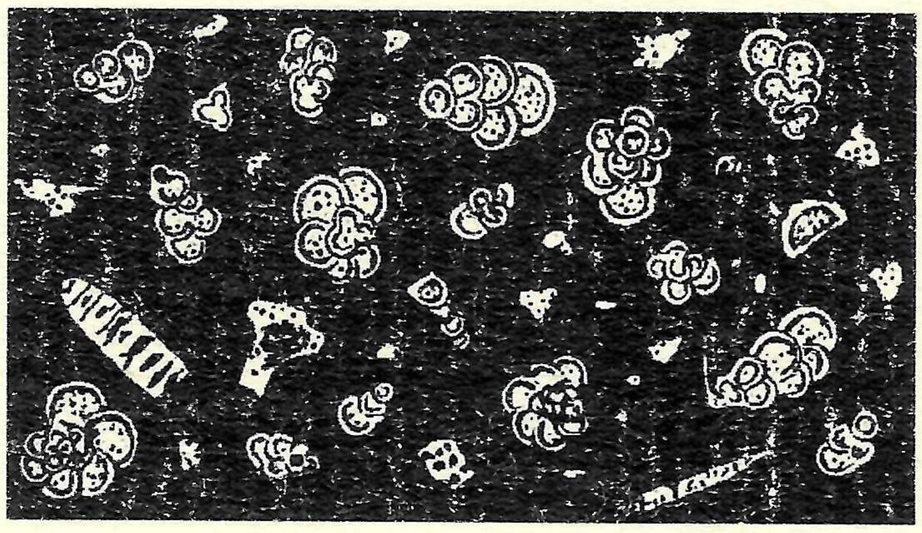
"THE BEAUTY AND MYSTERY OF THE FORAMINIFERA"

THE SCIENTIFIC RESEARCH OF EDWARD HERON-ALLEN FRS

RICHARD L. HODGKINSON
AND JOHN E. WHITTAKER

BASED ON A TALK DELIVERED ON THE BEACH AT WEST STREET, SELSEY, TO MEMBERS OF THE HERON-ALLEN SOCIETY AND GUESTS OF THE WEST SUSSEX COUNTY COUNCIL, FOLLOWING THE UNVEILING OF A PLAQUE IN HONOUR OF EDWARD HERON-ALLEN BY IVOR JONES, 15TH JULY 2002



Opusculum IV
Heron-Allen Society

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R. Hodgkinson

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"The Beauty and Mystery of the Foraminifera".
The Scientific Research of Edward Heron-Allen FRS:
by Richard L. Hodgkinson and John E. Whittaker
(The Natural History Museum, London SW7 5BD).

Based on a talk delivered on the beach at West Street, Selsey, to members of the Heron-Allen Society and guests of the West Sussex County Council, following the unveiling of a plaque in honour of Edward Heron-Allen by Ivor Jones, 15th July 2002

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Cover : How the "obsession" began. An illustration of... "some of the grains of a piece of Chalk" (including foraminifera) from Geikie's *Geology*. Magnified x60.

HERON-ALLEN, THE SCIENTIST

INTRODUCTION

To most members of the Society, Edward Heron-Allen will be best known for his many interests, including and encompassing the law, the violin, the occult, writing ("esoteric" fiction, as well as the definitive history of Selsey), translating Persian literature, and horticulture. What might, perhaps, not be as well known is that this remarkable polymath had also a rewarding scientific career spanning almost fifty years working on the Foraminifera, during which he obtained fellowships of several notable London learned societies, namely the Royal Microscopical Society, the Linnean Society, the Geological Society, and the Zoological Society, culminating in his election to the Royal Society in 1919. For a summary of the breadth of his activities there is no better one than that given by the man himself (under the pseudonym Christopher Blayre[1]), recently re-published in 2000 by our Society.

One of the Heron-Allen Society's ultimate aims is to produce a definitive account of his life. In this *Opusculum* we seek to address part of that remit and describe how his "obsession" with the Foraminifera began, and to review for the first time, the major scientific work he accomplished in this field of research. A full annotated bibliography of his foraminiferal publications is published elsewhere (Hodgkinson and Whittaker, 2003).

THE INITIAL SPARK

Heron-Allen first became interested in Natural History at the age of 12, whilst at Elstree Preparatory School, where in samples of shore-sand he had found small shells which were not molluscs, but made by single-celled organisms (protists) called foraminifera. Foraminifera have a single- or multi-chambered shell (called a test), usually made either of calcite or of mineral grains cemented together by the organism. They are often highly ornamented and possess one or more apertures, through which the cytoplasm emerges for locomotion, catching food, test-building and for reproduction. To the microscopist they are aesthetically very beautiful, as well as being eminently useful to the scientist. They have a long fossil record (of at least 600 million years) and are valuable not only for dating sedimentary rocks but also for reconstructing their environments; and as a result are much used in the Oil Industry. At the present day, foraminifera are very common in all manner of aquatic environments from brackish salt-marshes to the deepest oceans.

In his copy of Geikie's *Geology* (Fifth Edition of 1931) is a little handwritten inclusion..."it is this page [17] and page 80 which arrested my attention in 1873 and caused me to become a student of the Foraminifera". On these pages are illustrated "grains of a piece of chalk" and "ooze from the Atlantic bed", respectively, with their foraminifera. [Most aptly, one of these figures is reproduced on the front cover of this *Opusculum*].

This interest he retained throughout his schooldays at Harrow (thanks to a schoolmaster named Griffith) and when he left to enter his father's law firm, he was (to use his own words)..."obsessed by two dominant ideas, the beauty and mystery of the Foraminifera, ...and the origin and ancestry of the violin..." (Heron-Allen, 1927). His contribution to the history of the violin and violin-making makes another fascinating story and has already been well documented by Harvey (1995; 2003), but his input in the field of foraminiferal research is generally less well known, except to the specialist. He seems to have maintained an interest in the Foraminifera throughout his rather Bohemian early-life, but only when he was freed from the "daily drudgery" of being a Solicitor did he really find time to study them a little more seriously. There were few who knew much or cared enough to study such small, albeit beautiful, animals in those days, but Edward Heron-Allen was a man who made contacts easily and by enquiry and perseverance joined several learned societies and there made acquaintances which were to be his mainstay throughout his life.

