



The Royal College of Surgeons of England

“Something in the Genes:

Walter Rothschild, Zoological Collector Extraordinaire”

by Victor Gray,

Trustee of The Rothschild Archive

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A lot was expected of Walter Rothschild. And the expectation started early. It was there, one feels, beside the bed at the accouchement of Emma Rothschild and leapt immeasurably when she was delivered, on 8 February 1868 of her first child and it proved to be a son and heir.

Walter’s father, Nathaniel, known as Natty, was 27 at the time, the eldest of three brothers all engaged fully in the family business, a merchant bank. Baby Walter’s grandfather, Lionel, now nearly 60, was still firmly the head of the company which had been founded sixty years ago. It was by now, along with sister Rothschild banks throughout Europe, virtually without rival in the field of international finance, one of the two banks in the world (the other being Baring Brothers) which was pre-eminent in the business of raising loans for

governments. The Rothschilds were, at the time of Walter's birth, quite simply and almost certainly the wealthiest family in the world.

No wonder then that there was such rejoicing at the birth of the fourth and next generation, to take N M Rothschild & Sons into the twentieth century.

Emma, Walter's mother, was also a Rothschild, a second cousin of Natty and the daughter of the head of the Rothschild bank in Frankfurt, Mayer Carl.

Brought up in a strict Jewish household and educated to a high level, Emma shared her husband's essentially austere view of life, but she was to prove a patient and loving mother throughout the lives of her children, of whom there were three, Walter being followed by a sister Evelina, in 1873, and a brother Charles in 1877, nine years Walter's junior.

Miriam Rothschild, Walter's niece and biographer, records that as a child Walter was beautiful enough to earn comparison from his nursemaid with the infant Jesus. Certainly the young ten-year old painted by Millais seem to bear out the picture of a golden boy. As he grew, he shared his time between the family's town house in Piccadilly and the Wren mansion in Tring in Hertfordshire which Lionel had bought for Natty in 1872.

Emma was, from early on, concerned with Walter's health, but it is hard to read between the lines to see how far these fears reflected genuine problems and how far they were the over-sensitive concern of a mother who, quite apart from maternal feelings, was conscious that she was looking after, not only the

predestined heir to the Rothschild bank, but also, from the time of Natty's elevation to the peerage in 1885 - the first Jewish peer to be created - the some-day second Lord Rothschild.

By this time, there were, it is true, reasons for concern. Deemed too sickly to be sent off to school (his younger brother was in due course sent to Harrow) Walter was taught at home by a succession of governesses and tutors.

Problems began to emerge. It was not that his education or his response to it was in any way lacking. Nor was it that Walter was an unintelligent boy. Far from it. From an early age he showed evidence of an extraordinarily highly developed capacity for facts allied to an exceptional visual memory, capable, for example, of noting and remembering small differences in colour and shape. Where his imagination and interest were engaged, that capability would lead him to encyclopaedic funds of knowledge.

The problem was perhaps more that, in the golden cage of Tring, Walter had few opportunities to engage with other children. From early on, he developed a fairly alarming degree of shyness, flinching from eye contact and afflicted by a painful slowness of speech, made worse by a strangely high-pitched flute of a voice, a combination which would haunt him throughout his life. Puberty was not kind to Walter either. From Millais's golden 10-year old there developed a giant of a teen, 6'3" tall and closed in upon his own difficulties. Later in life he would expand, cruelly, to an unwieldy 22 stone.

This was no easy burden for an already painfully shy boy. Nor was it an easy burden for his father, whose hopes for his successor in the bank must have waned as the baby grew first into a shy boy and then into an awkward youth. Caught between, on the one hand, a father's increasingly obvious exasperation, verging at times on contempt and his mother's obsessive and smothering affection, it is little wonder that Walter retreated into himself. Not surprisingly perhaps he sought an escape route, and found it in the shape of the natural world, virtually on his doorstep at Tring. In her letters, Emma records, from early on, Walter's delight in animals, whether it was in the bantams at the Home Farm, or the shire horses which Natty bred to prize level, or a troupe of circus zebras and camels passing though Tring. By the age of seven he was catching butterflies and collecting stuffed animals and shortly after, was setting butterflies himself, probably taught by a figure who was to have almost as great an influence on his life's course as his father: Alfred Minall, a joiner on the Tring estate who supplemented his income by taxidermy. Walter was fascinated to see Minall at work and is alleged, by Miriam, to have gone home and told his parents he was going, with Minall's help, to build a museum. It is difficult to gauge what Natty's reaction to this prospect would have been but, by the time Walter was ten, the museum was a reality, his collections laid out neatly on shelves in a whitewashed garden shed in Albert Street, Tring.

It was, however, an important aspect of Walter's engagement with the natural world that he was as fascinated with the live as with the dead. The family had pet dogs of which they were hugely fond. There was an aviary at Tring with

exotic birds and the farm animals were nearby and visitable. But, in his early teens, Walter began to take on rather less orthodox additions to the menagerie, initially in the shape of a pair of dingoes, from which he bred, earning another stormily black point from his father when one bitch, over-protective of her cubs, went for and bit several of the horses in the stables. By the age of seventeen, the six foot three inch Walter was being packed off to Brighton for sea air with his German tutor, Dr Althaus, taking with him one of the dingoes, which he walked along the front on a lead, and an Australian opossum which slept under his desk during the day and caused mayhem at night. In due course, the grounds of Tring Park would be roamed by even more exotic creatures.

