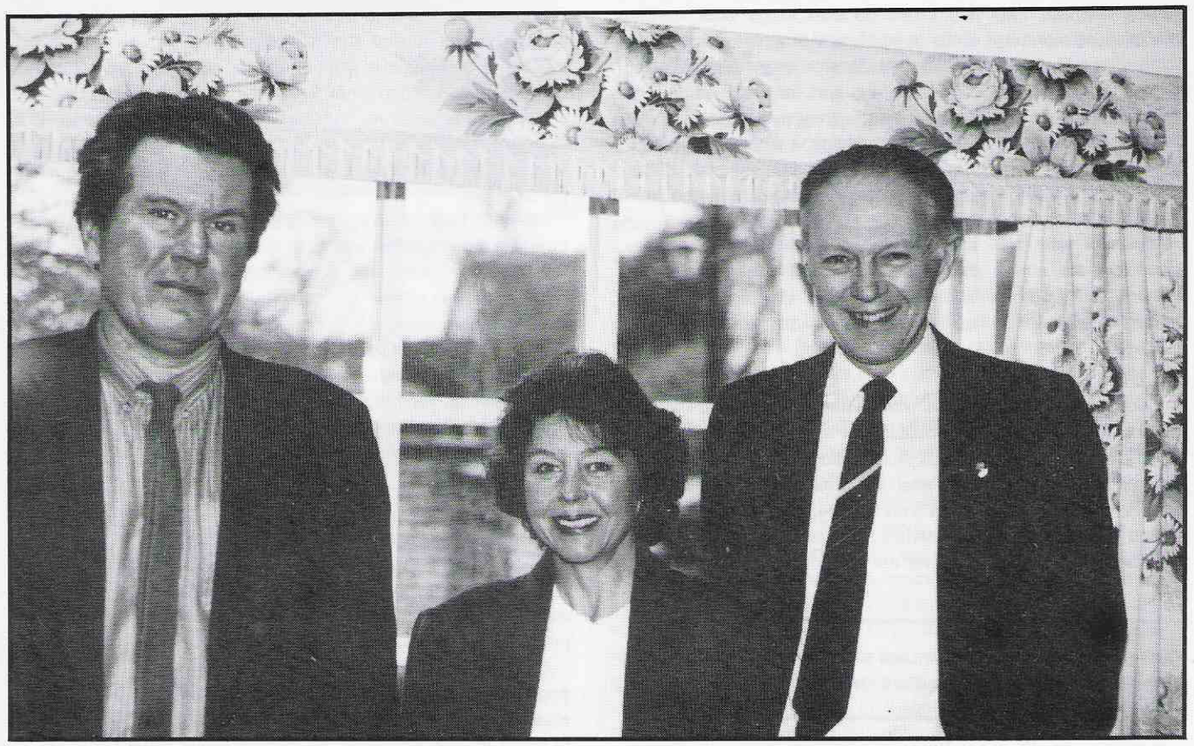
OUT and ABOUT

By Jane E. Mounsey



A Visit to David Filmer Limited, Brent Knoll, Somerset

When David Filmer took early retirement in August 1988, he knew exactly what he wanted to do. It marked for him not so much the end of a career but rather a new beginning for which his 27 years in the feed industry and his earlier academic years were simply the preparation.

David Filmer Ltd., Poultry and Feed Consultants, operate from a large attractive house in Brent Knoll, Somerset to which David and his wife Pat moved a year after the business was launched. Born in Coventry, brought up in Kent, educated in London and Cambridge, employed in Liverpool, Bristol and Basingstoke, he has no real roots. Brent Knoll, situated 15 miles south of Bristol, has the advantage of being pleasantly rural while still being conveniently close to the M5 motorway.

Early Introduction to Poultry

His introduction to poultry came early in life, helping to look after 2,000 head of chicken on the Kent smallholding his father purchased when David was seven. Encouraged by the example of his grandfather, he showed early evidence of Filmer determination in an ambition to go to University, even though the school he was attending was geared more to the practical training of farmers' sons than as a launching pad for academics. Having won himself a place at the Kent Farm Institute, he went on to win a scholarship to Wye College London but, being too young to start the course, spent a useful year in practical farming.

After three years at Wye College, he emerged not only with a degree but an NDA — not the easiest of combinations. Envisaging an academic career, a year was spent at Cambridge taking a post graduate diploma, after which compulsory National Service intervened.

