the end of an era - Kenneth had effectively brought me out to Australia and guided my career. Now he was gone. He was from Jersey in the Channel Islands and had been

in Cambridge when World War II broke out, so had stayed in England for the duration of the war. For many years he said that he'd worked during the war at the radar station at Malvern. In fact he did top-secret work at Bletchley Park, decoding the German messages sent via the Enigma machines. It remained top-secret until 1974: only then were the Bletchley Park workers allowed to talk publicly about what they had really done.

4.3 Singapore, Australia and England 2011 - 2012

In May 2011 a conference was held in Singapore in honour of the sixtieth birthday of Vladimir Korepin, a Russian physicist who'd moved to Stony Brook. I was invited, so Elizabeth and I went via Japan, where we saw Miyoko Nakano. Miyoko and Elizabeth had shared a house in Canberra before I'd met Elizabeth, and Miyoko had gone on to become a well-known expert on ancient Chinese language. We also saw Atsuo Kuniba in the physics department in Tokyo University. From Japan we flew to Shanghai, where we stayed with my nephew David (Eileen's oldest child, who was then working in China for his bank), then on to Singapore and the conference.

In August we went on an organised "Queensland out-back railway adventure". We flew to Townsville, where we met the rest of the group of 16 or so people. The tour then took us by rail to the mining town of Mount Isa, by air to Normanton in the Gulf country, then by a rail motor known as the "Gulflander" to Croydon, along a line that had been built when gold was found in the area. The engineer/driver was the son of a colleague of mine in the maths department at the ANU. From Croydon we were bussed to "Robin Hood Station" - a vast cattle station with

two air strips, where the carrying capacity is reckoned in acres per cow - not the other way round! Then we went to Forsyth, where we boarded another outback train - the "Savannahlander" - that took us through the Atherton Tablelands to Cairns.

In April 2012 we set off for an extended visit to the UK. We were able to connect once more with Val and Tad Evans, our old friends from our first Boston days, by all staying at the same hotel in London. We visited Oxford University (where we saw John Barnes) and finished up at the Royal Society, but most of the trip was holiday, seeing family and friends, with a railway theme. We went to north Wales, where we enjoyed riding the Ffestiniog railway, a narrow gauge railway built to carry the slate from the Welsh mountains to the Port of Porthmadog. It is now maintained by quite a large organisation, many of them enthusiastic amateurs, and must be quite a boon to the local economy. In Scotland we took the West Highland line to Fort William, the steam train to Mallaig, and the West Highland line back to Oban. As I mentioned earlier, the weather was perfect - blue skies and warm air. From there we took the Carlisle - Settle line to Leeds and went on to Peterborough, Colchester (where we saw my cousin Peter - the one who'd been in Malta in 1968) and back to London.

We were in London for the Queen's Diamond Jubilee, so saw something of the celebrations. Elizabeth's brother David was staying with his son and family at Kingston-on-Thames, so we went down there and joined in a street party. We returned home in June.



Royal Medal Celebration in University House, 2013

Xi-Wen Guan, Vladimir Bazhanov, Huan-Qiang Zhou,
Murray Batchelor, Vladimir Mangazeev, Rodney,
Elizabeth, Lioudmilla Bazhanov

4.4 Royal Medal 2013

In June 2013 a letter was waiting for me in the ANU maths school. I could see it was from the Royal Society, so put it in my pocket to open later, thinking it was a routine matter. When I did open it a couple of hours later I found it was to inform me that I'd been chosen for the 2013 Royal Medal in the natural sciences. It was to be awarded at the Anniversary Day meeting of the Society on 29 November. I had to keep quiet about it for a month or so, but when the news became public I was very pleasantly surprised by the number and warmth of the congratulations I received. We quickly decided we should go to the UK so I could

receive it in person, so at the beginning of November we flew via Hong Kong to England. We stayed the first night with John and Bobby Barnes, then John drove us to Cambridge, where we all visited John Polkinghorne, the director of studies for John Barnes and myself when we were undergraduates. That evening Elizabeth, John, Bobby and myself had dinner at high table in Trinity College.

Elizabeth and I then made a short tour round southern England, mostly in crisp Autumn sunshine, visiting relatives and friends. Our second last stop was in Oxford, where we stayed in All Soul's College and saw John Cardy (who'd nominated me for the Royal Medal) and Murray Batchelor (who had a visiting position there). We then went to London for the presentation at the Royal Society. John and Murray were there, as was my niece Jackie and her husband. Also in the company was Carol Brownson, our hostess in London, who'd also shared the Canberra house with Elizabeth and Miyoko. It was quite a family and friends occasion. Afterwards there was a big buffet dinner for the Society's Anniversary Day, the entertainment being a jazz band. The band was led by a Fellow of the Society and included a tall lady playing the trombone. It was good jazz - Elizabeth and I, and many others, danced to the music. We flew home a few days later.

We spent Christmas at home and both Ann and her family, and Andrew and his wife Michelle, came to us. The photograph below was taken in our living room on Christmas Day.

4.5 2014 -

We'd been to Shanghai for a few days in 2011 to visit my nephew David, and I'd been a number of times to Hong Kong, but I'd never made an academic visit to mainland



Christmas 2013

Elizabeth on left, Rodney on right; Andrew and his wife Michelle at left back; Ann and her three boys Jimmy (left), Billy (front), Lachlan (right)

China. I'd been apprehensive of doing so, fearful I'd say the wrong thing and end up in trouble with the authorities. However, Yupeng Wang, the director of the Physics Institute in Beijing of the Chinese Academy of Sciences, came to Canberra in late 2013 and urged me to visit his institute and give a lecture. Xi-Wen Guan, who'd worked in the ANU and was now in the Physics Institute in Wuhan, and Murray Batchelor, who had a joint appointment between the ANU and the University of Chongqing, also urged me to go.

So in April 2014 we flew, via Seoul, to Beijing, and I gave talks there, in Wuhan, and in Chongqing. We were very well looked after. I didn't get into trouble and we enjoyed our visit.

In 2015 my colleagues organised another conference in my honour - "Baxter 2015" in Palm Cove, north of Cairns in Queensland. Elizabeth and I greatly enjoyed seeing again many of the academics I'd interacted with over the years, including Jean-Marie Maillard, Andreas Klümper, George Andrews, Barry McCoy, Jim McGuire and Craig Tracey. We haven't finished travelling overseas - later in 2015 we flew to New Zealand and visited Joc Powell (John died in 2008) and Ruth and Bill Humphries, as well as travelling on the steam train "Passchendale Ab608" from Dunedin to Christchurch.

In 2016 we spent eight or so busy weeks on England, Wales and France. I'd come from a moderately musical family: my father in particular played the trombone and the tuba in the Leyton Silver Band, and sometimes played in the orchestra for amateur productions of the Gilbert and Sullivan light operas. As a result I'd always been fond of Gilbert and Sullivan, so we started our visit to England at the annual Gilbert and Sullivan Festival in Harrogate, Yorkshire. We watched eight of the operas in six days, before going on to see friends and relations. Towards the end of our stay we also saw a grand opera (Norma, by Bellini) at the Royal Opera House in Covent Garden.

We hope to attend a physics meeting in Amsterdam in September 2017.

So it's not been entirely "retirement", but we've enjoyed it and we've not stopped yet!