All this might have proved a passing boyhood interest, a means of identifying and taking ownership of a world separate from (and in part inimical to) his parents - in other words a teenage fad - had it not been for a developing sense on Walter's part that this was more than just fun. There was a discipline here. Perhaps in part he owed this discovery to an introduction to Albert Günther, the Keeper of Zoology at the British Museum's Natural History Museum in South Kensington. In 1881, when Walter was twelve or thirteen, Waterhouse's great new cathedral to the natural world first opened its doors to the public in South Kensington. Whether or not Walter had known the Museum in its previous manifestation at Bloomsbury, I like to believe that this magnificent new building claimed one of its first triumphs in the impact it had on this early teenager. Here was the whitewashed shed in Albert Street transformed into a palace of wonders. For Walter, surrounded by the

trappings of wealth, it would not have been impossible to think “I want one”. And if the Museum was to be an inspiration, Günther was to be a guiding hand. He was to become Walter’s friend and mentor, his letters giving him advice on how to build, design and run his museum and, most important of all, how to staff it. When Günther died in 1914, Walter wrote to his son that he felt as if he had lost a parent. He it was who instilled in Walter a sense of scientific purpose and was perhaps behind his determination to undertake a scientific training at Cambridge, where a degree in Natural Science had been instituted in 1861.

Magdalene College, Cambridge, where, after a brief spell at the University of Bonn, Walter went in 1867, accompanied by a small flock of kiwis, brought him under a new influence. Alfred Newton, now in his late fifties, was the University’s first Professor of Zoology and had pioneered zoological studies in an atmosphere still dominated by ideas of a classical and humanistic education. He was a distinguished ornithologist and a convinced Darwinist who claimed that Darwin’s work had come to him ‘like the direct revelation of a higher power’. Newton was then engaged in the research for his great work, his *Dictionary of Birds*, published between 1893 and 1896 and was collecting specimens. Among these were some South Sea birds the exotic beauty of which seems to have led Walter (at the ripe old age of twenty) to commission a collecting expedition of his own to Chatham Island off New Zealand and to Hawaii which would lead to his first scientific publication, on a new Pigeon of the genus *Carpophaga* discovered on the expedition and, within a few years to his first important publication *The Avifauna of Laysan*. Miriam Rothschild

attributes to this perhaps precocious and incautious outdoing of his tutor a growing disenchantment on Newton's part with his student. Certainly, later, the two men were to follow very different, and often inimical, scientific paths.

Walter left Cambridge after two years, scraping a third after a resit in the first part of his tripos. Why, with his undoubted ability to memorise and categorise, he did so poorly we do not know, but, whatever the effect on his parents, it did nothing to dent his own clear sense of destiny – and that destiny did not, in his mind, lay within a bank. That, nevertheless, was the path that was ordained for him, as it had been for his father and grandfather before him and at twenty-one he duly turned up for the first time at New Court.

It must have been clear from Day One that this was a job-match made in Hell, but for the moment the full enormity of the mistake may have been obscured, at least in Walter's vision, by a new diversion. For, whether to soften the blow of a life at a banker's desk, or to satisfy the urgings of his wife, who still doted upon her first-born, Natty gave Walter the only present he would have desired: a new museum.

This would be of a different order to the garden shed. It was to be designed by William Huckvale, a local architect whom Natty employed to build numerous estate buildings in and around Tring. The building would be divided into Public Galleries at the centre and a separate Students' Department for the study of entomology and ornithology, now Walter's two major obsessions. The contract to build the museum was issued on 20 March 1889, within a few weeks of

Walter's birthday. The cost was to be £3,300. Electricity would be installed. Within the building, the layout and arrangement were to be at Walter's exclusive behest. He was already a keen visitor to museums in Europe and he had an advisor on hand in the shape of Günther at the Natural History Museum. Clearly, even with his own voracious appetite for collecting, he could not hope in his public displays to attempt anything as comprehensive as the displays at South Kensington, so he opted for a rational alternative, described in *The Times* as "a nearly complete collection of the birds and animals of the British Isles and as regards the rest of the world, examples of the most interesting and sometimes of the rarest species, whether actually existing or recent or long since extinct". These included "one of the four known examples of the now extinct quagga", an Alpine ibex of which only one herd survived, "all that remains of poor Sally the chimpanzee, late of the Zoological Gardens" and the largest gorilla known. Walter always seems to have understood the importance of impact on his audience to capture their attention and imagination. The largest gorilla known was perhaps the first example, followed shortly, in 1893, by the first captured specimen of the white rhinoceros and, in due course, by the huge bull sea elephant, eighteen feet long and weighing in, when alive, at four tons. Its skin, packed in a barrel of salt, arrived in 1900 and, after being mounted on a special cane frame to avoid weight problems, became a focal point which still draws the eye of children and adults alike, a century on.

In all there were on display in the Museum 950 stuffed mammals, 3,000 birds, 200 reptiles 'stuffed and in spirit', 300 fishes, 1500 insects mounted and 1500

shells, corals, sponges and lower animals. The creatures were grouped within their genera in large numbers. No inch of space was left unused. No-one could fail to pass through without being struck by the sheer magical diversity of the world and its fauna, the very fact that lay at the heart of Walter's own fascination and the driving force behind the scientific labours that would occupy the rest of his life.

The research areas, which were Walter's real pride and joy, were equipped to the highest standard and there would be an extensive scholarly library to back up the work within. Walter's old friend and earliest mentor, Alfred Minall was appointed first caretaker and taxidermist. His wife was to be the cleaner. A William Barber was taken on to look after the heating system and to take charge of the live animals, for the museum was supplemented – an important fact – by the growing collection of live animals in the grounds nearby.

