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Elected FRS 1981

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Walter Plowright was a distinguished veterinary scientist who spent most of his active research life in Africa in the Colonial Service studying infectious diseases of cattle, sheep and pigs. Walter came from Lincolnshire farming stock but during his grammar school education decided that rather than following a career on the family farm he wished to be a veterinary surgeon. On graduating from the Royal Veterinary College, London, in 1944 he joined the Royal Army Veterinary Corps and had postings to the Middle East, Kenya and North Africa. It was this experience that convinced him he wished to spend his career in studying infectious disease of animals. Soon after demobilization he joined the Colonial Veterinary Service, in which he made major contributions to the understanding and control of several infectious diseases. His major contribution was the development of a tissue-culture-adapted attenuated rinderpest vaccine and seeing it into practical use. This vaccine has been the keystone in the global eradication of this disease, only the second disease after smallpox to be eradicated worldwide. This was a massive contribution to agriculture and humanity, and was recognized by the award of the World Food Prize. Walter had a clear and incisive mind, and his research was characterized by novelty, perseverance and attention to detail. He was driven by a wish that his work would provide an understanding of infectious diseases and contribute practically to their control.

FAMILY BACKGROUND

Walter’s paternal grandfather came from a line of Plowrights who lived in the Pinchbeck district near Spalding in Lincolnshire. He moved a short distance away to the village of Gedney, where he was a small farmer employing a single labourer. Walter’s father, Johnathon, was born here in 1880, the third child of Annie Mary Plowright, wife of Johnathon, who came from Stanner in Norfolk. Walter’s father and his mother, Mahala, left school at the age of 12 years
for service with local farming families. Johnathon spent three decades in varied agricultural work gaining wide experience and eventually responsibility. The opportunity to acquire his own smallholding came with the break-up of large farms owned by Guy’s Hospital after the reforms instituted by Lloyd George. This smallholding was at Guy’s Head near Sutton Bridge, behind the bank that confined the tidal River Nene on its way from Wisbech and Sutton Bridge to the Wash. It was here that Walter was born on 20 July 1923, the middle of three sons. After the birth of the third son the family moved in 1926 to Holbeach, Lincolnshire, away from the windswept flatland and salt marsh and to ensure a decent education for the children. Johnathon bought a small freehold farm of about 50 acres (figure 1) that was conveniently situated within easy walking distance of schools and shops. It was here that Walter’s two sisters were born.

**EARLY LIFE, SCHOOLING AND COLLEGE**

All Walter’s early memories were of family life on a small farm at the edge of a country town. The farm was in a rich agricultural area in the south Lincolnshire fenlands. Life on a small mixed farm was hard but varied. The Plowright farm had cows, pigs, chickens and heavy horses, as did most small mixed farms of the period, and it was largely self-sufficient for food and animal feedstuffs. The labour came mainly from the family with some extra help at the time of the harvest. Walter’s school holidays were almost entirely spent working with the men on the farm—making hay, picking and sorting potatoes, cutting mustard and turnip seed by sickle, and harvesting cereal crops by binder, reaper or even grass-mower, the last when the rain had flattened the cereal. So many of these operations were very hard work for a schoolboy but it was a matter of pride to try to do the same as hardened men and not complain too much about sore arms, sunburn and aching limbs. His mother worked as hard in the home as his father did on the farm. Small farm life and the countryside were his only formative environ-
ment until he left school. This background to his life established in him the virtues of hard work—the ‘work ethic’.