EARLY DAYS

In April 1879 Heron-Allen joined the Quekett Microscopical Club and through its auspices he was able to meet and corresponded with like-minded enthusiasts. Charles Elcock[2] gave him much practical beginner's advice, as can be gleaned from the *Prolegomena towards the Study of Chalk Foraminifera,* Heron-Allen's first formal

scientific publication, dated 1894. Fortescue William Millett[3], however, was probably his most formidable mentor, and after the death of H.B. Brady[4] in January 1891, was undoubtedly Britain's leading foraminiferal authority. Heron-Allen had dedicated the *Prolegomena* to Millett, and in 1892, following a holiday visit in Cornwall, the two appear to have begun a collaboration on the Foraminifera of the Torres Straits, which continued for about a decade. Unfortunately, nothing ever seems to have come of it, possibly because Millett was unconvinced it was worth publishing in the end, little new being found that he had not already described in his extensive study of the Foraminifera of the Malay Archipalago (Millett, 1898-1904). The contact with Millett also opened the way for him to correspond with an experienced foraminiferologist by the name of Arthur Earland. The partnership between "Ned" (Heron-Allen) and "Eugene" (Earland), as they called each other, was to last a quarter of a century and resulted in over 70 published papers. To this most productive relationship British descriptive foraminiferology owes possibly more than any other, but at the same time it would be true to say that the philosophy behind their systematics did not change, nor did they advance it, retaining as they did the classification of the "English School" of W.B. Carpenter and H.B. Brady of the late 19th century - whose trademark was conservatism in the concept of the species.

The story of his scientific career really commences at the time of his first marriage to Marianna Lehmann in 1891. His interest in Natural History allowed him, first, to obtain a Fellowship of the Linnean Society of London

(FZS) on 2nd June 1892, and then, on 16th December of the same year, to apply for election as an ordinary Fellow of the Royal Microscopical Society (FRMS); he was later to become a Council Member and its President.

On the early death of Marianna in 1902 his life changed dramatically. He quickly remarried and with his second wife, Edith Pepler, spent the remainder of his life together, settling in Selsey, West Sussex, at his new house ("Large Acres") which he had built between 1906 and 1907. He, nevertheless, kept on a town house in London (33 Hamilton Terrace) until the mid-1920s and afterwards, a flat in Maida Vale.

Selsey is an interesting place geologically. Buried beneath its sands and the Solent are rocks of Eocene to Pleistocene age. Blocks of *Alveolina*-limestone from The Mixon (or Mixon Rocks), two miles out beneath the Solent, were always being washed ashore and had indeed been quarried for Selsey house-building before the 1860's. These spindle-shaped alveolinas, together with coin-shaped specimens of *Nummulites britannicus* Hantken (better known, incorrectly, as *Nummulites laevigatus*), are the largest foraminifera to occur in England and can be found by any beachcomber along the Selsey shore. [Most foraminifera are one-half to one millimetre in diameter, but these grew to several centimetres across]. It showed geologists that the warm sea of the Eocene period had extended northwards as far as the southern coast of England at that time (about 45 million years ago). Heron-Allen prowled the shore-line picking up these and many other fossils, some of which he sent to the British Museum (Natural History) in London (corals, mammoth bones,

wood, molluscs), as well as examining the beds exposed on the foreshore after scouring storms stripped away the covering sand of the beach.

THE NATURAL HISTORY MUSEUM, LONDON, AND COLLABORATION WITH EARLAND

Fortescue William Millett, whom we have mentioned before, and Heron-Allen had probably originally corresponded through of the Quekett Microscopical Club or met at one of their meetings. It was Millett who had encouraged him, and knowing his mind, suggested he write to a friend, Arthur Earland and introduce himself. These two, Heron-Allen (enthusiastic, charming, but of "strong personality"), and Earland (a rather sober, rational Post Office official), obviously "hit it off" immediately and continued to work together for the next quarter of a Century. The specimens of *Cycloloculina* from Selsey, which had provided the initial study of this long-term collaboration, were presented by Heron-Allen to the British Museum (Natural History) in March 1909; they had published this first joint-paper in 1908. The thanks he received from A. Smith Woodward (the then Keeper of Geology) intimated that if he would like to study the Foraminifera in the collections, full facilities would be accorded. This opened the way in the future to the Museum's hospitality which was to exist up to and beyond his death. His introduction (post-1910) to Joseph Wright[5], the famous Irish foraminiferologist, was also through Arthur Earland.

Heron-Allen's association with the British Museum (Natural History), as it was then known, was always an unpaid and unofficial one, it must be stressed. He was never a member of staff, but was what would be known today as a Scientific Associate. He had various rooms in the Museum from time to time and eventually one room in which his collection and library were finally stored.

In 1910, Heron-Allen, now in his 50th year and having almost entirely severed his connection with the family Law Firm, began to devote almost all his time to foraminiferal studies. The following years were very productive for both himself and for Earland. In February 1911, Heron-Allen was elected Fellow of the Geological Society of London (FGS). The following year, A. Smith Woodward was also prepared to sponsor him for membership of the Palaeontographical Society. Because Heron-Allen had money and the learned societies were always "strapped for cash" his offer to defray the cost of plate production for a publication - and this happened many times - was always accepted. Heron-Allen was indeed a wealthy man and knew that money could buy him equipment and books. He had started to collect books and reprints on the Foraminifera in the 1890's and these now form the basis of what is known as the Heron-Allen Library in the Department of Palaeontology, The Natural History Museum, London. The cost of binding reprints cannot have been proportionally any less then than today, but thanks to his outlay this part of the collection (which he labelled *Variorum de Foraminiferis Opuscula* in gold) remains preserved in its entirety. Overall, his is possibly the finest foraminiferal library in the world, only being

matched by the collection of Joseph Augustine Cushman[6], the famous professional American micropalaeontologist, now in the American National Museum of Natural History, Washington, D.C., USA.