The whole was ready for opening to the public on the biggest day in the Tring calendar, that of the Agricultural Show, which fell on 11 August 1892. By the end of the day, many hundreds of visitors had passed through the doors. The Museum was now declared open 15 hours per week in summer and 11 in winter. Just over a year later, *The Times* reported over 30,000 visitors to date.

If Natty's hope had been that this new toy would satisfy Walter's ambition once and for all, leaving him free to concentrate on the proper business of a banker, then this must rank as one of his greatest misjudgements. Walter now had a compendium of attributes: a recognisable zoological education of a sort;

a core collection of some size and distinction by anyone's standards; a base from which to work, second only to the great national collection in its accoutrements; and, since he had come of age, an income of his own of Rothschildian proportions: the whole overlaid with passion and single-minded determination. Walter's new museum, far from being the achievement of a goal, was in fact merely a springboard.

From the very beginning of his collecting, Walter had managed to secure the enviable position of charging all his costs up to the Tring Estate Office. The advantage of this arrangement was that Walter's activities were at least under the eye of a responsible adult, the Estate Manager, Richardson Carr. He it seems to have been who, watching a new phase of explosive acquisition, asked Walter's mentor, Albert Günther to visit him and give him some advice on coping with the situation, which seemed to be rapidly getting out of hand. The publicly displayed collections were merely the tip of the iceberg. There were, for example, in the study collection, some 300,000 beetles awaiting cataloguing. Günther's advice was to bring in professional help, and he even went so far as to recommend, by way of a start, a German ornithologist, one Ernst Hartert. Like Walter, Hartert, then in his early thirties, was self-taught and had earned his living to date by undertaking collecting expeditions in Africa and India, selling the specimens he collected. Hartert joined Walter at the Museum, bringing his wife with him to Tring. He remained there for 38 years, proving to be a highly meticulous systematist; rising to become President of the Ornithological Congress at Copenhagen in 1926 and retiring reluctantly back to Germany in 1930 at the age of seventy.

Through Hartert, Walter was also now introduced to an entomologist, Karl Jordan, a thoroughly educated zoologist who was then teaching maths, physics and natural history at the Hildesheim School of Agriculture. He and his wife arrived in Tring in 1893 and stayed with Walter until his death in 1937. Tring provided him with the opportunity to follow his true passion and vocation, the description and systematisation of insects. He rose immediately to the challenge of the 300,000 beetles, describing them all within a year and going on to publish some 400 species new to science which he found among them. He seemed undaunted by Walter's decision, just two years after his arrival, to shift his attention wholeheartedly to the Lepidoptera, on the grounds that they provided a better opportunity to study the effects of evolution. Like Hartert, Jordan became a recognised, if not always admired, figure in his field, and a mover and shaker: in 1910 he founded the First International Congress of Entomology and eventually became its Honorary Life President, after 45 years of work on its behalf.

This was the team which was now to allow Walter's ambitions full rein: a trio which, throughout forty and more years remained locked in study and common purpose, united by their common respect and passion for the business of opening up the world of natural history to greater and greater scrutiny through the medium of accurate, punctilious and remorseless scientific investigation and description.

Natural history had enjoyed a huge expansion of general public interest during the nineteenth century. Back in the 1820s and 1830s, there had been a wave of popular interest, generated in part by the development of cheaper mechanised printing which in turn led to a rash of illustrated books. At the same time, the growing trend towards the establishment of societies of common interest, which had developed during the later 18th century, spread outwards to reach a wider proportion of the public. The same movement which saw the development from the 1820s of the Mechanics Institutes for the spread of profitable and educational entertainment for the artisan classes saw simultaneously the development of both national and local societies devoted to particular subject areas – including, commonly, natural history. The Zoological Society of London was founded in 1826, the Entomological Society of London in 1833. On their back came a wave of journal publication, which developed and deepened the scientific credibility and worth of this interest. The spread of societies continued throughout the century. By 1873 there were said to be 169 local scientific societies in Great Britain and Ireland of which 104 were field clubs for the study of natural history. After this first wave of new organised interest in the 1820s and 1830s, there followed a further, less organised and more broadly based phase in the 1850s when, with the spread of the railways, providing the opportunity for people to explore the countryside more fully, and with ever wider access to cheap print, a fashion for the close scrutiny – and regrettably the pillaging – of rock pools and birds' nests developed apace.

At the same time, popular books and journals were exposing the public far more widely to the wonders of an ever-shrinking world. Writers like the Revd. J G Wood and Frank Buckland were among the best-sellers of the period, if not the century. Wood published his first book *The Illustrated Natural History* in 1851, followed it up with *Common Objects of the Seashore* in 1857 and produced a flood of titles until his death in 1889. His *Common Objects of the Country* sold more than 100,000 copies in a week. As editor of the *Boy's Own Magazine*, his influence shows in the many articles, illustrated with excellent coloured plates, which encouraged young boys to go out with collecting jars and microscopes). Frank Buckland regarded himself as the bridge between serious zoology (he was himself a surgeon and anatomist and became an expert on sea fisheries). His four volumes of *Curiosities of Natural History*, published between 1857 and 1872, stuffed with breathy anecdote, did perhaps more than any other volumes to introduce the public to the strange wonders of the unfolding world. A master of the art of popularising science, he remained nevertheless serious in his scientific intent. In 1860 he was a prime mover in the foundation of the Society for the Acclimatisation of Animals in the United Kingdom, dedicated to the investigation (by cooking and eating) and local domestication of new sources of food from around the world. Buckland's and Wood's works would have been schoolboy reading for Walter Rothschild and it is sometimes difficult to read of Walter's eccentric exploits with live animals without thinking of Buckland.