From the age of four years Walter attended the local state primary school. It had two excellent lady teachers who initiated him into the rudiments of reading, writing and arithmetic. After four years he moved on to the state intermediate school in Holbeach, which took children to the school leaving age of 14 years. At 11 years of age he was entered for written examinations and interviews for a ‘free place’ in two local grammar schools, at Moulton and Spalding. He was successful in both examinations and it was decided that he should go to Moulton, a small Elizabethan establishment closer to home than Spalding. He cycled the four miles to school each day. There were five forms, no more than six masters and a maximum of 125 pupils. The school prepared pupils for the Cambridge School Certificate and exemption from Cambridge Matriculation. He won prizes in each of his four years at the school and did well in the School Certificate Examination. The recipients of prizes were required to choose their prize from a list of books. Interestingly, he chose for the first year *Wanderings in wild Africa*, written by a ‘white hunter’ (C. T. Stoneham), and in subsequent years *The complete works of William Shakespeare*, *Palgrave’s golden treasury* and Charles Herbert Best and Norman Burke Taylor’s *The living body*, showing an interesting catholicity of taste. The first book gave him some background for his unanticipated years in Africa and the latter was used frequently in his sixth-form studies.

The next decision facing Walter was whether to choose the arts or the sciences for his sixth-form studies. This was solved by his choice of a career. He had developed a high regard for the animals on the farm and this, together with an attraction to the working life of the local veterinary surgeon, convinced him he wished to be a veterinary surgeon. This choice was not approved by his father because he had assumed that Walter would leave school at 14 years of age and join him on the farm. His mother was more tolerant and supported him when she saw how determined he was. However, his father eventually came round to accepting his choice of career, and from then on he was strongly supported by both his parents.

Walter’s choice of career required him to pursue a scientific course of biology, chemistry and physics in the sixth form. His first year was unconventional, because he was the only pupil in the science sixth form. The only science master was a botanist who largely left Walter to his own devices. He had access to a laboratory and collected textbooks. He had brief discussions with the science master but had little tuition. In his second-year sixth form he moved to Spalding Grammar School, eight miles from his home. This school was much larger, with specialist science teachers who provided conventional classes, although there was much that he was left to achieve on his own. To reduce the cost of the veterinary course it was essential for him to pass the Higher School Certificate in biology, chemistry and physics, which would allow him to enter the second year of the five-year veterinary course. This he did in the summer of 1940. He chose to go to the Royal Veterinary College, London, but was apprehensive about ‘the big city’. So it was with relief that he learned that the college had moved for the duration of the war from Camden Town to Sonning near Reading University and Streatley on the Thames in Berkshire. It is fair to say that he arrived at college very much the ‘country bumpkin’ but left as a much wiser and more confident individual.

The first two years were preclinical studies held at Sonning and Reading University and the last two at Streatley were paraclinical and clinical. Most of the teaching was drab and uninspiring. But Walter’s experience at school of self learning and reading widely stood him in good stead. There were some notable exceptions, and one inspiring teacher was the then
Dr (later Professor) E. C. Amoroso (FRS 1957), who enlivened the teaching of histology and embryology. Walter was a good and studious student and gained several prizes throughout his student career. He qualified as a member of the Royal College of Veterinary Surgeons a few days before his 21st birthday—the minimum age for acceptance into the profession.

**ROYAL ARMY VETERINARY CORPS**

Feeling privileged and somewhat guilty to have had exemption from military service while attending veterinary college, he responded to the need for more recruits for the Royal Army Veterinary Corps by volunteering. He took up his commission and after six weeks of training in all aspects of equitation and the details of King’s Regulations he was dispatched abroad: first to Palestine, then to a Remount Depot outside Beirut in Lebanon where thousands of mules were being trained as pack animals for use in the mountains of Italy and the jungles of Burma. He conducted one contingent of mules by boat to Karachi, India.

Soon after VE Day he was posted via Cairo to Kenya, where they were holding several hundred mules destined for Burma. He went by flying boat to Lake Victoria, stopping at various interesting places en route, and then by train from Kisumu to Nairobi. He spent six months in Kenya, which he found a beautiful and diverse country. He was based at Naivasha in the Rift Valley at first and then at Nanyuki. The latter was at an altitude of more than 7000 feet and near the base of Mount Kenya. He was provided with a mobile laboratory and part of his duties was to carry out round trips of about 300 miles, calling at Army establishments. In this way he experienced the beautiful and variable countryside and its wildlife. His main duties were to look after the health of army horses and mules, but he also had the opportunity to experience some of the large dairy farms in the area. There were few animals at Nanyuki, and he found the professional life boring. However, he was able at the weekends to go on safaris and learn more of the country and its wildlife. One safari strong in his memory was to a point 13,000 feet up Mount Kenya.

