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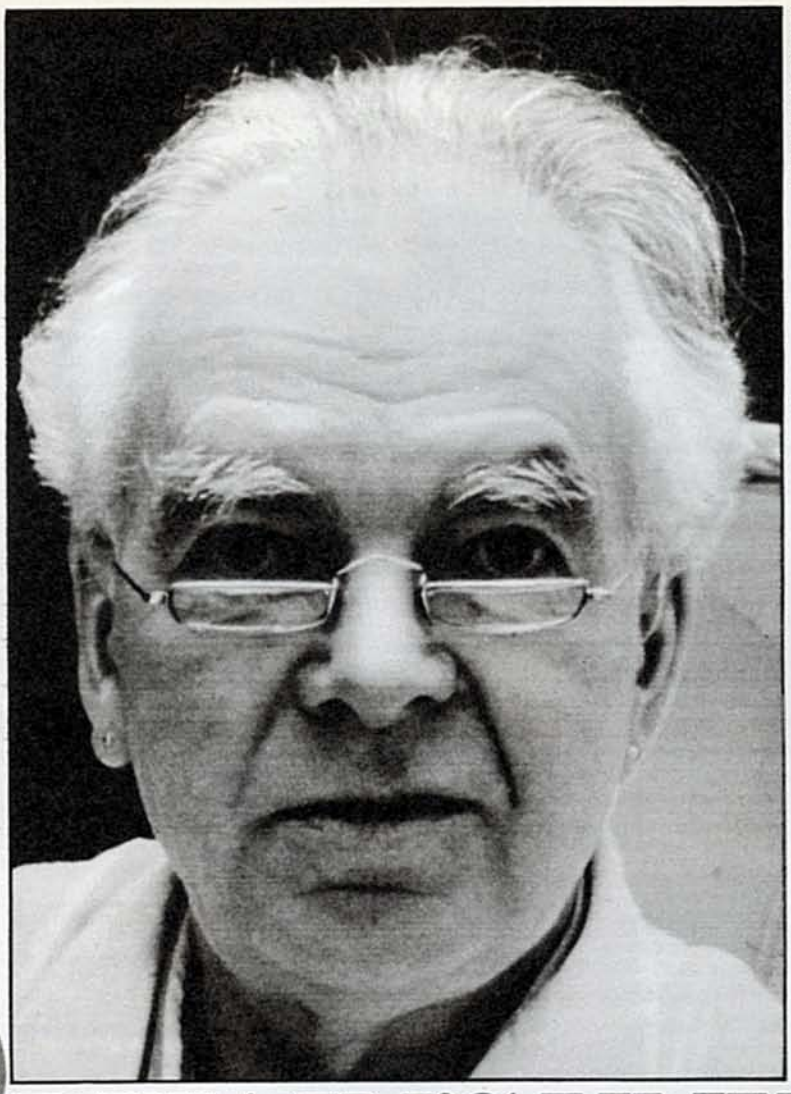
A TOUCH OF GLITTER FOR YOU TO KNIT

MEET A NOBEL PRIZEWINNER

THE QUEEN MOTHER'S CASTLE GARDEN

PETER SCOTT'S WILDFOWL SPECTACULAR

Dr Peter Mitchell, winner of the 1978 Nobel Prize for Chemistry



CONRAD HAFENRICHTER

He funds his own research institute, cherishes a pet donkey, mints his own silver pieces, and has a personal theory of inflation. He has never been profiled before, but agreed to see Robert K. G. Temple (author of The Sirius Mystery)

BRITAIN'S UNKNOWN NOBEL PRIZEWINNER

ONE OF Britain's most extraordinary intellectuals lives in near-seclusion in a remote wooded valley in Cornwall. In a small stately home which he reconstructed from a ruin with his own hands, Dr Peter Mitchell, winner of the 1978 Nobel Prize for Chemistry, presides quietly over a remarkable private world. Glynn House, a Regency mansion near Bodmin, is approached by a mile-long drive reminiscent of the entrance to Manderley in Daphne du Maurier's novel *Rebecca*. Mossy banks waving with ferns pour with constant moisture, massive rhododendrons and laurels blot out the sky, revealing glimpses of a dark and still lake surrounded by trees. As you reach the house an enormous English mastiff barks and threatens strangers.