One natural consequence of this rise in popularity was a desire to see more of the animal kingdom, either in the flesh (in zoos) or, at least, in remodelled

form, as stuffed skins (in museums). The opportunities for this at the beginning of the century had been limited. The British Museum's foundation collections, then housed in Montagu House in Bloomsbury, had, from the time of the original bequest by Hans Sloane in the middle of the 18th century, included natural history specimens. There they had been worked on by Daniel Solander who had brought as much Linnaean order to the collection as one man could bring. But by the time W E Leach joined the Museum as a keeper in 1813, the collections were in such a poor physical state that he resorted to thinning them by way of regular bonfires or 'cremations' as he called them. The development of scientifically considered displays and detailed research was essentially held back until the middle of the century by the low priority accorded to natural history by the Museum's senior management. Speaking of the audience for natural history displays, Anthony Panizzi, the Librarian head of the Museum, argued before a Select Committee in 1860 that "the fewer people of this class are attracted as visitors the better".

There had of course been, and continued to be private collections of natural history, perhaps the largest and best known of them in the 18th century having been the collection of Lady Margaret Cavendish Bentinck, wife of the 2nd Duke of Portland, who had spent 50 years building an enormous collection displayed in a museum with botanic garden and menagerie at Bulstrode in Buckinghamshire.

In London, the collection of Sir Ashton Lever, a Lancashire landowner, had been displayed at Leicester House in Leicester Square from 1775 until 1785,

when, having overstretched his resources by his passion for collecting, he was forced to sell, using the means of a public lottery with the entire collection as a prize. The winning ticket was won by a dentist, Mr Parkinson (after whom, incidentally, the disease is named) who moved it to a purpose-built hall in Albion Street across Blackfriar's Bridge, a site which proved too far off the beaten track to attract enough paying visitors. He closed the collection in 1805 and sold it off. This was followed in 1809 by the opening of the London Museum of Natural History, put together by William Bullock, a London goldsmith and showman and exhibited for ten years in the Egyptian Hall in Piccadilly. This too eventually went to auction.

Other zoological collections in London, like the Zoological Society's own short-lived museum and John Hunter's own collection at the Royal College of Surgeons were only accessible to specialists and/ or members. There was no thought of making them available to a broad public audience.

By the time Walter's museum opened in 1892, the position had changed fundamentally. The extension of the franchise and the acceptance in the Education Act of 1870 of a responsibility by government for a measure of education for all, combined with the obvious and dramatic impact of such broadly aimed educative spectacles as the Great Exhibition, meant that, by the 1890s, there was a broader acceptance – certainly still, in some quarters grudging - that it was a proper expenditure of public finances to support educational institutions such as museums and galleries. In fact municipal authorities had been empowered as early as 1845 to fund and maintain

museums. Even while Walter's Museum was being built, a new Museums and Gymnasiums Act provided for the raising of a twopenny rate to finance museum building and collections. In the field of natural history, the opening of the new Natural History Museum in South Kensington and the display of its collections in a way which combined popular appeal with a measure of education. The museum had been revitalised and given scientific credibility by people like Dr J E Gray, the Keeper of the Zoological Branch of the British Museum from 1840 who succeeded in building up what was acknowledged to be the largest collection in Europe, outstripping longer established rival museums in such places as Paris and Berlin and by Richard Owen, the Head of the Natural History Department from 1856 who drove relentlessly for a new building in the teeth of opposition from Panizzi.

The impact on collections and museums previously funded privately was significant. Now there were many newly added alternatives at a more local and public level. Furthermore, the once chaotic natural history department of the British Museum now demonstrated a disciplined, scientifically credible ethos which made this the pre-eminent place of choice for either donating or selling specimens or whole collections. All in all, for the private collector, the buying and acquiring power of publicly funded museums made the game far more difficult. The building work at Tring was therefore moving against the tide. Of similar private collections, Lord Derby's 20,000 zoological specimens had long ago, in 1851, been bequeathed to the Liverpool Museum. Lord Walsingham's collection of 260,000 microlepidoptera at Merton Hall near Thetford was destined to go to the Natural History Museum in 1910; and the

Hill Museum at Witley in Surrey, built up by the City stockbroker and hobby lepidopterist James John Joicey closed at his death in 1932, the collections and their curator being transferred to South Kensington.

What gave Walter's venture its power to swim against this tide was perhaps its complex aims and its sheer physical size – backed up, importantly, by more hard cash than any other individual or institutional collector in the field (and in that I include the Natural History Museum) could bring to bear at the time. What the public saw was a well organised display providing both education and entertainment and enhanced by the diversion of a possible glimpse of the live animals which, to his father's consternation, were being gathered together in the grounds of the park and in pens around the Museum: at various times, kangaroos, zebras, wild horses, a tame wolf, wild asses, emus, rheas, cassowaries, wild turkeys, a marabou stork, cranes, a dingo and pups, a capybara, pangolins, deer, kiwis, a spiny anteater, giant tortoises, a monkey, as Miriam Rothschild lists them. The sight of Walter riding on one of his beloved giant tortoises must, for the visitor, have added eccentricity to exoticism, a heady mix. But the aspect of this living menagerie which the public would not have easily appreciated was that it represented, for Walter, an important aspect of his scientific work, enabling him to study the whole animal - its habits as well as its anatomy and taxonomy. In preparing his 1899 monograph on the *genus Casuarius*, the cassowaries, for example, Walter attempted to collect together all the species he could assemble alive at Tring. There can be few scientific studies of a bird which have been able to add, alongside the detailed description of habitats and sub-species colour

variation, the fact that “The eggs are excellent food. Owing to their size it is difficult to boil them well in the shell, and besides it requires a number of persons to finish one; but for scrambled eggs, omelettes, cakes, and other purposes they are, like those of the Rhea and Emu, most excellent”. This is Walter emulating, as I often feel he does, Frank Buckland’s earlier almost showman-like approach to zoophagy, yet it would have been done without a wish for what might now be called ‘celebrity limelight’ from which Walter shied. Even the celebrated occasion when he rode in his trap drawn by a team of zebras along Piccadilly and into the forecourt of Buckingham Palace would have, for Walter, been more of a publicly conducted scientific experiment, to disprove the previously held assumption that zebras were untameable, than a piece of self-publicity.