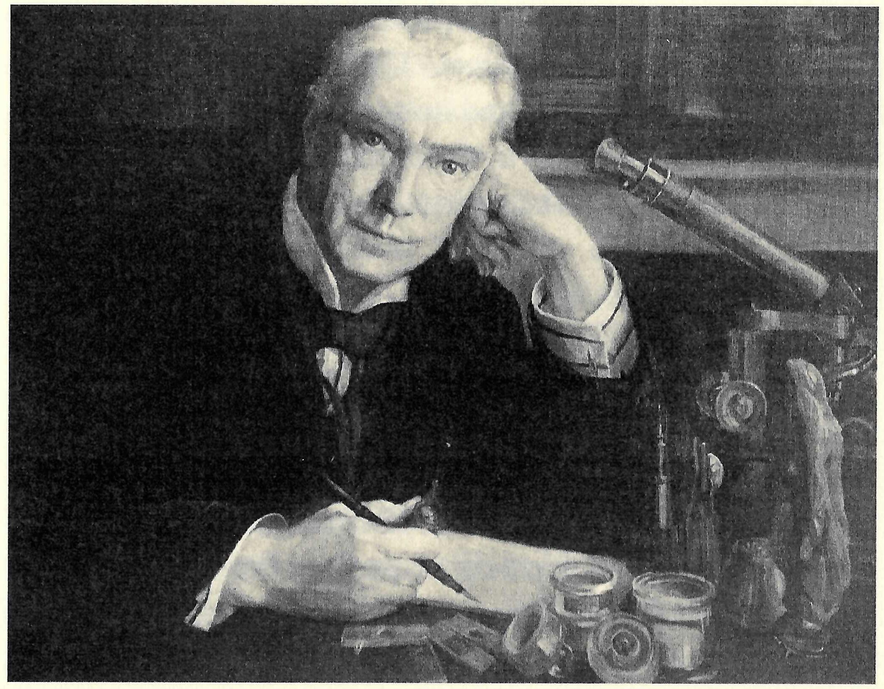
How closely he was associated with Sir John Murray[7] (of *Challenger* Expedition fame) is questionable. It is known that both Heron-Allen and Earland visited him shortly before his tragic death in an automobile accident in March 1914. The collections of marine deposits and other oceanographic treasures from the *Challenger* and other expeditions were housed in Murray's house, the "Villa Medusa", in Edinburgh. Because Sir John had few people to whom he could turn who also knew the value of such a collection, he approached Heron-Allen for his opinion. On the same question he had been approached by Professor McBride of the Imperial College of Science in London. Murray's friend Lawrence Pullar also wrote to him intimating that on the actual day of his death Sir John had been about to amend his Will to contain recommendations concerning the institutions which could and would make the best use of the collections: these being The Natural History Museum, the Science Museum, or the Imperial College of Science, all in London. A good curator was needed, but Earland was too busy at the time. Heron-Allen and Earland ultimately wrote a series of recommendations to Sir Sidney Harmer (Keeper of Zoology at The Natural History Museum), which are recorded in Kempe and Buckley (1987) together with the tortuous negotiations surrounding the final depository of this material.

On the death of Fortescue William Millett in 1915, his nephew and executor, Vivian Millett, invited Heron-Allen

to the house in Brixham, Devon, to remove all scientific material, books and reprints. These are now also in his library. The reprints he had bound alphabetically into the *Variorum de Foraminiferis Opuscula,* volumes 36-70, and labelled "F.W.M." on the spines.