The forbidding impression is misleading. The mastiff is inclined to run and hide under the table if looked at too intently, and loves nothing so much as a tummy-rub. A conversation with the esteemed Dr Mitchell may as likely as not be interrupted by the appearance at the window of his pet donkey, Zoë, stamping her foot and demanding an apple. The imposing Regency façade of the grand house turns out to conceal a biochemical laboratory with a staff dressed in white coats and the smell of rats who sacrifice themselves daily in the cause of science but are kept in pairs so that they don't get lonely. Even the killing of the rats is done with circumspection: "We wouldn't want a rat to die in vain," says one of the staff. They always make sure the experiment is going to go through before ordering the execution, which is done in order to study the "power-plants" of the cells in the rat livers. Dr Mitchell and his team have by such research revolutionised the field of biochemistry known as bioenergetics, all from the quiet depths of Cornwall.

EVEN THE KILLING OF THE LABORATORY RATS IS DONE THOUGHTFULLY

Peter Mitchell is an informal figure, with long white hair swept back, gold studs in his ears, and a prominent ring of ancient Minoan chalcedony on his hand. His voice is soothing, almost hypnotic, his manner reassuring, quiet, and above all friendly. All his life, he says, he has been almost entirely lacking in aggression, though, violently attacked on occasion for his theories. He remains convinced that if anyone is ever angry with him it is his, Mitchell's, fault.

Not that people often are. His scientific enemies over the past 20 years have mostly become his friends, and sometimes praise him embarrassingly. Mitchell reacts to this with genuine dismay. He hates having attention called to himself and loathes publicity of any kind. Receiving international acclaim with the award of the Nobel Prize was for him an almost unbearable ordeal. He has always been "an entirely private person", and has never before agreed to a profile being written.

What strikes one about Mitchell is his painstaking attention to the details of his work and his environment. In his previous house the donkey was able to come in and sleep on the kitchen floor in front of the Aga, but Glynn House has a kitchen floor too slippery for the donkey's hooves—so various compensatory arrangements had to be made. As Zoë could not be excluded from the family circle, a little house was built just outside, placed so that she could look in and watch the family at the dining table, or beyond in the kitchen. It is her habit to stand there observing them all and wiggling her ears at them. Unfortunately her head used to get wet in the rain as she continually stuck it out to look at them. So a little "porch" was built to keep her dry. When it proved too low and irritated her ears, a higher porch was built. Now she is happy.

HOW DID ORGANISMS IN A DILUTE OCEAN FIND WHAT THEY NEEDED?

Mrs Mitchell is a superb cook and proffers to all visitors delightful French dishes. Wine flows in abundance, often from bottles personally brought back from France. Around the living rooms of the house are many imposing objects: an antique repeating rifle with seven barrels, a huge mounted telescope pointing at the ceiling, enormous antique pharmaceutical jars, an ancient Chinese bronze "spouting bowl" (which is supposed to send up jets of water when rubbed, but doesn't). Two grand pianos have been dispensed with since Dr Mitchell had a tragic loss of hearing in a surgical accident, leaving him totally deaf in one ear and fairly deaf in the other. Although he lip-reads and can hear to some extent, his concentration is often disturbed by loud noises inside his head and the destruction of his sense of balance, so that whenever he turns his head all the visual images slew around like sea water.