The war in the Far East had ended, and after overseeing the disposal of the few remaining mules Walter wrote to East Africa Command suggesting that there was no longer justification for his presence at Nanyuki. The response was a visit from a brigadier whose opening remark was, ‘So, you are the fellow who wants to get rid of himself!’ A few weeks later he was sent on home leave, after which he was told to report to the Middle East Command in Cairo. On doing so he was immediately dispatched to Tripoli on the north African coast. Here he acted as the ‘chief veterinary officer’ with the acting rank of major. A main commitment of this post was to offer advice on animal husbandry and diseases to the Tripolitania Police Force. This entailed visiting police stations, and these tours enabled him to see much of the country. His involvement in the purchase of remounts for the police also took him to Tunisia, where the quality of the animals was reputed to be better. During his time in north Africa he learnt a lot about lameness in equids and diseases of farm animals and camels. He had access to and used a small laboratory adequately equipped for simple diagnostic procedures. He enjoyed his life, living well and meeting many and varied people and being highly respected as a professional. However, all good things come to an end and in 1948 he left Tripoli for his demobilization from the Royal Army Veterinary Corps. As one of his contemporaries remarked, ‘You can now forget, forever, about entering the good hotels, eating out in style and getting your holidays free.’
Walter enjoyed his time in the army, which had provided him with opportunities to see other countries and peoples. He also appreciated the standard of living and lifestyle of an army officer. In his own words, he had ‘started as an impecunious young graduate who knew little about the world outside the farm and veterinary school and was to return a little wiser and probably more confident’. He was now faced with the question of what he wanted to do with his life.

**CHOICE OF CAREER**

He reflected that his brief exposure to mixed veterinary practice as a student and the occasional locum position before mobilization was not a satisfying experience, largely because of the routine nature of much of the work and the inability to follow up cases to the exacting standards he imposed upon himself. He also felt that he was unsuited to running a practice, which is essentially a small business. His experience in Kenya and Tripolitania had shown him how much more interesting it was to investigate infectious diseases thoroughly, especially those that involved herds or populations of animals rather than individual cases. In fact his experiences in the army had stimulated his interest and provided the basis of his choice of career. However, he realized that he was ill equipped for achieving his career vision. He needed training and experience in the disciplines that at the time came under the umbrella of pathology. For this reason he applied and was accepted for the post of Demonstrator in the Pathology Department of his Alma Mater, the Royal Veterinary College. He was assigned the area of gross and microscopic changes of diseased tissues for his teaching and study. He was given little training and lacked a mentor. Even so, he became interested in pathological conditions affecting the brain and spinal cord of dogs. His first investigation was of an infection in a litter of puppies caused, he concluded, by an organism well recognized in rabbits, *Encephalitozoon cuniculi*. Interestingly, during his first tour of Kenya in the Colonial Service he found the same organism as a cause of a rabies-like condition in dogs described by Guy Yeoman that was important as a differential diagnosis for rabies. Two of his early publications described these studies (1, 2)*. However, he had no encouragement at the Royal Veterinary College to progress this study. He now realized that this environment was not going to provide him with the training in research or the career he sought and that he needed to look elsewhere for employment.

**COLONIAL SERVICE IN AFRICA**

*Kenya first tour*

After looking around for alternatives he applied to join the Colonial Service, which seemed able to offer several of the material things he missed on his return to the UK but, more importantly, an interesting career in research. His application was successful and he was offered a posting as a Veterinary Research Officer to his country of choice, Kenya, of which he had some knowledge from his army days. He accepted immediately because the prospect of

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* Numbers in this form refer to the bibliography at the end of the text.
returning to a country that he knew to be beautiful and offered almost unlimited opportunities for research as he saw it was an opportunity not to be missed.