Unwelcome as the two years interruption might have seemed, it was for David, as for many others, a rewarding and, certainly, a broadening, experience. Of even more practical value was his role as a Staff Captain in the Army Emergency Reserve, organising and training fortnightly camps of Army reservists. It may have had little to do with agriculture but it taught him a lot about handling people.

In 1956 he returned to Cambridge to take up a two year research post in the School of Agriculture. It was followed by a further three as a University Demonstrator, lecturing to graduate and post graduate students on pig and poultry husbandry, animal experimentation and statistics.

When the appointment expired in 1961, he accepted a job with R. Silcock & Sons in Liverpool, attracted by the relative splendour of its experimental facilities compared to those of the University. One hundred experiments a year were carried out using three herds of cattle, two herds of pigs, five laying houses, four broiler and two turkey houses.

Exciting Days for Nutrition

These were exciting days. Nutrition was in its infancy and in order to develop new ideas, Silcocks had brought together three very talented young men — Paul Roberts (Statistician), Al Roach (Chemist) and David Filmer (Nutritionist). David recalls with some humour how, on being introduced to a gathering of Buyers as the company's Nutritionist, the reply came *"Your new what?"* It was the first indication to anyone of their generation that the feeding of animals had anything to do with nutrition. Surely, it was merely a convenient way of utilising by products from other industries!

On the basis that very little was known about the science of feeding animals, Paul and David decided to go back to first principles, as a result of which *"a lot of initial progress was made in some species"*. Assuming only that *"energy might be important, and protein was probably important and, of that, lysine and methionine probably mattered most",* they experimented with different combinations of factors to design a turkey feed which brought fairly spectacular improvements in liveweight gain. Within three years, Silcock's share of the turkey feed market rose from three to eighteen per cent.

Advances were also made on the pig side. To avoid stress caused by the abrupt change from creep to finisher rations at weaning time, an intermediate ration was devised. Now high performance grower rations are common to all pig feeding regimes.

Linear Programming

Perhaps the most significant innovation made by Paul and David in those early days was the introduction of linear programming as a new method of formulating diets. Formulation was traditionally done by hand in a time consuming exercise requiring considerable skill. When the computer came in, David told me, there was a saving of around £1 per ton (on raw materials averaging £25 per ton), which gave Silcocks an advantage over the competition for some time to come.

Front page: Jane Mounsey pictured with David Filmer (right) and Colin Fisher, during her visit to Brent Knoll, Somerset.

At this time the Company Buyer was generally the senior director on the Board and far more important than the technical people. David soon learned that any idea which saved money was immediately acceptable, the reverse being the case if the cost was increased. Using a method which is now commonplace but was then revolutionary, he introduced specifications to diets. More complicated rations like broiler, turkey, calf and baby pig feeds were formerly made to a fixed formula. Some were a compromise between a fixed element (e.g. 10 per cent fishmeal) and a part which could be varied. By specifying energy, protein, amino acids etc. the company was able to improve overall quality through higher levels of nutrients, without increasing the cost.

Being responsible for specifications for all cattle, pig and poultry feed, as well as for 100 experiments per year on three company farms, made it a demanding job. The feed industry was as competitive then as it is now and no company was ahead in any particular area for very long. For this reason, David resisted the pressure to do competitive trials on farm, believing time spent improving the product to be more profitably invested.

Meanwhile he maintained a close watch on University research, particularly where it was relevant to his own. Of particular interest were the ideas Colin Fisher was developing at Reading, based on the response of laying hens to methionine intake, which seemed to confirm his own findings that nutrient intake is more important than formulation. Colin was also developing *"some nice mathematical ideas"* as to how to describe these responses — a subject dear to David's heart. In 1968, Colin was persuaded to join Silcock and Lever Feeds (which the company had by now become), on condition he was allowed time to complete his PhD thesis, the results of which were incorporated into David's own ideas about optimal methods of feeding.

During this period, the nutritional side of the company was considerably strengthened by the appointment of Peter Wilson as Development Director and David was able to recruit nutritionists for each of the cattle, pig and poultry sectors.

In 1971, unhappy with the *"difference in style"* following the merger with BOCM, David severed his ten year relationship with the company to join Crosfields & Calthrop (later to become Dalgety Crosfields). As Technical Director he had an almost free hand to set the product range and conduct experimental work. He also had responsibility for Quality Control and, since he has always argued that the job of nutrition is not complete until the product is delivered and the animal performs, it was a welcome addition. As one of only four Directors aboard a very tight ship run by the redoubtable Maurice Warren, David had every opportunity to put his ideas into practice.