For at the end of the day, for all the careful arrangement of the public galleries, Walter’s real interests lay in the private study rooms which lay behind the Museum, out of sight of the public, . Above all else, Walter wanted and needed to be taken seriously as a zoologist.

At the time the Tring Museum opened, the scientific world was still reacting to the tremors of the publication of the *Origin of Species* more than thirty years before, in 1859. Of course, the first bitter battle between the Darwinists and the defenders of a divinely conceived universe had passed - though not so long ago as one might think. Richard Owen, an opponent of Darwin and the Head of the Natural History Department at South Kensington at the time of the Darwinian explosion, had, in the early 1880s, still planned to lay out the

Central Hall of the new Museum to demonstrate the pre-Darwinian notion of a range or group of variations in organisms developing from a single original divine archetype. Only with Owen's retirement in his eightieth year in 1883 and the appointment of Sir William Henry Flower in his place was the scheme abandoned in favour of an arrangement reflecting more fully the newer evolutionary theories. At the same time, Flower, a wholehearted Darwinist, significantly placed a statue of Darwin at the head of the main staircase, as if to stare Waterhouse's figure of Adam in the main entrance right in the eye.

Walter was in fact, in his preoccupations, very much a child of the Darwinian revolution. In his zoological training, he had been guided by both Günther and Newton, both convinced Darwinists. Together with Hartert and Jordan his whole focus was on taxonomy and phylogeny, the study of variations in anatomy and physical form to assess the process of variation through evolution across time. It was to this that they devoted themselves for forty years or more. It was for this that Walter was so obsessed with the collection of sheer numbers of specimens, arguing that only by comparing very extensive series of examples of the same species or sub-species was it possible to be sure about the fixity, extent and generality of specific manifestations of variation. In fact, the controversial new approach of trinomialism, for which Tring became either famous or notorious according to taste, was an attempt to refine the process of description in order to respond more accurately to the manifestations of the Darwinian evolutionary process. I will say more about this shortly.

While other, newer strands of research developed in the zoological world – new interests in morphology and anatomy, a shift to an interest in the behavioural patterns of groups of animals and birds – Walter and his colleagues remained largely immune to these trends. Walter's place was essentially always at the bench, alongside Hartert and Jordan, contributing to the work of defining and revealing the patterns of relationship between species for the benefit of scientific understanding. All three had the scientific training and discipline to undertake the necessary study of specimens and the publication of the results. But what Walter alone could bring to this work was the financial ability to bring together the huge number of specimens that descended on Tring: two and a half million butterflies and moths, 300,000 bird skins, 200,000 birds' eggs, to name just the principal components.

It is hard to absorb the scale of these numbers, but the logistics of collection which lie behind them is, to me, still more staggering. Walter was employing collectors and arranging expeditions, as we have seen, from the time he was up at Cambridge. He continued throughout his life. The journey for each one of his specimens, ending in a drawer in Tring, begins in some remote part of the globe and involves, in each case, a collector, a packer, a sequence of transporters, in some cases a dealer, a taxidermist or setter in the case of insects and, finally, one of the Tring trio to identify, label, record, file and perhaps publish. All of this repeated millions of times. And at the heart of this, one man's drive, organisational ability and finance.

There had perhaps never been a better moment in history for this to be undertaken. It was not simply that the whole process of exploration and colonisation was accelerating to a point where the white spaces on the globe were shrinking year on year. It was equally significant that, perhaps for the first time, the man with resources could conceive a scheme on a global scale and actually have a chance of pulling it off. As a Rothschild, Walter would have been used to hearing his relatives in business talking in such global terms: their day-to-day business involved resources and finance for virtually every corner of the globe. And as a Rothschild, he had access – or so it seemed – to unlimited resources.

Moreover, the infrastructure was there as never before. For as long as there had been collectors – whether of natural history or ethnography or art – there had been people prepared to seek out and bring home for them materials from around the world, but by the end of the nineteenth century, the vast machinery of colonisation and imperial tenure had placed around the world large numbers of people either imbued with the excitement of seeking out untrodden paths or else seeking some relief from the tedium of the life of a colonial administrator or missionary or trader. Equally, at home, the rise in popular interest in natural history across the century had built up an infrastructure of dealers who made a living as intermediaries between the explorer-trappers and the builders of collections. And there were taxidermists and setters who would turn tightly bundled bird-skins received from the outback of Australia or the big cat shipped in a barrel from the African plains back into as close as possible a resemblance to its breathing original.