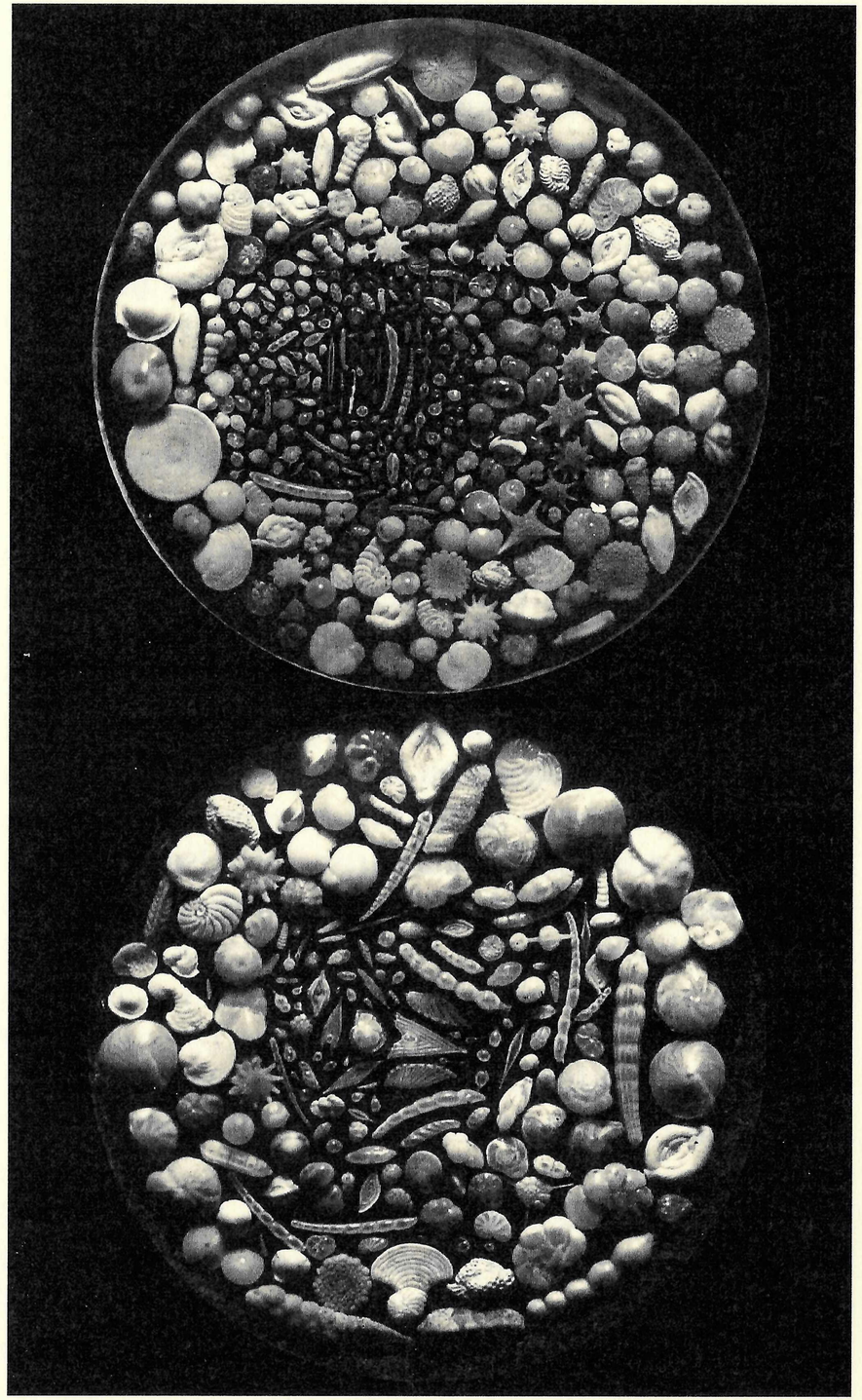
THE GREAT WAR AND A SCIENTIFIC ACCOLADE

During the Great War Heron-Allen became President of the Royal Microscopical Society and took the responsibility upon himself to project the image of that society to the Royal Society at a time when the morale of ageing scientists was at a low ebb and he thought the Royal Society had almost forgotten their existence. He was their Nominated Representative upon the Conjoint Board of Scientific Studies (a body whose labours constituted perhaps the most important work of the Royal Society of London in the Great War), and on the Sub-Committee of the Catalogue of Scientific Literature (he thought the trends were towards a concentration of Societies, as a "rationale" of their existence in the New Order of things). During WW1 he was also an officer in the Sussex Volunteer Regiment and in the war's final stages, editor of a propaganda journal in the Military Intelligence Department of the War Office in London. This latter assignment he obtained through his friend Chalmers Mitchell FRS (who was also engaged in the Intelligence Department, as well as being Secretary of the Zoological Society). During these years, remarkably, he still found



Above: Edward Heron-Allen in his then newly-built library at "Large Acres", Selsey, surrounded by his microscope, samples and foraminiferal slides. From a photograph in The Natural History Museum, London (of an original painting, the whereabouts of which is unknown, by Winifred E.B. Hardman, dated 1922).

Right: Two of Heron-Allen's many exhibition (3"x1") slides which he assembled to show the beauty and infinite variety of the Foraminifera, and sometimes presented to his friends as Christmas presents. Reproduced from original Heron-Allen lantern slides (of a collection of about 700 now in The Natural History Museum, London), which he used for lecturing purposes. Magnified x5.



time to work on his beloved foraminifera, publishing over 20 papers between 1914 and 1918. This "hobby" was clearly..."a solace and distraction from the worries and anxieties caused by the war". "I greatly pity... [he wrote]... the men whose business or pleasures have been seriously interfered with by the war, and having no absorbing occupation to fall back upon, had nothing to do but to think and talk about the prevailing unpleasantness". All of this is chronicled in Heron-Allen's very illuminating War Diary (edited by Harvey and Fitzgerald, 2002).

Heron-Allen was elected Fellow of the Royal Society himself on the 15th May 1919, sponsored by W.A. Herdman[8], E.A. Minchin[9], E. Ray Lankester[10], S.J. Hickson, J.J. Lister[11], P. Chalmers Mitchell, E.B. Poulton, A.E. Shipley, S.F. Harmer, A.S. Woodward, [Lord] Walsingham, H. Woodward and G.W. Lamplugh. Yet in spite of this eminent support, he appears to have had an inferiority complex about the honour, feeling he was not up to their standards as he was more a Curator than Scientist. He was purported in later years to have shown at times a lack of respect for this august body, which made him unpopular with some.

HIS COLLECTIONS AND LIBRARY MOVE TO SOUTH KENSINGTON

In the 1920's, the offer of hospitality by the British Museum (Natural History) was to be tested. He had had some additions done (a 50x25 feet extension) to his Selsey house to accommodate his collection and library. For many

years he had been striving to obtain copies of all the references on the Foraminifera listed by C.D. Sherborn[12], the renowned bibliographer (Sherborn, 1888), and had spent a large sum of money, so that his library was well worth having. Unfortunately, the combination of the strong winds and sea-air of Selsey and the plaster walls of his library were but a breeding ground for damp and blue mould, and fearing that his collection of specimens, books and pamphlets would be damaged, he wrote to the Museum's Trustees twice in 1925 asking if they would store the collection for a year, in the first instance, in South Kensington. In particular, his "Keys to the Foraminifera" could not stay at Selsey any longer..."because of the damp, since they would be ruined in a fortnight". Even today these "Keys", a series of loose-leaf notebooks containing the identifications to his "Type-slide" Collection (see Hodgkinson, 1989), show signs of foxing. To this, they agreed and by June of that year a great many books had already been sent to the Museum, several being very rare (i.e. Lamarck (1801), *Systême des Animaux sans Vertèbres*). Heron-Allen, then realising that the Museum was really the best permanent home for his library and his collections, presented everything in 1926, the collection being accepted on December 10th. It is interesting to note that in a Will, dated as long ago as 19th October 1915, Heron-Allen had left..."the use of all his books, microscopes, apparatus, specimens and materials of every kind connected with the Foraminifera to Arthur Earland for his life and after his death, to The Natural History Museum...", with power to Earland to make them over to the Museum at any time. This is mentioned in a letter to

Harmer, dated 18th May 1922, where he had also announced his intention to re-execute his Will yet again, this time to include cabinets, bookcases and cupboards in his science room. In a subsequent Will, dated 29th June 1922, the wording of his bequest was slightly changed to leave all his...."foraminiferal material and associated equipment to Arthur Earland until his death or until such time as he wished to be rid of it, and only subsuequently to the Museum". The decision to move all this to South Kensington was, however, clearly a good one since he could now easily reach the Museum from his London flat in Maida Vale, but Arthur Earland had difficulty, having either to travel in from Watford (Hertfordshire) or Hastings (Sussex). Nevertheless, this was easier for Earland than having to travel down to Selsey for their collaboration. In 1923 Arthur Earland's own life was also on the "up". His superior had died and he expected promotion to Sub-Controller in the Post Office Savings Bank.