Six years later, in 1977, he was headhunted back to BOCM-S — by which time Nutrition was back under one umbrella. The loss of his Director's perks was compensated partly by the attractive package he was offered and partly by the rapport and exchange of ideas available within a larger organisation. From 1977 to 1988, as Company Nutritionist for BOCM Silcock, David was responsible for cattle, pig and poultry specifications, a staff of three nutritionists, R&D planning, reporting and communication. In 1985, he added Poultry Marketing Manager to his other responsibilities, with all that implied in terms of marketing strategy, product development and campaign planning.

The Birth of FLOCKMAN

It was during this second period with BOCM-S that David started to develop ideas about *FLOCKMAN,* an electronic system for monitoring and controlling environment and performance in intensive poultry houses.

By the early 1980s, everyone was beginning to realise that performance was closely linked to the animal's daily intake of nutrients which, in turn, depends to a large extent on the conditions in which it lives. For example, appetite tends to be depressed at higher temperatures and, if growth is to be maintained, feed must contain higher levels of nutrients. Easy enough to say, more difficult to do, as David and Dr. Chris Belyavin of Harper Adams found when they started to address the problem eight years ago.

The difficulty lay in predicting in advance what birds will eat and, therefore, what levels of nutrients should go into the feed. They concluded that if you could not predict feed intake accurately, why not simply measure it daily? Then you could use the information to determine the next day's diet. The next problem was to devise a system in which the diet could be changed on a daily basis.

Their solution was a blending system whereby each poultry house is equipped with two feed bins — one containing a high protein feed, the other a low protein feed. Based on the previous day's feed usage, total feed intake for the day can be calculated and the two feeds mixed to give the correct nutrient level. If the environment of the poultry house can also be controlled in terms of temperature, humidity and ammonia level, the unit can be managed much more cost effectively.

"What we have tried to do', says David, *"is to bring nutrition under the control of the farm manager",* believing the nutritionist to be too remote from the chicken to make such day to day decisions.

Harper Adams Poultry Research Unit was commissioned to develop the project on behalf of BOCM Silcock, who saw it as a performance enhancing tool for the exclusive use of their customers. Once Chris and David were satisfied with the design of the environmental controls, they approached a number of manufacturers, amongst them Stonefield Systems — a company with

Above: David Filmer and Colin Fisher in conversation with Chris Belyavin of Harper Adams who has been closely involved in the development of FLOCKMAN.

wide experience of the greenhouse industry where sophisticated computer control of the environment has been in place for many years.

Award Winning System

The original version of *FLOCKMAN* (which won the *Poultry World* New Equipment Award at the 1986 Poultry Fair) was in process of production when David came up for early retirement in 1988. Being *"too young to ride off into the sunset"* (his words) and certainly too full of good ideas (mine), he came to an agreement with the company that, in return for their interests in *FLOCKMAN,* he would not offer his services as a Consultant to any BOCM-S competitor.

Although BOCM-S had made a significant investment in the system, the benefits in terms of increased sales of broiler feed were not seen by them to be overwhelming, since integrators, for the most part, manufactured their own. David, on the other hand, fully appreciated its potential and also saw it as the perfect vehicle for applying scientific mathematical skills to the rearing of livestock. Skills which, he argues, are long overdue. What he eventually wants to do, he says, is to try to integrate into a computer package all the skills which are available in nutrition, in environmental control, in genetics and on the economic side, to help producers become more efficient. *"Integrated broiler production is the ideal starting point for this sort of new technology which in ten to twenty years will be standard practice in all types of animal production".*

Listening to this, it is difficult to think of a more perfect vehicle than *FLOCKMAN* for David's enthusiasms. It combines his life long interest in nutrition with a passion for maths and computers which became ever more clear as the day progressed. If more evidence were needed, contract bridge and computing appear high on his list of leisure activities alongside snooker and travel.

David Filmer Limited

Having negotiated the deal with BOCM-S, David retired at the end of August 1988 and launched his new business under the name *David Filmer Limited,* Poultry and Feed Consultants. Since the equipment for *FLOCKMAN* was not quite ready, his main source of income during the first year came from consultancy to some very well known companies, amongst them ICI Nutrition and British Sugar.

By mid 1989, satisfied that *FLOCKMAN* was by then ready for the market, he made his first major sale to a large integrator. The system was installed in four poultry houses on a site of twelve — to allow comparisons to be made. Typically, says David, it took several crops before they were sufficiently convinced to apply it to a further eight new houses.