He left for Kabete in early 1950 for a four-year tour. Out of the next 21 years he spent 19 in Africa, where his major contributions to infectious disease were made. The first 14 years were in the Colonial Service. At the end of this time, in 1964, he returned to England and worked at the Animal Virus Research Institute, Pirbright, for two and half years, after which he was seconded back to Muguga in Kenya as Head of the Division of Virus Diseases.

On arrival in Kabete in 1950 he was told he was to be regarded as a pathologist and was to take charge of a routine diagnostic laboratory. There was a large and varied throughput ranging from the examination of blood smears and lymph node impression slides for the diagnosis of protozoal diseases to the confirmation of major epidemic diseases such as rinderpest, African swine fever, Rift Valley fever and cases of rabies. In addition the European cattle suffered from diseases of a temperate climate. At first he was not happy with these responsibilities but soon came to realize that this was the best way to familiarize himself with the many diseases of a range of species of both tropical and temperate climates that were frequently encountered in Kenya. He was also responsible for the production, safety and potency testing of animal attenuated and inactivated rinderpest vaccines. Once settled in with his new responsibilities he was able to pursue his interest in the investigation of disease outbreaks. This was invaluable background experience for the opportunities that came later to undertake research into major infectious diseases of African domestic and wild animals.

In the fourth year of his tour in Kenya, in spite of its many attractions, he became increasingly unsettled about his future in the Colonial Service. In spite of all the unique and intriguing problems that had come his way, he was not resigned to the ‘pathology’ role that had been allocated to him and the resulting inability to have a more decisive influence on the direction of research on major infectious disease problems with which he had hitherto been peripherally involved. These included rinderpest, of course, but also African swine fever, malignant catarrhal fever and Rift Valley fever, among others. In a display of ‘pique and rebellion’ over several matters he resigned a few months before the end of his tour—an action he later considered was without adequate justification! He returned to England in August 1953, having accrued more than six months of home leave.

Nigeria

Once again he had to find another job, and he was still wishing to find employment in research on major infectious diseases of farm animals. Fortuitously, just as he was called to interview for a post at the Ministry of Agriculture’s Central Veterinary Laboratory at Weybridge he received from the Colonial Office an offer for a post of Veterinary Research Officer at the Federal Nigerian Veterinary Research Laboratory at Vom. Now conscious of, and missing, the many advantages of the Colonial Service, not least of which was the impact of veterinary research in countries where the animal industry was of pre-eminent importance to the economy, he accepted with alacrity. He left for Nigeria by ship in March 1954. After landing at Lagos he was taken to Vom near Jos, the administrative centre of the Plateau Province, where the climate was more bearable than the heat and humidity of Lagos.

He was initially asked to work on cutaneous streptothricosis, an unpleasant skin condition reputed to be the most important disease of cattle in Nigeria. The novel contribution he made to the disease was to show that in Nigeria it was transmitted by ticks and could be prevented by dipping with an ascaricide (3). However, he found that cattle dips were not available to
the large number of native cattle and became disillusioned about veterinary research in those colonies without a developed livestock industry.

After eight months at Vom, Walter was transferred to the Virology Section, which was responsible for the production of lyophilized vaccines for rinderpest, fowlpox and Newcastle disease. It also had responsibility for the diagnosis of these diseases, to which Walter added rabies. The rinderpest vaccine was goat-adapted and consisted of preparations of the spleen of infected goats; this and the vaccine’s testing for potency and safety required large numbers of goats and cattle. Because this vaccine could not be used in many circumstances in west Africa he extended work on a lapinized (rabbit-adapted) vaccine. The only available vaccines for rinderpest at that time were grown and tested in animals, and they all had their limitations. This led Walter to believe that many of the problems of rinderpest control or eradication with live-virus vaccines could not be satisfactorily resolved without cheaper, safer and more reliable laboratory procedures, not to mention vaccines. He considered that these objectives should be achievable if the new ‘tissue culture’ techniques, which were being applied so successfully to the human viruses of poliomyelitis and especially measles, were to be developed for rinderpest viruses. He put together the equipment, facilities and procedures needed to establish a ‘tissue culture’ unit. However, he had little success, largely because of the difficulty in obtaining the components of tissue culture media and the poor quality of the technical support. It became clear to Walter that Nigeria, despite its large and productive livestock economy, was not a place to progress his ambition to be a major participant in and leader of research on the major infectious diseases of Africa. At this point he started negotiations to be transferred to the newly established laboratories of the East African Veterinary Research Organisation (EAVRO) at Muguga, in Kenya.

