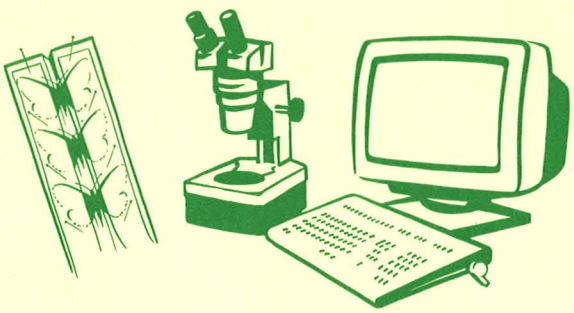
# Journal of Biological Curation



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# Journal of Biological Curation

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The Biology Curators' Group was founded in 1975 with the following terms of reference:

1. To facilitate the exchange of information between individuals concerned with collections of biological specimens and records, their conservation and interpretation.
2. To present the views of biological curators to the Museums Association and other bodies.

BCG holds regular meetings, usually based on topical themes, and occasionally in association with other groups. There are usually two meetings a year, one in the Spring which incorporates the AGM, and one in the Autumn.

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# Physical methods of pest control

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The ideal method of pest control is one which is lethal to all species of pests at all stages of their life cycles but which does not affect the material being treated or the personnel undertaking the treatment in any way.

In the absence of an ideal solution, museums have relied upon a combination of methods including 'poisoning' specimens during preparation, the use of chemical deterrents and the isolation of material in drawers and boxes. The growing concern about the health hazards associated with chemical insecticides and deterrents and the effects of such chemicals on the objects themselves has intensified research into non-chemical methods. This paper reviews the current state of the art of physical methods of pest control.

It is a facet of human nature that we prefer sophisticated high technology solutions to simple, unsophisticated routine solutions. It has to be said, however, that the museum which has established good housekeeping practices will have done much to control insect pests. In this context, good housekeeping means careful inspection of incoming material to detect possible infestation; the isolation of any suspect material pending treatment; procedures to ensure that pests are not introduced into the museum with foodstuffs, display materials and packaging; the design of individual storage units (boxes, trays, cupboards, etc.) to ensure that any infestation is isolated; the frequent inspection of collections in store and on display with the use of traps where appropriate; the elimination of sources of infestation (bird nests etc.) from the building and possible routes of entry (windows, ducting etc.); efficient cleaning; and procedures for the effective treatment (and recording of such treatment) of any infestation which occurs.

The main purpose of this paper is to review current methods of pest control by temperature, relative humidity and by exposure to various kinds of radiation.

## High temperatures

There is no doubt that at sufficiently high temperatures, all insects can be killed at all stages of their life cycles. However, control by heat has little application to pest control in museums because of the damage which the high temperatures cause to the museum objects themselves and to the containers in which they are housed. Having said this, I am aware of one museum which still places complete drawers of insects in an oven at relatively low temperatures, as a method of pest control.

## Low temperatures

Freezing would appear to be one of the most promising methods of pest control available to natural history curators. It has been used for herbarium material at the

Swedish Museum of Natural History, Stockholm (quoted in Crissafulli, 1980) at the Royal Botanic Garden at Kew (Anon, 1980 and Hall, 1981), and at the British Columbia Provincial Museum (Ward, 1976); and for mammal material (Williams, Genoways and Schlitler, 1985). Although some doubt has been expressed at the claim that the treatment can be 100% effective for all pest species at all stages of the life cycle, it would appear that the treatment can be very effective if carried out rigorously. It is recommended that material being treated should be held at -18 degrees Centigrade for a period of 48 hours although Florian (1986) quotes correspondence with Billings at the Slough Laboratory of the Ministry of Agriculture and Fisheries in which he cites experiments which showed that some species of pests were killed effectively in much shorter periods.

Some precautions need to be taken. If large and bulky parcels of herbarium specimens are treated, it may take a long time for the temperature to fall to the required level (in one instance at Kew it took 17 hours). If this is likely to be a problem a thermocouple can be inserted into the middle of the bundle to monitor the temperature. It is probably better to keep bundles small to allow for air circulation within the freezer

There is also evidence to show that some species of insects can acclimatize to low temperatures in certain conditions. The answer would seem to be to ensure that the rate of cooling is rapid enough to prevent this from happening. There is also evidence to show that a slow rate of thawing is most effective.