"The economics are quite persuasive", he adds with masterly understatement, indicating a spreadsheet of detailed costings. His preparation is thorough with the mathematician's eye for detail. A full system requires sensors, weighers, meters, a computer, printer and software. For a 100 to 300,000 bird site the total cost is 20 to 30p per bird. With savings worth 4p/bird/crop, this gives a pay back time of 5 to 7½ crops or 10 to 15 months. If whole wheat is progressively incorporated into the bird's diet in the last stage of growth, additional savings can be made which reduce pay back times still further.

Costings are based on extensive trials of *FLOCKMAN* controlled houses versus normal houses on well run commercial sites. Ironically, the potential cost benefits for the broiler industry are so great, David *under* rather then overstates them, claiming 3 to 4 per cent improvement in FCR when in reality it is between 4 and 8 per cent. Even so, capital investment of around £9,000 per house is a Board decision and there is still some scepticism in a notoriously conservative industry.

Three Party Involvement

When an order is placed, Stonefield Systems manufacture the kit and commission the system for which DFL and Harper Adams each receive a royalty. Having developed most of the analysis software, David's responsibility is *"the front end bit"* which interprets what is happening and shows the farm manager very simply on the screen what the position is and what corrective action (if any) is needed. As the technical chicken expert, he is also the one to liaise with the client and prepare the quotation.

Liaising with the client means working out a feeding regime which suits him best. Whether it is so many tonnes per 1,000 birds or so many days on each ration, or a fixed proportion of each blend, or making daily lysine intake the crucial factor — the computer is powerful enough to cope. Only three or four years ago that would not have been the case and David has had to go to the highest technology to do it. Computers are now so powerful, he says, that what you can do is only limited by your imagination.

The strategy has been to target larger integrators in the expectation that a successful application to one site would automatically lead to others. While a hand holding exercise may be necessary for the first two crucial crops, once the manager is trained there is no need for further involvement. His aim is to market the kit, make sure it is being used to best advantage and then to retire to a discreet distance. If support should be needed, there is a facility to interrogate the customer's computer by telephone. In this way, information is transferred from the customer's site and downloaded into David's computer at home. In the event of a problem, data can be regenerated and analysed throughout a continuous period of operation. In addition, it should provide all the data needed to generate optimal chicken growing for the future, based on real commercial information. In this sense it doubles as a research tool, capable of storing and analysing archive material.

Understandably, large integrators are reluctant to show interested parties round their sites because of fear of disease and of losing their competitive edge. For this reason, David and Chris Belyavin are hoping to set up a large demonstration unit with two houses each containing 40,000 birds, on a contract grower's site.

One Man Band

Essentially still a one man band, David was becoming overwhelmed with all the demands of the business. With each new installation came new responsibilities in terms of overseeing early crops, writing new programs, analysing information, refining and developing software and preparing quotations. Add to that his own administration plus important consultancies and legal work — the list was growing and so was his working day.

Family involvement has eased some of the load. Pat gives both moral and practical support with administration while Robert, their son, gave up a career with the bank to help on the financial side and Susan fills in while he is away. Once *FLOCKMAN* was launched, however, he needed someone with skills similar to his own and found just the person in Dr. Colin Fisher.

Since 1968, Colin has worked exclusively in nutritional research — for the last 15 years in research management, first at Colworth House and latterly with the AFRC. The severe cutbacks experienced by that organisation in recent years led to his early departure and their loss was David's gain. He and Colin have known and worked with one another for many years, sharing similar ideas and philosophies on the feeding of animals. In becoming a consultant to DFL, Colin will be concerned primarily with overseeing *FLOCKMAN* installations north of the border and helping David promote the system abroad.

Marketing Overseas

Now that a firm base has been established with major UK integrators — 29 installations have already been commissioned in England and Scotland — David is ready to approach the overseas market. Visits to Hungary, Spain and Estonia took place towards the end of 1990 and in February this year David and Colin were guests of the USSR, visiting poultry institutes and state farms in Moscow and four neighbouring provinces.

The potential for the system in eastern Europe is unlimited given FCR of 3:1 compared to 2:1 in the West. An improvement of 20 to 25 per cent is easily attainable but even a 10 per cent improvement to 2.7:1 would guarantee a very short pay back time. Given the same basic raw material as in the UK (and Ross Breeders are already selling chicks to Russia), the same feed and the same environment, FC could jump from 3 to 2, David assured me. In a country where food shortage is a major problem, the prospects are tremendously exciting!