Though most of the records of the Tring Museum during Walter's life have long since disappeared, we are fortunate in that one very extensive group of correspondence from Walter's network of collectors, dealers and taxidermists has survived in the Natural History Museum. To read these letters now is to be plunged into a world somewhere between the command-room of a great, but ultimately ungainly, military campaign and the *Boy's Own Paper* - with characterisation by Dickens. There is, first of all, the network of dealers, operating throughout Europe, with whom Walter was in regular contact, men like Adolphe Boucard of 13 Rue Guy de la Presse, Paris and 225 High Holborn, who in one year alone offered to Tring – for an appropriate price – Lepidoptera from Assam in India, Mexico and Central America, Syria and Haiti, 744 birds from Morocco at five shillings a piece, the collection of C. Ward, a specialist in butterflies and moths, chiefly African and Madagascan, in seven fine mahogany cabinets each of 198 drawers and, last but not least, a barrel of Australian echidna in spirit. There are the so-called 'naturalists', men like Albert Green, "taxidermist and mounter of all kinds of birds and animals, skins etc., dealer in live birds and cages, foreign shells, feathers, glass shades, etc.", of Verulam House, Bournemouth or Edward Gerrard, naturalist, of Camden Town: "skins, heads, rugs and ornamental cases mounted in the best styles".

There are professional colleagues or opposite numbers, both builders of collections, private and public, like Dr Brunchorst of the Bergens Museum of Natural History writing to Walter to tell him the Museum had duplicate whale

and dolphin skeletons to sell or exchange, and offering to boil them for him so they would be ready for mounting. And there are the hunter-collectors themselves, in varying degrees of full-time employment as such. For some collecting was a passion which provided incidental income and the chance to correspond with others of like interest, men like E.C. Stuart-Baker, an officer for thirty years in the Indian Imperial Police Force, stationed in the North Cachar Hills, who wrote to Walter in 1893 to tell him of his work on compiling a catalogue of the birds of North Cachar and of his collection of 650 eggs, from which he offered Walter any duplicates he might want. (The exchange of duplicate specimens was, incidentally, a frequent method of trading.).

For others, collecting might provide a hobby sideline with the hope of some income at the end of the day. There was William Wilson, a medical missionary in Madagascar, one of many who wrote to Walter offering their services while travelling and men like the ill-starred James Dykes, importer of bloodstock and sporting dogs to South Africa, who, in a moment of misdirected inspiration conceived the idea of offering his services to Walter as a catcher of specimens while on a projected trip 'up-country' in 1892. Dykes' attempts over two years to satisfy his patron were met, first by near shipwreck off the Ushant, then by burns sustained in an explosion in the ship's hold off Cape Verde, then by the bite of a puff adder while on the trek up-country, followed by a contracted fever which nearly killed him. To cap it all he found himself deep in the bush and caught up in the Matabele rising against Cecil Rhodes's British South African Company. I have seldom read a more bitter or more frightened letter. Than the pencilled note Dykes scribbled to Walter in an

increasingly desperate hand by the light of a camp-fire on sheets torn from a rough notepad, sleep impossible because of the confident expectation of an attack the next day by the Matabele. Eventually, having survived, he shipped off to Walter a rather battered collection of six headless skins, one leopard, 175 birds, two tins of butterflies, one bottle of beetles, one koodoo, one buffalo, a pair of giraffe, two pairs of stable antelope, two pair of Roan Antelope and a few moths, with an elephant head to follow, only later to discover the best of these specimens on display in the Pretoria Museum. They had been pilfered en route by the riders he had paid to take them to the coast and sold to that museum for £43. The whole venture ended in poor James Dykes embarrassingly in debt to Walter for the expedition costs which he had advanced him.

Others made collecting a full-time employment. Among these, clear rules of engagement were devised. The funding of expeditions was often a matter for delicate handling, the supplier needing to keep sweet a number of competing interests among his clients. Charles Hose, for example, a Resident Officer in the service of the Raja of Sarawak, when setting out for an expedition in Borneo in 1893, wrote simultaneously to Oldfield Thomas, the mammals specialist at the Natural History Museum and to Walter, sending them each a map and asking them to mark up the areas in which they would like him to collect specifically for them: this, as he wrote, "to avoid animosity" later. The more practised collectors were wise enough to tie up the finances in writing well in advance of setting off. The German collector, Oscar Baron, who collected in Central and South America from a base in San Francisco, entered

into an agreement with Walter before setting off for Peru in 1893. Walter agrees to take eight specimens of each moth collected, paying sixpence for smaller specimens and a shilling for large. Of beetles eight each, paying 3d. for anything over half an inch in length, smaller ones to be agreed upon on Baron's return. If Walter asks for larger species, he may take as many as he wishes on agreement of a mutually acceptable price on completion of the expedition. The costs would be payable at the beginning of January 1895, with interest chargeable from that date at 4%. In the event the collection did not reach Tring until December 1895, Baron having been trapped in the civil war then raging in Peru, and then struck down by a near-fatal fever.

Walter would, I am sure have appreciated the correct formality of these agreements. Much of the correspondence features speculative approaches to him expecting high prices on the basis of the name Rothschild and professing exaggerated surprise, even disgust, when lower sums are offered. Despite his buying power, Walter was no walkover.

I have dwelt longer than I should on these collectors because of the richness of what this correspondence tells us about an informal network which spread like a mycelium across the face of the globe in the last years of the nineteenth and the early years of the twentieth century, a rickety ad hoc global infrastructure which fed on the very mixed personal motivations of an extraordinary range of people but supplied endless streams of material to a scientific community and to a public with a virtually insatiable appetite to know the world now being drawn more and more firmly on the pages of their

atlases. It was a network which, from discomfort and danger, provided the raw material from which science made great advances of understanding and knowledge. It deserves much more attention.

Back in the clinical silence of the study rooms at Tring, Rothschild, Hartert and Jordan set out to do justice to this unstoppable influx of specimens.