It is recommended that material is packed in airtight, clear polythene film before treatment. Condensation should not occur inside the bag if it contains absorbent material but silica gel can be used if condensation is likely to occur. After freezing, material should be left inside the polythene wrapping until it has reached room temperature and there is no condensed water on the outside of the bag.

Freezing can affect the germination rates and viability of seeds in herbarium specimens and if this is a factor, advice should be sought from the Royal Botanic Garden. It is unlikely that freezing will adversely affect other types of natural history museum objects unless adhesives have been used.

**Freeze drying**

Although it is likely that freeze drying may be more effective than simply freezing, the difficulty in obtaining freeze drying equipment with a large enough chamber makes its use for this purpose impractical.

**Microwave**

The treatment of pest infested museum specimens with microwaves has been used experimentally with textiles (Reagan, 1982), and with herbarium material (Hall, 1981 and Florian and Kennes, 1981). The technique is based upon the principle that microwave radiation (recommended dose 2 minutes at 2450 MHz/sec) agitates water and fat molecules in the insects, raising the temperature to the extent that they are killed. It should be noted however, that the objects being treated will also be subjected to a significant rise in temperature and that this will be increased if the objects contain fat or water. Reagan concluded that the deleterious effect on textiles made the treatment unsuitable for all but the most robust specimens. Problems have also occurred when using microwave for the treatment of herbarium specimens. Philbrick (1984) noted the devastating effect of microwaves on the viability of some seeds, and Florian (1981)

records that in some cases it weakened adhesives, and in others it caused pine cones to open and shed seeds. Also, unobserved staples or foil could cause burning of associated materials. It was concluded that the method can not be recommended as a standard treatment to disinfest herbarium specimens.

### Gamma radiation

Although widely used commercially, particularly in the food industry, gamma radiation has not been used in museums because of the cost of the equipment and the complex safety precautions necessary. However, Urban and Justa (1986) describe the installation of a gamma radiation unit at the Museum of Central Bohemia in Roztoky in 1980 in which a cobalt source was supplied by the Nuclear Research Institute which happened to be located nearby. The authors state that a dose of 250 to 500 Gy is sufficient to kill wood boring beetles at all stages of their life cycle and that the rays will penetrate to a depth of 1 metre. The radiation chamber measuring 4.5 x 4.5 x 3.6 metres allows large objects to be treated. The authors also claim that no damage is caused to wood, polychrome, oil and tempera paints, surface coatings and glues, straw, textile, leather, parchment or paper.

The possibility of setting up one or two regional centres for gamma radiation appears attractive, but the claims that the objects themselves are not damaged in any way should be treated with some caution. A literature survey reported in *The Abbey Newsletter* on the effects of gamma radiation indicates that there is a weakening of the physical strength in some materials and there is clearly a need for further research.

Butterfield (1987) showed that gamma radiation caused a decrease in the mechanical strength of some papers. A pilot project into the effectiveness of gamma radiation to control mould and insect infestations (reported in *The Abbey Newsletter* April, 1984), carried out at the Alan Mason Chesney Medical Archives at John Hopkins Medical Institution in Baltimore, USA, found that a treatment of 0,45 Megrads for 45 minutes was effective for mould and insect pests (no details of species). The estimated cost was $1.00 per cubic foot.

### Summing up

At the present time, the most effective and practical treatment for insect pest control in natural history collections would seem to be freezing. However, developments with gamma radiation need to be followed and more research is needed.

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# Guernsey Museum and Art Gallery: Natural History Collections

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## Abstract

This is the first time that details of the natural history collections at Guernsey Museum and Art Gallery have been published outside the island. The development of the three nineteenth century collections which came to be included in the present museum is considered in some detail. This is followed by general information on the main individual collectors and collections involved although this very much represents the present state of curatorial research.

### Author's note

This seems to be the first time that details of the natural history collections in Guernsey have been published outside the island. It is proposed that this text will form a general introduction to the somewhat complex history of the collections currently housed at Guernsey Museum and Art Gallery. More detailed subject based accounts will follow in due course. The opening remarks are included for the benefit of those who are unfamiliar with Guernsey and its situation.