East African Veterinary Research Organisation, Muguga, Kenya, 1956–64 and 1966–71

The transfer was approved in principle but it took nearly a year of negotiation and bureaucratic administration before his transfer was formally agreed in January 1956. He was excited about returning to Kenya and to a modern and recently built institute. He did not regret his time in Nigeria because he had experienced and learnt a lot on his short tour. He was appointed as a Veterinary Research Officer, Pathologist, a subject of concern to him and of much of the negotiations. However, the mandate of his appointment included the initiation of studies of the pathology and pathogenesis of major infectious diseases of east African livestock. Clearly this could not be done without access to the causal agents and sequential collection of material from infected animals.

At the end of his first tour in 1959 Walter married Dorothy Joy Danielli (née Bell), who had come to Muguga in 1956 as secretary to the Director. A few days after their marriage they returned to the UK on home leave and their honeymoon. After visiting Walter’s family he went on a planned six-month tour of laboratories in the USA and Canada, which was facilitated by his Director, Howard Binns. After a few weeks he was joined by Dorothy. He visited laboratories from east to west coasts, travelling largely by car. He benefited greatly from this tour, making contacts valuable for the future and learning about current techniques, such as cell culture and immunofluorescence, used for investigating infectious disease of humans and animals.

In January 1960 Walter and Dorothy returned to Muguga. Dorothy was a great support for Walter throughout his career (figures 2 and 3). They were very close and shared everything; they celebrated their 50th wedding anniversary in the year before Walter died.
In 1961 a scheme for early retirement from the Colonial Service (by that time called Her Majesty’s Overseas Civil Service) was announced. Walter decided not to take advantage of this but to stay on at Muguga. The consequence of others taking up the scheme and leaving immediately was that in 1962 he found himself not only Head of the Pathology Department but also Head of the Virology Department. The consequence of these promotions was that he had to agree to serve for a period of two years to July 1964.

Walter left the Colonial Service in 1964 after a very productive eight years. On returning to the UK he joined the research staff at Pirbright after a very short abortive appointment in Canada. After two years at Pirbright he negotiated a secondment back to Muguga, as Head of the Division of Virus Diseases, where he spent the next five years (figure 4); finally returning to England in 1971. It was during his time in Kenya that Walter made his main contributions to veterinary virology and infectious disease.

Rinderpest

On his return to Kenya from Nigeria, Walter chose rinderpest for his initial studies. He gained knowledge and experience of the sequential pathological changes in rinderpest, including those produced by virus strains of varying virulence. It was his good fortune that there became an urgent need for an invigoration of the ‘tissue culture section’, which at that time had no other research officer involved and had been unsuccessful in achieving its remit to grow

Figure 2. Walter and Dorothy Plowright visiting Walter’s brother’s farm in 1964. (Photograph provided by Helen Leeds.)
Walter Plowright

rinderpest virus in cell culture and produce a vaccine. Walter took over the responsibility and immediately changed its direction to concentrate on establishing the production of monolayer cultures from trypsinized tissues such as were widely used by that time for research on poliomyelitis, measles and foot-and-mouth disease.

Walter chose calf kidney cell monolayers and a virulent strain of rinderpest virus. Seeding such cultures with spleen-derived virus did not produce any cytopathic changes, even after four passages. As culture fluids produced disease in cattle, the cultures were supporting the growth of the virus. However, this system was of little value unless recognizable cytopathic effects were produced in the cells. At this point he decided to change the procedure by mixing the virus with the kidney cell suspension before seeding the culture flasks. This was a novel and key move: the results were spectacular, as large areas of the newly formed monolayer showed extensive cytopathic change within 4–6 days (4, 5). Using this procedure he developed systems for the quantitative assay of rinderpest virus and neutralizing antibody that revolutionized the study of rinderpest (7). This was a major step forward (figure 5).