That work lay essentially in taxonomy – the scientific classification of each specimen assigning it to its proper place in the family tree of genus, species and sub-species. This was the daily labour at Tring, repeated relentlessly and painstakingly across the tens of thousands of specimens which arrived, particularly in the hope that new, previously undiscovered or undescribed material would come to light – as it did at a surprisingly frequent rate. But recognition and description were without worth unless this new information was promulgated. Walter's earliest publication – the description of a new pigeon of the Genus *Carpophaga* - was published in the *Proceedings of the Zoological Society of London* in 1891 and in 1893 his description of three new birds from the Sandwich Islands was published in *Ibis*, the journal of the British Ornithologists' Union, first published in 1859. But this would be Walter's last scientific piece for *Ibis*, for the editor of that journal, Philip Lutley Sclater was a confirmed opponent of the developing fashion for trinomialism of which Walter, and with him Jordan and, most ardently, Hartert, were convinced proponents. Trinomialism is the adoption of a third element following the name of the Genus and Species to indicate a particular sub-species which carries a consistent feature or features differentiating it from

others and occurring across generations in a specific locality or region. Its first use is variously ascribed to Carl Sundevall, a Swede, in 1840 and Hermann Schlegel, a German in 1844. Both were ornithologists. For the majority of the European establishment, however, this novelty was regarded as questionable if not ridiculous – even more so when it became adopted by American ornithologists in the 1880s. The use or non-use of the trinomial element became a hot potato, burning with a heat we now find it quite impossible to understand. Faced, in Sclater's rebuttal, with a huge early blow to his projected publication of new species and subspecies at Tring, Walter fell back on the cushion of his own finances and made the decision to launch his own journal. *Novitates Zoologicae* was forthwith conceived and delivered, its first edition appearing in January 1894, within months of his last piece for *Ibis*. It would be published regularly until 1939.

It opened with a statement of editorial principle which amounted to a clarion call – unequivocal and without diffidence - for the espousal of the trinomial. A further three parts of *Novitates* had appeared before the end of the year, making a total of 722 pages, the lion's share written by the trio at Tring. Together in Volume One they published 22 new Genera and 342 new species and sub-species, a rate of publication which would rarely reduce across the lifespan of the journal.

Want of time prevents me from pursuing in greater detail the later development of the Museum. While the scientific work continued unabated until the very end, there were times when that even and unrelenting pace was

only maintained in the teeth of a number of storms which broke around Walter. The largest of these occurred in 1907, when Walter was in his late thirties. Miriam Rothschild believes the immediate stimulus was blackmail, occasioned by Walter's undoubted weakness for attachments with young ladies, one of which had resulted in the birth of an illegitimate daughter. Whether or not this was the financial straw that broke the camel's back or whether it was Walter's undiminished and torrential museum spending, the pent-up wrath of creditors inevitably burst upon the wider Rothschild family, particularly on Walter's father and his long-suffering brother Charles. The enormity of the situation gradually became clear: Walter had already mortgaged a good part of his own estate and there was a growing debt on the Museum's accounts. The net result of this was the removal of Walter from the Bank where, for eighteen painful years, he had, day in day out, endured tedium and the knowledge of his own inadequacy. At the same time, the basis of his own finances and those of the Museum were changed and constrained within tighter limits. That Walter wore that financial corset uneasily is self-evident. The leopard could not change its spots overnight. But with his debts cleared and a trust established under the watchful eye of Charles, an uneasy financial peace settled again, with annual expenditure set at an average of £7,000. Astonishingly, the compensation prize for Walter seems, once again, to have been large. Two new and very substantial extensions were built on the Museum to house the growing insect and bird collections, bringing the total floor space of the Museum to one and a half acres.

For Walter, Hartert and Jordan, the work virtually disregarded the passage of time, but outside the walls of the Museum the years took their toll. Natty died in 1915, leaving Walter to become the 2nd Lord Rothschild. Brother Charles, thrust into a central role in the bank by Walter's departure and longing, like Walter, to spend more and more of his time on his passion for insects, laboured on, increasingly troubled by illness and depression. He eventually took his own life in 1923. Walter was now virtually under the control of his ageing mother and his strong-willed sister-in-law, Rozsika, who together, and with deep affection, attempted to keep him on the rails. But in 1932 finance again reared its head, the problem being, in Miriam's eyes, still occasioned by persistent blackmail. In 1932 Walter took the amazing step of selling his bird collection, some 280,000 skins, to the American Museum of Natural History for \$225,000 dollars, a sum instantly given by Mrs Gertrude Vanderbilt Whitney. Walter's undoubted first choice for buyer would have been the Natural History Museum in London, of which he had been a trustee since 1899, but the sums required could not be raised. The birds were duly shipped to America. Whatever the underlying reason, Walter had, in character, been quite unable to discuss the matter with any of his family or with Jordan. They learned of it first from the newspapers. Back in Germany, Hartert, now retired, is said to have wept to see his life's work leaving Tring and crossing the Atlantic. The scale of the loss to British ornithology can be gauged by the fact that the Natural History Museum's ornithological collections today consist of roughly a million specimens. Walter's collection would have added roughly a third to this number making it by far the most authoritative and extensive in the world.