What is so extraordinary 16 ☛

12 about Peter Mitchell's intellectual and scientific achievements? Dr Jennifer Moyle, his research associate for 32 years (in all that time she recalls only a single quarrel), begins the story in 1948 when they first worked together at Cambridge: "Peter was interested in how organisms, for example free-living bacteria, existing in a soup which to them is as big as the Pacific Ocean were able to collect from this very dilute soup the materials they needed to make more of themselves." This was a problem many of his colleagues refused to face or could not answer.

Even at that early stage of his career, his promise was evident to those who knew him. Dr Fred Sanger, one of only four people ever to win two Nobel Prizes (he shared the 1980 prize for chemistry), remembers: "Peter had an original idea on every subject and we all knew even then that he would possibly change science."

Mitchell tells with his usual mirth a story of how he and Sanger used to go ice-skating together on the frozen pools of the sewage farm outside Cambridge. Mitchell fell through the ice and, covered with sewage, had to drive all the way into Cambridge to wash it off. As he was being pulled out, Mitchell says, "Fred was awfully good—he didn't laugh!"

After leaving Cambridge, Mitchell and Jennifer Moyle went together to the University of Edinburgh, where he became Director of Research at the Chemical Biology Unit in the Department of Zoology. Both enjoyed the teaching, but pressures became too intense for him. He developed such serious gastric ulcers that doctors wanted to operate and remove four-fifths of his stomach. He refused, but was forced to leave.

He and his wife Helen found the Glynn Valley in Cornwall and decided to move there "with the idea of keeping in touch with the gentleness of spring", since Scotland had no spring to speak of.

It took them two years to rehabilitate the ruined Glynn House, acting as their own architects and ferrying in workers from distant Plymouth every day by bus. Four hundred gallons of anti-dry-rot fluid were required to save the 18

INFLATION MEANS WE PAY THE BANKS FOR BORROWING OUR MONEY . . .

Dr Mitchell, whose scientific work has centred on the transfer of energy within cells of living organisms, wants to extend his interests in energy-transfer to human society. He explains this extraordinary project: "In molecular biology one uses the function called *energy* to describe communication between the molecules. Usually we can say that the energy is conserved within the system we are looking at. This means that energy behaves a bit like an indestructible substance. In behavioural biology, there is a rather similar function, known as money. Money allows a relationship between one individual and another in the exchange of goods or activities, or services, and it has a very strong social function in connecting the individual with the society. And so it's very important that it should be conserved and used properly. If you have an inflationary situation, this is like a universe in which energy is no longer conserved. Imagine what would happen to the solar system if all of a sudden the principle of the conservation of energy broke down. It would fly to pieces. And I think that's not unlike what seems to happen in society."

Mitchell believes an urgent and profound re-examination of "human communication by means of money" is needed. He says: "Suppose I lend £100 to the bank. The bank will perhaps give me 13 per cent interest and in a year's time they will give me 113 pound notes. But the going rate of inflation is about 15 per cent. So at the end of the year although I get 113 pound notes, each one is 15 per cent short of weight. I will therefore have paid the bank for borrowing my money." He has written about this problem in long letters in the *Financial Times*. He adds a further illustration: "Imagine that I have 100 pints of surplus beer. I can't drink it all, but there's a brewery that's short of beer. So it borrows the 100 pints and it pays me 13 per cent interest. And in a year's time it gives me 113 cans of beer, each one with 'One Pint' written on it. I measure out the contents of the pints and I find that they're all 15 per cent short. The brewer can be prosecuted.

"Now that we've got the Retail Price Index, we can measure out the 'pints of money'. The money unit, the pound, shrinks, but payments nevertheless are conventionally measured in pounds. Contracts of employment are paid in shrinking units, but the worker is not allowed to shrink his units of time, to make his own hours contain fewer minutes. This is an area where I should like to promote sensible discussion."

16 beams from disintegration. During this time Mitchell milked dairy cows and did no scientific work, so that his ulcers cleared up. He got rid of them finally by treating himself with Vitamin C. He takes a gram a day and is an enthusiastic believer in Linus Pauling's theories that human beings have a natural Vitamin C deficiency and require large daily doses.