Heron-Allen made arrangement with his bequest, that he was able to remove temporarily such parts of his collection that he might wish to study or needed re-arrangement. In the Museum, he was issued with a "C" key for the joint use of himself and his "assistant", Mr Earland; an honour in itself in those days.

In 1926 the Trustees were asked to house the RRS *Discovery* collections (from the South Atlantic and Antarctica) and provide laboratory accommodation. The specimens would be presented after the reports had been made. Heron-Allen and Earland were to work on the Foraminifera. We know from a letter in 1930 that this had

begun and the former was using carbon tetrachloride (a heavy liquid) to float off and concentrate the (lighter) foraminifera from the sediment. Today, the use of this chemical would not be allowed for Health and Safety reasons!

In spite of the foregoing commentary, the very fine detail of what his bequest actually entailed appears never formally to have been set out in any Will. Clarification only comes in 1931, almost by chance, when at the age of 70, he was in dispute about its accommodation with Tate Regan (the Museum's Director), and he was moved to mention in a detailed, rather forceful and yet amusing letter (dated 4th November 1931) his original terms in offering his collection and library, reinforcing his displeasure by listing at length the extent of his munificence to the Museum. From this and associated correspondence in the Museum's Archive, we can now learn a great deal. He states that it had cost him £6000 to put together his collection and library, but it was currently housed in a "slip" (a very small side-room of a room he had to share with the conchologist, Major W.M.K. Connolly) and in a "hut" at the rear of the Museum, which housed the general Oceanographic collections. The rest was at Selsey, or at Earland's house in Hastings. Details of the collection were listed as follows. He had presented 800 faunal slides, each containing up to 120 species, all catalogued, indexed and card-indexed - which constituted the basis of their published species, lists and descriptions (this is the "Type Slide Collection", see Hodgkinson, 1989). He then itemises the publications (of Heron-Allen, or Heron-Allen and Earland) to which this material refers: Selsey Bill (1908-1911); the North Sea

(1912-1917); Clare Island [western Ireland] (1913); Kerimba Archipelago [East Africa] (1914-1915); South Cornwall (1916); West of Scotland (1916); *Thurammina* (1917); the Biarritz Blue Marl (1919); the *Terra Nova* Expedition [Antarctica] (1922); Nigeria (1922); Corsica (1923); Lord Howe Island [SW Pacific] (1924); Filter Quarry, Moorabool [Australia] (1924); South Atlantic (1929-1930); Plymouth (1930); and the Antarctic (*Discovery* Expedition) (in progress). [For a complete annotated listing of these and other foraminiferal publications of Heron-Allen and Earland, see Hodgkinson and Whittaker, 2003].

In addition, there were 8000 species slides, all card-catalogued and stored in a beautiful mahogany cabinet. The whole comprised an estimated four million specimens plus 2000 mostly cleaned samples. Moreover, he had also accumulated, by purchase and gift, other collections made by Englishmen who were his personal friends (H. Sidebottom, F.W. Millett, J.J. Lister, and J.D. Siddall[13]) and by the noted American, J.A. Cushman. Unfortunately, he lost the right to purchase Joseph Wright's Irish collection (to the National Museum of Ireland) due to temporary lack of funds (£200); neither did the Museum have the money at the time. The collection of his old mentor, Charles Elcock, was offered to him at 21 shillings (a Guinea) a slide, but being a "mass of mildew and destruction", he declined it and it was eventually sold as "rubbish" at Steven's Auction Room. Heron-Allen's library was all catalogued by Author and Subject and consisted of 100 volumes of collected papers (bound in maroon buckram and lettered in gold) under the imprint of

Variorum de Foraminiferis Opuscula, which, at a conservative estimate, contain 2000 reprints. He also presented 700 lantern slides and in excess of 200 books, including the works of Fornasini, Schlumberger, Parker, Jones and Brady, the original drawings of Millett and the former libraries of Millett and Siddall, which he had bought. As a digression, he seems to have been adding valuable books to his library well into to the 1930's, for in the Announcements column of *Nature,* dated 13th April, 1935, p. 579, there is news that..."The original autograph manuscript of Alcide d'Orbigny's celebrated work "Foraminifères" which formed part of Ramon de la Sagra's "*Histoire Physique, Politique et Naturelle de l'Île de Cuba*" (d'Orbigny, 1839), has been acquired for, and added to the Heron-Allen Library of Foraminiferal Research at the British Museum (Natural History)". This book, one of the real "gems" of the library, was probably one of several of d'Orbigny's books that was marked "ARP", meaning that they were to be specially cared for during air raids on London (1939-1945).

Clearly in 1931, he felt he needed better accommodation so that everything could be together at South Kensington. In his letter he had also reminded the Museum authorities that..."I was given to understand that a room would be provided for us (when the vast new building, in which sparse Entomologists wander at large, was completed) in which the Heron-Allen and Earland Collection could be kept together, and where I could transfer the fittings of my laboratory and work-room."..."In this room I hoped to be able to employ an assistant to keep everything up to date, and perhaps to endow an

Assistantship to carry on after my death". What he had got instead was clearly unsatisfactory although he was careful not to blame poor Major Connolly. "[He] is a most amiable and charming colleague, but he is also a Conchologist of world-renown, and he is visited daily by Conchologists from all over the world (a strange proportion of whom seem to be deaf). Conversations, *inter vivos* and by telephone, are of very constant occurrence, and it is very often quite impossible for us to do any combined or serious work in our "slip", especially as my collaborator can only come to London once a week for a few hours. Everyone who wants information about foraminifera comes to us, and the result is frequently a modified Pandemonium of vociferous Zoological discussions". He then ends by threatening to sell everything to the Smithsonian Institution (the American National Museum of Natural History) in Washington, D.C. This deeply offended The Natural History Museum which, in turn, rightly pointed out that this he had no right to do, having already bequeathed it to them in 1926 (27th November 1926, to be precise).