## Guernsey in context

The island of Guernsey has a population of 56,000 people living in an area of around 64 sq km (24 sq miles). It lies 110 km from the closest point on the English coast and only 46 km from France. It is the largest of the northern group of the Channel Islands, (including Alderney, Sark, Herm and Jethou) which constitutes the Bailiwick of Guernsey. Jersey gives its name to the more southerly Bailiwick.

Though some of the southern islands of the archipelago are French possessions, the two Bailiwicks which include the majority of the Channel Islands remain British. Originally they formed part of the Norman-British area of northern France. The Bailiwicks are not part of the United Kingdom though they owe allegiance to the British Crown, the monarch being traditionally regarded as Duke of Normandy.

Guernsey and Jersey have their own separate elected governmental bodies, known as 'States of Deliberation' - usually referred to as 'The States' in common parlance; a history of Guernsey's States of Deliberation has been published recently (Hocart, 1988). There is no party political system and the sitting States members (called deputies in Guernsey) are simply elected as peoples' representatives by the various island parishes. The functions of the islands' administration are supervised by committees of States members; Guernsey Museum and Art Gallery being controlled by the States of Guernsey Ancient Monuments Committee and staffed by Guernsey Civil Servants.

# Natural history in Guernsey's museums : a developmental summary

The public administration of Guernsey did not become involved with museums until 1907, but there were three institutions with natural history collections on the island before that date. These were:

**(i) Guernsey Mechanics Institution and Literary Society**

**(ii) The Guille-Allès Library and Museum**

**(iii) The Lukis Family Museum**

Though these collections all eventually came under the care of a States run museum service, of the three, only the Lukis Museum collection is actually owned by the States of Guernsey. It was bequeathed to the States in 1907, followed by another substantial bequest (of non-natural history material) from William Carey in 1929. However, it was not until 1973 that the States appointed their first full-time and professionally qualified curator and the development of the present Guernsey Museum and Art Gallery service began. The Guille-Allès collection (which included the Mechanics Institution material) was transferred on permanent loan to the Museum and Art Gallery service in 1978. The first full-time natural history curatorial appointment was made in 1986, for an initial two year period and this has now (1988) been extended for a further five years. As may be imagined, there is a considerable backlog of curatorial and documentation work associated with these collections.

The natural history holdings of Guernsey Museum and Art Gallery are estimated at around 35,000 specimens with insects accounting for 20,000 of this number. Geological material accounts for a further 6,000 specimens with the remainder being spread over most of the traditional areas of natural history collecting. It is worth noting that the majority of non-insect collections were originally on display, so the birds, for instance, are all mounted specimens rather than study skins. A narrative describing the development of these substantial collections is not entirely straightforward as they largely existed in parallel although their periods of growth were slightly different. It is proposed to describe them in the order given above.

### Guernsey Mechanics Institution and Literary Society

Little detail survives relating to the collections, but the Mechanics Institution itself was founded in 1831. The first president was Frederick Corbin Lukis, whose personal collecting activities will be considered later, though his apparent enthusiasm for collecting may not be without significance in relation to the Institution.

A printed letter appealing for funds to establish a museum was circulated by the Institution's committee on 5th December 1855. It mentioned an 'interesting collection of rocks and objects of natural history' presented by the 'Honourable court of Directors of the East India Company' and the desirability of adding this collection to the 'articles already in their possession ... to form a nucleus for a museum' (MacCulloch et al, 1855). It seems that a museum did develop but by 1862 the regular lectures of the institution had been in abeyance for several years, 'and the museum had been left to the voluntary assistance of a few working naturalists, without much reference to the Institution' (Ansted and Latham, 1862a). The same source described the museum as 'remarkably good in all respects as a local collection ..... particularly rich in natural history, containing a series

of birds, insects, and shells all in good condition, well arranged and well named'. Further the authors expressed regret at the recent failure of an attempt to guarantee the survival of the museum by States involvement - presumably an attempt to secure official funding for the museum.