There was active discouragement by the Director, Howard R. Binns, for developing a tissue-culture-attenuated vaccine for various reasons. However, Walter was not deterred and, characteristically determined and ignoring authority, he passaged his tissue-culture-adapted virus to see whether it increased in virulence. This side of his character was shown well in a story told by a member of his staff during his last appointment, at Compton (see below). The
member of staff wished to undertake an experiment that would use a large number of cattle but was concerned that because of the expense he would be denied permission. Considering it an important experiment, Walter advised him to do it and only ask permission later, even be prepared to apologize, but always to do it! Walter was so fascinated and knowledgeable about the pathogenesis of viral diseases that he would not allow bureaucracy to spoil a good experiment.

Over the first 10 passages the tissue-culture-adapted virus did increase in virulence as determined by infection of cattle. However, during subsequent passages there was a decline in virulence to the point at which the virus was highly attenuated, producing no clinical signs in cattle. The attenuated virus was found to grow to the same concentration in culture as the parent virus and was capable of immunizing cattle against challenge with the parent virulent virus. These studies showed clearly that a tissue-culture-attenuated vaccine was a candidate for use in the field. It would be cheaper to produce and assay than those attenuated in animals and might well have other advantages. However, it was essential to establish the dose of attenuated culture virus necessary to immunize cattle reliably in the field, and also its stability and length of immunity after vaccination. Through extensive laboratory and field trials he showed that the vaccine was efficacious with a long-lasting immunity (11, 18); it did not return to virulence by passage in cattle or spread by natural routes, demonstrating that it was stable and safe in European and indigenous cattle.

On his return to Muguga in 1966 as Head of the Virus Division on secondment from Pirbright he had the responsibility for the production and associated potency and safety testing of his cell-culture rinderpest vaccine. At this time about 4.5 million doses were produced annually, but shortly after this the laboratory had the capacity to produce 20 million doses a year. At that time there was no commercial production of the vaccine.

The development of this vaccine, which stimulated lifelong immunity to the globally important disease rinderpest, is the work for which Walter is best recognized. The vaccine has been a keystone in the global eradication of rinderpest, which is predicted to be officially announced towards the end of 2010. This has been a massive contribution to agriculture and to humanity. It will be only the second disease, after smallpox, to have been eradicated globally.
Walter’s contribution has been recognized in many ways, notably by the award in 1999 of the World Food Prize. The importance of this work is best illustrated by a quotation of the chairman of the World Food Prize Foundation made at the time of the presentation:

Dr Plowright should be counted as one of the greatest heroes of the 20th century. His development of the rinderpest vaccine nearly forty years ago has helped save countless lives, while ensuring that our global food supply remains abundant and safe for future generations.

**Malignant catarrhal fever**

Walter undertook important studies of several infectious diseases in addition to rinderpest during his period at Muguga from 1956 to 1964. These include poxvirus diseases such as lumpy skin disease of cattle, Orf and sheep pox and a herpesvirus-induced disease, pseudo-lumpy skin disease. There is not space here to go into details of the work on these diseases but there is one major study that illustrates Walter’s enquiring mind and his attention to detail that must be described. This is the work on malignant catarrhal fever (MCF), a lethal disease of cattle commonly associated with the intermingling of native cattle with herds of calving wildebeest.

At the time that Walter became interested in MCF the nature of the causal agent was not known other than it did not pass through filters in the manner of known filterable viruses or survive freezing or lyophilization. This meant that there was no laboratory source of infected material with which to start his investigations. He had no alternative but to collect blood and tissues from wildebeest and use it to inoculate cattle in the laboratory’s isolation units in the hope of reproducing the disease. This was successful and by serially transmitting the disease
in cattle he had continuously available material to work with and a detection system for the infection, albeit a very expensive one. He now made a detailed study of the pathogenesis of the disease.