His outburst did have the required affect, however, because after 1932 the Museum gave Heron-Allen and Earland a much larger room, so everything was at last housed together. It necessitated relocating a staff member who was not unhappy with the situation, but it was not to Earland's liking as he felt that his colleague was pulling rank. The Museum, at the time, thought that a further move might eventually have to take place as Heron-Allen was still restless and clearly not an easy man, at times, with whom to deal or to satisfy. Also with the issue of

endowment of an Assistantship being still in the air, it might have swayed some judgements. Nevertheless, for a while everything on the surface appeared cosy. Photographs of famous foraminiferologists adorned the walls of the room (and are still housed in the Department of Palaeontology today) and on the Persian-carpeted floor was his own furniture. Apart from his Westminster Fire Office chairs (he had been a Director and claimed they were made by Hepplewhite; he even retained the repair bills), his slide cabinets, a small (sheet-music) cabinet, and a few memorabilia such as a necklace of alveolines from India which are preserved in the Museum, the whereabouts of the rest is unknown. With his collection safely housed, he continued its curation apace. In 1927 he had also assisted financially in the formation of the Great Barrier Reef Expedition, but the foraminifera of which were not worked up until much later by Collins (1958).

He was a man of generous disposition and still tried to help old friends. Henry Sidebottom[14], at the age of 70, came upon hard times in the 1920's when his provisions for old age were lost in a "Manchester firm's grief". Cushman agreed to purchase Sidebottom's library and it now resides in the National Museum of Natural History (Smithsonian Institution), Washington, D.C. Heron-Allen's reason for non-purchase himself, was that he had all the reprints already, as they were contained within Millett's library which he had bought earlier. Some years before, he had also tried to obtain recognition with the Royal Society for G.O. Sars[15], the great Norwegian naturalist, who was getting very old. W.T. Calman (Keeper of Zoology at the NHM) hoped Heron-Allen would be able, with W.A.

Herdman, to obtain something of a honorary nature, such as a Foreign Member recognition or even a medal for the colossal quantity and quality of Sars' work on marine organisms. However, the Royal Society has no record of their application and we must presume it was unsuccessful. We also learn, through a revelation in Dighton Thomas's 1944 obituary of Heron-Allen, that he was the (anonymous) founder of the E.A. Minchin Fellowship at the Linnean Society (named in honour of his friend).

DECLINING YEARS

At the age of 70, things were working out well on the scientific front, but not so domestically. Since July 1930, when his youngest daughter, Armorel, had tragically been killed in a car accident, his health and handwriting had deteriorated. Arthur Earland thought he looked ill. Financially, things were also under pressure. He had also heavily endowed a scholarship in memory of Armorel at Lady Margaret Hall, Oxford.

About 1933 his partnership with Earland came unstuck. Even in 1928 Heron-Allen had written to Cushman, that Earland, whom Cushman had met, was a rather touchy person who imagined all sorts of sneers - a trait which might have prevented him from becoming finally Controller of the Post Office Savings Bank. In the last few years of their relationship, difficulties with travel and bouts of ill-health prevented the colleagues from meeting at the Museum that often, Earland usually only coming in on a Wednesday. They left each other notes. At

last, when the *Discovery* Reports were in preparation, their long collaboration suddenly ceased. Part 1 was published jointly, but when Part 2 came out (Earland, 1933) it contained (on p. 28) the printed note..."Owing to illness my colleague Edward Heron-Allen was unable to take as large a share as usual in the preparation of the Report. At his own request, and against my wish, his name is omitted from the authorship". This "official line" is at variance, however, with a handwritten note of Heron-Allen's on his own copy (subsequently hidden by several layers of paper pasted over it!)..."I had my name removed from the titles of this paper, when, on my return from Ceylon in 1931 I found that Earland had claimed all my work upon it as his own, and that, not having knowledge of the German language, he had ignored Hans Wiesner's report on the 'Süd-Polar Expedition' [Wiesner, 1931], in which (in my opinion) most of his 'new genera and species' are described and figured". There must be more to this than meets the eye but it is probably best left at that. Apportioning blame now does not help the reputations of either of our only true great foraminiferologists of the early part of the 20th Century.

This period also marked a run-down in Heron-Allen's external commitments, even his membership of the Royal Microscopical Society lapsed. He arranged for the final transfer of the H.B. Brady *Challenger* Collection of foraminifera to the Museum from Cambridge. This was not completed until 1959 by which time he had long since died (see Jones, 1994, p. 14). In those last few years he had managed to arrange the appointment of Cameron D. Ovey[16] as Curator of Foraminifera in the Zoology

Department. To our knowledge the capital to endow an assistantship or "Keepership of Foraminifera", hinted at in 1931, was never made available. Ovey and Heron-Allen worked together, perhaps not too happily, sorting specimens and the last day recorded in Ovey's Museum diary that they met was on the 4th October 1939, before the Second World War closed everything down soon afterwards. The last day that Ovey saw Earland was on the 27th October 1939 and it is unlikely that they, too, ever met again, although they did correspond. The death of Edward Heron-Allen in 1943 followed by the swift demise of his wife must have upset Earland for he had been closely associated with the family for a quarter of a century. Sadly, the contents of his subsequent letter to Ovey were rather condemnatory of the man he had worked with for so long, but his praise for "Nour" (Edith, his wife) is touching.

Luckily, Heron-Allen's collection and library remained undamaged during the bombing of London and C.D. Ovey returned to his duties, finally ceasing to sign the diaries of A.G. Davis (an Associate) in August 1953. Ovey's leaving the Museum thus finally severed the last direct link with the Heron-Allen era.

Edward Heron-Allen died, unfortunately, before any present member of staff had joined the Museum. An obituary, fittingly (but rather sourly) written by Arthur Earland, was published in 1943 in the *Journal of the Royal Microscopical Society,* but by far the best and most comprehensive obituary of him is by R.A. Gregory (1943) for the Royal Society.