Though he managed to retain his collection of bird's eggs, his ornithological library or and his beloved big birds – the ostriches, cassowaries and rheas, some of which Walter must have remembered running around the park at Tring - there was no doubt of the extent of the blow to Walter, now in his sixties. Five years later, he was dead. The loss of his 92-year old mother in 1935, his life-long companion and supporter against all odds, must have been a second cruel setback. A fall soon afterwards left him severely limited in mobility. He died in 1937 at the age of 69. Before his death Rozsika had persuaded him to make a living gift of the Museum to the Natural History Museum (which had finally attained its independence from the British Museum in 1930) offered on the condition that it should continue to be a place for the study of systematic zoology. He did not live long enough to see the transfer. It was the largest single gift ever offered to the Museum and its acceptance required specific legislation. Today the conditions imposed at the time have been honoured, and though the Museum remains much, but not rigidly, as Walter left it, a living museum of late 19th century museums, behind the scenes the functions have changed. The grounds now house the Museum's complete ornithological departments and collections, moved to a new building in the early 1970s on the site of Walter's entomological wing. In return, the Rothschild lepidoptera and other insects have been moved to South Kensington. On the whole Walter would have been pleased.

There are two ways, it seems to me, of assessing Walter Rothschild's achievement at Tring. The first interests me primarily as a student of matters

Rothschildian, a personal assessment which takes into account the man, his place within a family and his needs as an individual, and looks at the motivations and aspirations which these gave rise to.

If there is such a thing as a collecting gene, it lodges deep within the Rothschild family. Walter's grandfather, Lionel, was a discerning collector of paintings. At home at Tring, Walter would have been surrounded by the parts of his maternal grandfather's collection of gold and silver objects inherited by his mother. His great-uncle Mayer had filled nearby Mentmore with the most extravagant of collections. During his youth his uncle Ferdinand, down the road at Waddesdon, was doing the same with impeccable taste. Where art did not provide the obvious target for a Rothschild's attention, a surrogate was found: in France, during Walter's growing years, James was collecting rare and fine books, Henri was collecting autographs and death masks, Alphonse was collecting and writing about postage stamps, while Arthur, smitten with the collecting habit but perhaps a little limited in his vision, resorted to cigars, hair-ribbons and neck-ties. If this was not a gene implanted by nature, then it was certainly a matter of nurture, a demand passed down the generations and calling for a response from each. No matter how wayward, un-Rothschildian and ultimately disappointing Walter may have seemed to his father, in his collecting he was following in family tradition as assiduously as anyone before him. Trying to escape from the world of adult relationships which he found so difficult, Walter had, ironically, resorted to one of the most conventional and oft-repeated Rothschildian ways of demonstrating worth – and in so doing had outshone them all.

Furthermore, in a curious echo of Darwinian adaptation, the collecting gene, now imbued with Walter's scientific variant, was handed on. Walter's brother Charles, nine years his junior, grew up from his earliest years in the presence of butterfly nets and collecting jars. While at Harrow he was writing a treatise on the local butterflies and turned in adulthood to an abiding interest in fleas, of which he accumulated a vast collection of a quarter of a million, now in the Natural History Museum. Charles's children, growing up at Tring, in the presence of a flea-mad father and an uncle with a back-garden museum and a zoological park, could scarcely escape. Victor, who succeeded Walter to the title of Lord Rothschild, became, at Cambridge, a research embryologist and later Chair of the Agricultural Research Council and Head of Research for Shell. Miriam – later Dame Miriam Rothschild – took up the flame of her father's work with fleas, completing the catalogue of his collection and going on to a lifetime's work as a parasitologist. Here, in this one perhaps unlikely corner of the Rothschild family tree was the makings of a small but creditable scientific dynasty.

My second assessment would be a more conventional estimate of the achievement of Walter's Tring Museum in broad scientific and social terms. Walter's collection was, quite simply, the largest single accumulation of zoological specimens ever collected by one man. But it was far more important to Walter and his colleagues that their work would receive scientific credibility and respectability. Acceptance and honours were slow in coming during their lifetimes, but the years that followed have affirmed the relevance

and significance of what they achieved. Of the two distinctive principles which underlay their approach to the work behind the scenes at the Museum, the first was the development of the theory and practice of trinomialism. By the time of Walter's death this had achieved the ultimate accolade of becoming everyday scientific practice. Nothing would have pleased him and his colleagues more. The second was the accumulation of huge series of specimens of single species and sub-species, which has ensured that the collections continue to have scientific import today, a value enhanced by newer approaches to scientific investigation opened up, for example, by studies of local eco-systems before and after the impact of man-made depredations, and by studies now based on DNA.

Walter's death marked, I think, a significant moment in British museum history. The passing of the Tring Museum into public hands was perhaps the end of that long slow transition from the privately built and financed natural history museum to the age of almost universally publicly-financed institutions. From the point at the beginning of the nineteenth century when the private enthusiast and a limited number of public museums ran side by side in the race to establish collections, the position had now tipped firmly to the public side. The days when the public museums had been largely staffed by patronage had long since passed. The development of natural sciences courses in the universities had now made available numbers of scientifically trained curators to staff them. It was difficult for these new men to know how to take the trio at Tring. They were neither fish nor flesh, working outside the establishment and adhering coherently to an approach which was, initially at

least, outside scientific orthodoxy. Nevertheless, they were invariably generous in putting their collections at the disposal of fellow scientists and year on year they produced evidence, at a pace hard to emulate in a large institution, of real and worthwhile scientific output, eventually amounting to over 1200 books and papers published and over 5000 newly described species.

Talented populariser, in the tradition of Buckland and Wood, or important contributor to the emerging evolutionary map; spoiled eccentric or far-seeing scientist; vestige or visionary: at the end of the day, I suspect there is room for all these perspectives and more within Walter's generous, even opulent, frame. But, if there is room for many verdicts, the sum of them all seems to me to be this: that there was never anybody quite like Walter Rothschild and, even more certainly, in our own time there never could be.

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