The stumbling block is the lack of hard currency. David is learning fast about 'counter-trade' — sadly, bartering is confined to goods produced by the companies with whom you are doing business, so vodka is out! (Anyone interested in 20 tonnes of chicken liver paté or powdered egg?)

Nevertheless, he is hoping to return from the trip with at least one site of ten to twenty houses in which the total kit would be installed. To reduce import costs, subsequent sales will probably be confined to the *FLOCKMAN* box — hardware and integrated software — the rest they can no doubt sustain themselves.

In April David goes to Australia to speak at a conference on *"Recent Advances in Animal Nutrition".* While there he will do some consultancy work and take the opportunity to see a number of major integrated chicken companies. Other English speaking countries to be targeted are New Zealand and South Africa which Chris Belyavin hopes to visit shortly.

Other Applications

With limited time and manpower, the system has so far been restricted to the broiler industry where pay back is rapid and results very visible but, clearly, it has applications to other species and the necessary patents are already in place. The turkey industry is a likely candidate and talks are in progress with layer producers — though the turnround here is one year and *"it takes three crops to convince people they can believe the figures",* says David.

Expansion into other markets and other applications will require additional personnel. Apart from Colin, David has already approached others nearing retirement with similar backgrounds and expertise. Necessary qualifications for joining the team include poultry, nutrition and advisory skills plus commitment and initiative, since they are breaking new ground all the time. At the moment, the kit is just *"a practical tool to grow chicken better but in the long term it could develop into an integrated computer package".*

If DFL establishes itself abroad, it will need people within those countries who can handle it. David will also need to find the local equivalent of Stonefield Systems in Australia, New Zealand and South Africa to manufacture the equipment. Indeed, by the time David returns from Australia, a new subsidiary company may very well have been set up.

Meanwhile, at home in the UK, wearing his consultant's hat, David is developing some new ideas for Ross Breeders (in association with Colin) on the feeding of chicken. British Sugar, UM, Rhone Poulenc and Monsanto are also among his clients. Specialising in the analysis of data, he also acts as an 'expert witness' in legal cases — sometimes on behalf of feed companies, sometimes on behalf of farmers. Finally, in conjunction with Professor Colin Whittemore, he still finds time to run a three day course for final year students at the Edinburgh School of Agriculture where he is a Visiting Fellow.

Anyone who knows David Filmer cannot fail to be impressed by his enthusiasm, his professionalism and his sheer intellectual ability. He has the capacity to make complex scientific and mathematical subjects appear simple. He is persuasive in argument. He is in fact a born salesman whether he is selling himself or innovative ideas or a sophisticated system which will put these ideas into practice. In short, he has the right combination of character, expertise, ability and will to succeed. His ambition, he says, is to achieve a £1 million turnover in the first five years.

If you are a betting man, my bet is, your money would be safe.

***FLOCKMAN* — How it works**

Each poultry house is divided into two zones with heaters in each end and typically eight fans to a zone. Sensors hanging at bird height detect temperature, humidity and ammonia levels.

The fans operate in eight stages from a few for minimum ventilation to all for maximum ventilation. If humidity or ammonia reach pre-set levels, fans will operate to remove air and fresh air is substituted automatically. If, as a result, temperature drops below a pre-set level, heaters are automatically activated. By balancing the operation of air inlets, fans and heaters, the correct environment is achieved.

The result is drier litter conditions and more comfort for the birds, coupled with reductions in hockburn and breast lesions.

Graphical displays for temperature, humidity and ammonia (actual and target levels) are shown on a colour monitor in the farm office, making it easier for the manager to visualise the situation and spot trends.

In addition *FLOCKMAN* automatically monitors daily feed and water intake using a feed weigher and water meter in each poultry house, wired back to the control box. A perch weigher on to which the birds jump at random records daily liveweight. *FLOCKMAN* then calculates LWG and FCR, all of which is shown graphically on the monitor.

The most sophisticated part of the system (jointly patented by DFL and Stonefield Systems) relates to the feed control whereby feed from two bins is fed into a weighing device, linked to the *FLOCKMAN* control box, which can vary the ratio each day in whatever proportion the manager requires. Once it is known how much the birds are eating, the correct nutrient intake is assessed, blended and piped through to the chicken house.

Reprinted from Feed Compounder April 1991

Printed by Creative Press (Reading) Ltd.