AN ASSESSMENT OF HIS SCIENTIFIC CAREER

How was Heron-Allen's "science" regarded at the time by his peers? His election in 1919 to a Fellowship of the Royal Society of London should have answered "very highly", as it is entirely honorary and can be considered the highest scientific accolade in the land. Yet, as we have seen, although he seemed to know the "right people", once he had become a FRS he seemed ill-at-ease amongst his contemporaries, regarding himself more of a Curator than a Scientist. He seems to have made enemies, too, and someone or other in the scientific establishment at the time either did not like him or did not value his research. We do know from his own archive that several of his papers (e.g. Heron-Allen and Earland, 1920, on *Verneuilina polystropha*) got bad reviews.

He obtained fellowships of several other learned societies. These, however, were by (normal routine) election and subsequent annual subscription, and he was only ever President of one - the Royal Microscopical Society - for the two years 1916 and 1917. We also find it strange that he never, as far as we are aware, received a single honorary degree from any university for his scientific work. One gets the distinct feeling that he might not have been taken totally seriously by Academia, being regarded, perhaps, as too much of a dilettante. This seems to be supported by some very telling comments of his own in his War Diary (edited by Harvey and Fitzgerald, 2002). In the entry for 10th September 1917 he is referring (p. 118) to a lecture tour of North America he had undertaken, when a

young man in 1886-1887, where amongst other things he had made a great deal of money out of cheirosophy ("palm reading"). He writes..."I only live in terror that one of these days some F.R.S. who wants to get a candidate elected against me, may unearth these early adventures of mine and preach that I cannot be a serious scientist after such a past".

Recently, a letter has come to light in the Bodleian Library, Oxford[17], which is also quite revealing. It is dated 19th May 1938 and is from Sir P. Chalmers Mitchell FRS to R.T. Gunther, the Oxford zoologist. We quote it in full as it seems to contain an apposite contemporary view of Heron-Allen's scientific career.

> "My dear Gunther,
>
> British science has been much indebted to amateurs, both for actual work accomplished and for generous help financially. I agree that Heron-Allen's work has not been of a very high quality and I personally think very little indeed of some of the general inferences he has drawn. But it has been patient, has extended over very many years, and I am assured has added much to knowledge of the species and distribution of the Foraminifera. His collection of species and types is magnificent.
>
> Apart from his own work Heron-Allen has been a generous patron to institutions and individuals and I know of much generous and useful help he has given.
>
> I know that Ray Lankester thought highly of him and disagreed completely with some of the professional scientific men who were disposed to carp at his election to the Royal Society.
>
> Certainly I should be glad to see him receive some academic recognition.
>
> Yours ever,
>
> P. Chalmers Mitchell".

What we do not know is how much this letter typifies the "professional" opinion. Yet this is the same Chalmers Mitchell who was Secretary of the Zoological Society, worked with Heron-Allen at the War Office, and supported his Royal Society fellowship application. Heron-Allen regarded him as a very close friend, yet Mitchell's valediction is (sadly and a little snobbishly), hardly complimentary. The last paragraph, however, tantalisingly does give a hint that something might have been afoot amongst his peers - in the twilight of his career - to have him receive some academic honour. Why did it never happen?

How is Heron-Allen's foraminiferal work regarded today? Professor J.R. Haynes (University of Wales, Aberystwyth), an eminent foraminiferal authority, has kindly provided us with an independent assessment, as follows.

> "There is no doubt that Heron-Allen made a major contribution to the study of foraminifera in British waters and world-wide with a stream of well-illustrated papers which,

despite his remarks about splitters and "species mongers", described a very large number of new genera and species. For instance, although he passed on Thalmann's remarks about the "Dementia nomenclatorica americana" to *Nature* [Heron-Allen, 1935], he wryly noted that he was himself responsible for seventy-three of the new species in 1934! The problem here is to separate out Earland's contribution. However, the papers do appear to have been written by Heron-Allen.

What also comes out is Heron-Allen's great skill as a collector, particularly his concentration of rarities by his method of "elutration". This skill is particularly evident in his work on Selsey, dismissed as probably not worthwhile by Millett [in Heron-Allen, 1908, p. 530] where he carefully washed the Recent fauna out of weed and off pebbles and distinguished it from the derived, fossil fauna (from which he described *Cycloloculina*). He was clearly a very good, general naturalist.

I see nothing in his main life-work on foraminifera to preclude the award of honours. It is true that he does not appear to be interested in suprageneric classification and this is not even mentioned in his review of Cushman's book [Cushman, 1928] in 1929 [Heron-Allen, 1929]. He is mainly exercised by the revival of forgotten generic names and, with some justice, by Cushman's tendency to

follow the letter rather than the spirit of the Rules of Nomenclature (as in the case of "*Nonion*" which has been a bugbear ever since!).

It is possible that his exploration of "intelligent" behaviour in the foraminifera might have been thought eccentric (not at the time, as shown by the discussion, and the fact that it was in line with Darwin's similar ideas on intelligence in the wasp in the then unpublished "*Big species book*"). It is only after the rise of the Pavlovian behaviourists and their "laboratory experiments" in the twenties and thirties which has helped to maintain the idea of a "great gulf fixed" between us and the animals.

Another favourable point about Heron-Allen's tank studies is that it led him to push forward Lister's work on "*Polystomella*" after the latter's last paper had been turned down by the *Journal of the Linnean Society* [Heron-Allen, 1930].

All in all, I think that any explanation of Heron-Allen's apparent lack of recognition must lie in his "extra-curricular" activities, but that is another story".

FORAMINIFERA NAMED AFTER HERON-ALLEN

The naming of a genus or species after a scientist is, by tradition, a mark of esteem. It is therefore worthy of note that Heron-Allen had a genus (*Heronallenia* Chapman and Parr, 1931) and no less than six species of foraminifera (*Dorothia alleni* Cushman, 1936, *Polymorphina alleni* Cushman and Ozawa, 1930, *Ellipsodimorphina heronalleni* Storm, 1929, *Lagena heronalleni* Earland, 1934, *Oolina heronalleni* Haynes, 1973 and *Saccodendron heronalleni* Rhumbler, 1935) named in his honour.