He was able to show that the infection in wildebeest was maintained by transplacental transmission but he was frustrated by the inability to find a cell culture system that supported the growth of the causal agent. At this point he read a paper by Professor R. J. V. Pulvertaft and colleagues of St George’s Hospital in London on the culture of human pathological thyroids. Cultured thyroid cells taken from infected cattle resulted in a cytopathic effect after several passages, and cells, but not fluids, reproduced MCF in cattle. Although such cultures were clearly infected with the agent of MCF, it was cell associated. This characteristic together with the type of cytopathic effect suggested to Walter that the causal agent was a herpesvirus (6, 8). He then showed that thyroid monolayer cell cultures could be used to isolate the MCF agent from the blood of infected cattle, with the characteristic cytopathic effect occurring within seven days of inoculation. He now had a laboratory isolation system with which he could quantify the putative herpesvirus and in due course antibodies against it. With these techniques he investigated the distribution of infection in wildebeest and its epidemiology in that species and its relation to cattle (9, 12).

The virus of MCF was found to be cell associated in all tissues of wildebeest, cattle and early passages in cell culture. However, it was found that the virus would grow in a line of calf kidney cells and that cell-free virus was produced after several cell passages. The availability of cell-free virus allowed two studies. First, Koch’s postulates were fulfilled, and second, collaborative studies confirmed visually that the causative virus was herpesvirus (8). Its properties and the pathology it produced suggested that it belonged to the gamma herpesviruses.

Walter’s work on MCF was considered by some scientists and himself to be his most original contribution to veterinary virology.

African swine fever

On joining the staff at Pirbright he was given responsibility for the field of African swine fever. While at Pirbright he described quantitatively the growth and spread of the causative virus in the pig after infection (14). He investigated the physicochemical properties of the virus; this led, in collaboration with others, to a characterization of the virus (10, 13). It turned out that the virus was unusual and different from any other known mammalian pathogen. After two years at Pirbright he negotiated a secondment back to Muguga, as Head of the Division of Virus Diseases, where he spent the next five years. This enabled him to pursue his main interest in the disease, its epidemiology in Africa. Early work by others had implicated the warthog as a source of infection for domestic pigs. However, it had never been possible to produce the disease by housing pigs closely with warthogs. This was a challenge to Walter, and after extensive studies on vast numbers of ticks collected from warthog burrows and warthogs he was able to show that the warthog was the main reservoir for the virus and that the virus could be spread by soft ticks (15). He also showed that the virus multiplied in these ticks and could be passed from one generation of tick to subsequent generations by both the female, by transovarial transmission, and the male at copulation (16, 17).
On returning to England he took up the post of Professor of Microbiology and Parasitology at his old college, the Royal Veterinary College. During his seven years in this post he continued to work on MCF, particularly using a rabbit model, but found collaboration with colleagues in Africa not productive. He instigated programmes not only on MCF but also on porcine cytomegalovirus and equine respiratory viruses. These programmes needed a new team of research workers, and perhaps his most important legacy of his time at the Royal Veterinary College was his much-valued mentoring of these young research workers, many of whom later filled senior posts at the college and elsewhere. He also remained a very much hands-on person in the laboratory. His prime interest was research. He found the demands of administration and teaching a burden, although typically they were tackled with thoroughness. These demands, but particularly the inability to undertake long-term research on important problems in animal health, led to frustration and the wish to return to a research institute environment. During his last two years at the Royal Veterinary College he had been a much-valued governor of the Houghton Poultry Research Station of which I was the Director at the time. It was with much regret that we had to accept his resignation from this post on his being appointed to the staff of a sister institute.

In 1978 he joined the staff of the Institute for Research on Animal Disease at Compton (now the Institute for Animal Health) as Head of the Department of Microbiology, where he remained until his retirement in 1983. He soon found he had taken on a department that had a large number of poorly focused projects on many unrelated diseases. He became frustrated with this situation because any attempt to do something about it was not supported by the Director. He therefore directed his energies to bringing the department up to date by, for example, designing and overseeing the building and commissioning of much-needed isolation accommodation for farm animals used in experiments. Attempts to integrate molecular biological expertise with many research projects were largely unsuccessful, much to his frustration. Over this period he was an important mentor to several staff and helped to initiate several important research programmes. The ever-increasing bureaucracy that was afflicting the management of science in research institutes increased the time he had to spend on administration of the department and was a major factor in his giving up personal research.