In the mid-1960s, Mitchell took the fateful decision to "put his money where his mouth was", holding deep convictions about responsibility for the proper use of money. He told none of his colleagues outside, but used his family money (his uncle is a former chairman of Wimpey, the building contractors) to endow a research institute called Glynn Laboratories.

Altogether he and his brother Christopher together put a quarter of a million pounds into the non-profit venture. In addition, Mitchell bought and reconstructed the building with his own funds. The result is certainly one of the largest personal investments of private money in pure scientific research by any scientist in history. The truth about the funding has only lately become known as Mitchell has been forced to seek additional funds to keep his institute going. Though Mitchell himself doubled the endowment to half a million pounds by careful investment, inflation has destroyed the value of the income even from that. So far his fund-

HE BELIEVES IN GENTLENESS AND IN DISCUSSION BY SMALL GROUPS

raising has brought in £30,000 over three years from Shell Research Ltd.

Next month Mitchell receives the Copley Medal, highest award of the Royal Society. His laboratory's scientific achievements are one of the crowning glories of British science in this century. Until only a few years ago, biochemists believed that the basic processes of life, known as metabolism, took place in a watery soup inside the cells. Membranes between the cells' components were seen as partitions separating the soups. Inside the soups floated chemicals which reacted and created life.

Mitchell and his team have totally transformed this inadequate view. They demonstrated that the walls of certain energy-producing components of the cells were intimately related to the reactions, and that the reactions had spatial direction. As the American biochemist Dr Franklin Harold said in the journal *Science*: "Ultimately, we may come to regard (Mitchell's) theory as a first step towards understanding how life gives visible form to the flow of matter and energy through space."

Mitchell explains: "We now see that you can have in living cells power transmission by a mechanism which is strictly analogous to power transmission by electricity." Mitchell has even proved that the "power transmission" in cells is by means of a kind of "reverse electricity". Electricity, which is a flow of electrons (negatively-charged), in this case takes its opposite form which Mitchell calls *proticity*, or a flow of protons (positively-charged). Mitchell now hopes to build model devices that generate and use *proticity*, but he cannot, at present, afford to undertake the necessary research. This important work may be cut off just as it is near to bearing fruit in ideas for possible use in technology.

When Mitchell founded his institute, he instructed his lawyers and a QC to form it as a limited company forbidden to issue dividends on its shares. This enabled him to avoid having a large number of directors. The lawyers protested that such a thing had never been done. But the Charity Commissioners accepted it within only six weeks, though it seems never to have been attempted by anyone else since. Mitchell pays his staff in terms of his own unit of currency, which he calls "the pax", from the Latin for "peace". The *pax* is set as the value of the pound in January 1974, and his staff therefore have their incomes perfectly protected against inflation.

Mitchell is also a registered silver dealer, with his own trademark, and he has refurbished an ancient knuckle press to stamp out his own silver pieces with a pressure of 400 tons. This monster machine is kept outside in a shed Mitchell built round it. He fondly calls it Rameses II because it stands upright and looks rather like a terrifying statue of the Egyptian Pharaoh. Mitchell himself did the design and metal-work to make the dies and adapt the machine, which once produced cutlery in a Victorian factory.

Mitchell likes to think of himself as a gadfly, and occasionally his sense of humour "irritates someone and makes them jump a bit, so that they respond". This is to avoid "playing the game of the quest for truth too seriously, in which case it can become a bore".

For 16 years his fellow scientists have been invited in small numbers to stay at Glynn House, eating good food, smoking good cigars, sleeping on difficult ideas and recapitulating them in the morning. And from confrontation and bitterness has nearly always emerged consensus and friendship. Mitchell desperately believes that gentleness and respect for one's fellows, meeting in small groups for Socratic discussion, and pulling the teeth of animosities over good food and wine could solve many of the world's problems. ●