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More information on Heron-Allen's scientific career, accompanied by a full annotated bibliography of his foraminiferal publications, can be found in Hodgkinson and Whittaker (2003).

NOTES

[1] Heron-Allen nearly always published his works of fiction under various pseudonyms. It was under the name of Christopher Blayre that he also penned a manuscript in 1936 (for private circulation; reprinted Blayre, 2000), outlining in chronological order..."the events and activities of his singularly full and varied life". In this way, Heron-Allen hoped someone might..."write an authentic obituary notice and perhaps, in fullness of time, a memoir of him...".

[2] **Charles Elcock (1834-1910).** Formerly a teacher, he became Curator of the Belfast Municipal Art Galleries and Museum in the 1890's. A stalwart of the Belfast Naturalists' Field Club, he contributed papers on both foraminifera and ostracods to their journal. Had a reputation for helping young scientists, and indeed he seems to have been the earliest mentor of Heron-Allen (initially through the Quekett Microscopical Club).

[3] **Fortescue William Millett (1833-1915).** Retired to Marazion, Cornwall, (and afterwards, Brixham, Devon) where he took up working on the Foraminifera, most notably from the Pliocene St. Erth beds, nearby, and on the Recent foraminifera of the Malay

Archipelago, the latter published in a series of beautifully illustrated papers (1898-1904) in the *Journal of the Royal Microscopical Society.* Heron-Allen paid him a holiday visit in 1892, after initial contact through the Quekett Microscopical Club, and it was to Millett that the young aspiring scientist dedicated his first publication, *Prolegomena towards the Study of the Chalk Foraminifera,* in 1894.

[4] **Henry Bowman Brady (1835-1891).** By profession, a distinguished pharmacist (in Newcastle-upon-Tyne) who served for many years on the Council of the Pharmaceutical Society. Also, a noted authority on the Foraminifera (for which he gained his FRS), his acme being the monumental "Report on the Foraminifera dredged by HMS *Challenger*" (1884). His brother, George Stewardson Brady, also gained international recognition for his work on the Ostracoda.

[5] **Joseph Wright (1834-1923).** Irish naturalist who lived most of his life in Belfast. Most noted for his work on Irish foraminifera, the collections of which are now in the National Museum of Ireland, Dublin.

[6] **Joseph Augustine Cushman (1881-1949).** Founder of what Heron-Allen termed "the American School of Commercial Protozoology", as Director of the Cushman Laboratory for Foraminiferal Research in Sharon, Massachusetts. His vast collections and library now reside in the US National Museum of Natural History, Washington, D.C.

[7] **Sir John Murray (1841-1914).** (Canadian-born) Scottish oceanographer who participated in several important voyages of discovery and was particularly involved with the publication of the Report on the Scientific Results of the Voyage of HMS *Challenger* (1872-1876) and the subsequent curation of the samples.

[8] **Sir William Abbott Herdman (1858-1924).** Zoologist and oceanographer who became Professor of Natural History at the

University of Liverpool. He coordinated scientific investigations and the fisheries industry and indeed owned the steam yacht (SY) *Runa,* whose cruise in the West of Scotland in 1913 led to a noted collaboration with Heron-Allen (and Earland). One of the chief proposers for Heron-Allen's FRS.

[9] **Edward Alfred Minchin (1866-1915).** Protozoologist. Jodrell Professor of Zoology, University College, London and subsequently, Professor of Protozoology and Director of the Lister Institute of Preventive Medicine in the University of London. As well as protists, he also worked on sponges and trypanosomes of the rat-flea. Supported Heron-Allen's candidature for FRS. Died at "Large Acres", being nursed in his last illness there by the Heron-Allen family.

[10] **Sir Edwin Ray Lankester (1847-1929).** Zoologist. Variously Professor of Zoology at University College, London, then at Oxford, finally Director of The Natural History Museum, London, between 1898 and 1907. Shared a common interest with Heron-Allen in protozoology, barnacles and more controversially, rostro-carinate flints (most of which are now known to be artifacts). Strong supporter of Heron-Allen and his ideas, especially his candidature for FRS.

[11] **Joseph Jackson Lister (1857-1927).** A man with a rich scientific background. Commenced the study of foraminifera in the 1890's and contributed an article on them to Lankester's *Treatise on Zoology.* His most important contribution on the group was his painstaking investigation of the life-cycle of *Polystomella crispa* (= *Elphidium crispum* (Linné)), which Heron-Allen published for him after his death in 1930. One of a circle of friends and collaborators who proposed Heron-Allen's candidature for FRS.

[12] **Charles Davies Sherborn (1862-1942).** Eminent bibliographer of Natural History, most noted for his single-handed

compilation of the *Index Animalium 1758-1850,* published in 1933.

[13] **John Davies Siddall (1844-1914).** Another acquaintance of Heron-Allen whom he met through the Royal Microscopical Society. A native of Chester, where he was for many years President of the Chester Society of Natural Sciences, as well as a civic dignitary. Worked on both foraminifera (most notable with H.B. Brady on the *Challenger* Collection) and on diatoms.

[14] **Henry Sidebottom.** A Manchester businessman, of whom little, otherwise, is known. A friend of Heron-Allen (they probably met through the Quekett Microscopical Club or the Royal Microscopical Society). Published some exquisitely illustrated works on the Foraminifera, most notably on the Lagenae of the SW Pacific (1912).

[15] **Georg Ossian Sars (1837-1927).** Notable Norwegian zoologist, son of the equally famous Michael Sars. Professor of Zoology at the University of Christiania (Oslo) for over 40 years, whose main work was on the Crustacea (cladocerans, ostracods and copepods), as well as fisheries biology.

[16] **Cameron Darrell Ovey (1909-1978).** Sometime Curator of Foraminifera at The Natural History Museum, London (c. 1937-1939; 1947-1953), who during WW2 was transferred to the Meteorological Office. Assisted Heron-Allen in his last days at the Museum. Resigned to become a Lecturer in Geography at the University of Oxford.

[17] Bodleian Library, Oxford, MSS Johnson c.19, no. 108. We have to thank Timothy McCann (Assistant County Archivist, West Sussex Record Office) for bringing it to our attention.

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