In retirement he continued to be active in many aspects of veterinary research and infectious disease, and he kept up with developments in science and the veterinary field. He continued to give advice on the eradication of rinderpest; for example he gave the keynote address in 1998 to the United Nations Food and Agriculture Organization’s Technical Consultation meeting on the Global Rinderpest Eradication Programme and also continued to publish papers on rinderpest and its eradication (18, 19). He was a rigorous but also sympathetic editor and reviewer of scientific papers.

One of his major contributions during his retirement was to equine virology through his chairing the Scientific Advisory Group of the Equine Virology Research Foundation (EVRF). The foundation supported work, largely on equine disease caused by herpesviruses, at several universities and institutions in the UK, Ireland and the USA for a period of 10 years. The
group decided strategy and made tactical decisions on research grant applications. The whole programme was deliberately multidisciplinary, and the group guided and coordinated the research programmes. This was greatly helped by the novelty of bringing all grant awardees together annually to present their progress and have a multidisciplinary discussion. Walter was the driving force of the programme, which was judged a scientific success as epitomized by a quotation from Dr D. Antczak of Cornell University: ‘The EVRF initiative has made the UK the most significant site for equine herpesvirus research in the world.’ The EVRF-funded programme resulted in more than 100 refereed publications at a cost of about £5 million.

He was also a member of several other committees in his retirement, such as the Scientific Committee of the Commission of European Communities, the Dangerous Pathogens Advisory Committee of the Department of Health and Social Security, the Veterinary Advisory Committee of the Horserace Betting Levy Board, and the Institute of Zoology, Scientific Committee of the Zoological Society of London. One of his last contributions was a valued submission of written evidence to the Royal Society inquiry on Infectious Diseases in Livestock in 2001. Unfortunately, increasing health problems in his latter years, which severely reduced his mobility, precluded him accepting invitations other than those that could be satisfied in writing. He never complained and was stoical about his afflictions, making little of them. He was often more interested in discussing the condition itself and what was known about it from a scientific point of view than the effect it was having on him.
Walter Plowright

Walter had a clear and incisive mind, which he maintained to the end of his life, applying rigour to all he did. He was a committed veterinarian but also had other interests, particularly gardening, to which he applied the same scientific rigour (figure 6). Another major interest was a well-equipped workshop for woodwork, where he spent many hours during inclement weather. He was a man of stature, acute and penetrating intellect and prodigious achievements. He was to many a kind and gentle man and was highly respected by colleagues and friends.

Sadly, in January 2008 a severe house fire, which incidentally destroyed most of his records, necessitated his moving to the Grange Care Home, where his health deteriorated rapidly. He was looked after devotedly by the staff and district nurses and he died peacefully.

HONOURS AND AWARDS

1965  J. T. Edwards Memorial Medal, Royal College of Veterinary Surgeons
1972  R. B. Bennett Commonwealth Prize of the Royal Society of Arts, London
1974  Companion of the Order of St Michael and St George
1977  Fellow, Royal College of Veterinary Surgeons
1979  Bledisloe Veterinary Award, Royal Agricultural Society of England
1981  Fellow, Royal Society of London
1984  King Baudouin Prize for International Development
       Dalrymple-Champneys Award, British Veterinary Association
1987  Fellow, Royal Veterinary College
1991  Outstanding Scientific Achievement Award, Animal Health Trust
1994  Gold Medal, European Society for Veterinary Virology
       Theiler Memorial Trust Lecture and Award, South Africa
1999  World Food Prize

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The frontispiece photograph was taken in 1984 by Godfrey Argent and is reproduced with permission.

BIBLIOGRAPHY

The following publications are those referred to directly in the text. A full bibliography is available as electronic supplementary material at http://dx.doi.org/10.1098/rsbm.2010.0018 or via http://rsbm.royalsocietypublishing.org.