Early in 1863 a circular written by the poet Martin F. Tupper with the stated suport of his cousin the Bailiff (Leader of the States) Edgar MacCulloch, sought to call a meeting in order to discuss the future of the museum (Tupper, 1863). It proposed an expansion of the one already in existence to form 'a large popular museum and school for design which shall be self supporting'. The letter went on to mention various promises of exhibits, collections and funds. These offers all depended on the successful raising of capital to support the erection of a building and the devising of a scheme to render the institution self-supporting. In modern terms it would appear that the supporters of the museum tried to raise funds from the private sector, after their earlier approach to the island authorities had met with no success. Despite the support of such an influential person as the Bailiff, this scheme also came to nothing.

Though the Mechanics Institution remained moribund, concern for the collections continued and, in 1874, trustees were appointed 'to take charge of the objects forming the museum ... with power to transfer them to any person or persons who would engage to make them available for the benefit of the public'. At the same time, the museum was effectively disconnected from the Institution itself. These events, at the Annual General Meeting of the Mechanics Institution in April 1874 were duly noted in a *Minute Book for the Trustees of the Guernsey Museum.* This survives in the Guille Allès Library local studies collection and gives details of several meetings which the trustees (who included Edgar MacCulloch and John Whitehead) held between 1874 and 1881. By November 1874 they had resolved to let a Miss C. B. Carey 'clean the foreign birds and to allow the public to have admission to the room on Saturdays, on such terms as may from time to time be decided upon'.

In 1876 public suggestions were still being made that the States should initiate the deleopment of a public museum and lecture hall (Anon, 1876). At about this time there were also suggestions that the proceeds of the Admiral De Sausmarex memorial fund should be used for a similar purpose. These schemes came to nothing but, in 1882 the trustees of the Mechanics Institution collections were able to forge an agreement which met the requirements of their trust. Thomas Guille and Frederick Allès agreed to accept the collections of the Mechanics Institution and make them available to the public in rooms at their new library. In fact the collections were not physically transferred until 1884-85. Along with Messrs Guille and Allès, John Whitehead continued as a trustee of the collection, and supervised the setting up of the new Museum. Like the Trustees' minute book, the documents relating to the transfer refer to the Mechanics Institution collection as 'Guernsey Museum'.

**The Guille-Allès Museum**

Although it was not actually in public ownership, the Guille-Allès Museum was the first institution of its kind in Guernsey to be founded as such. It was an adjunct to the Guille-Allès Library and occupied rooms on the upper floors of that building in the centre of St Peter Port. The institution was founded by two remarkably philanthropic Guernseymen who made their fortune in the United States.

Thomas Guille and Frederick Mansell Allès were originally apprenticed into the housepainting and decorating business of a Mr David Mauger (another Guernseyman) in New York. Eventually Guille and Allès became partners in the firm and carried it on to make a considerable fortune after Mauger retired.

In 1834, shortly after Guille's arrival in America the books which he had found in Mauger's house and the extensive library of the General Society of Mechanics and Tradesmen, greatly inspired the young apprentice. He resolved, apparently on his first visit to this library, to found such an institution in Guernsey (Pitts, 1883). Allès arrived in New York in this same year and the two childhood friends became united with the same ideal. They began to acquire books for the projected library and also studied 'chemistry and practical science' together (Warren, 1959). They were also collecting geological specimens, but whether by purchase, gift, or field collection is not clear.

Though this is not the place for a detailed history of the development of their library, a brief outline is not inappropriate. As early as 1851, Guille made overtures towards presenting his books on Guernsey. A Guille Library was established by 1856, with five locations around the island, retracting into a single central premises in 1867. Around 1869, Guille retired from business and returned to Guernsey, continuing to promote his library, in which enterprise he was eventually joined by Allès. Their efforts culminated in the opening of the Guille-Allès Library on 2nd January 1882 (Rowswell, undated).

From the outset, it appears that the founders of the new institution intended it as far more than just a library. It was to be a cultural, educational and recreational centre for the island and, indeed, it did herald something of a renaissance. The addition of the museum to the library was followed by an Artisans Institute where educational lectures could be heard. Various clubs and societies were also encouraged to use the rooms as a meeting place and, pre-eminent among these (as far as the museum was concerned) was a group known as the Guernsey Society of Natural Science (G.S.N.S.). The published transactions of this society (which became known as La Société Guernesiaise in 1926) contain many references to the development of the Guille-Allès Museum. These fill a useful void as the early administrative records of the library do not seem to have survived.

The inaugural meeting of the new society was held at the Guille-Allès library on 24th October 1882, following on from a public meeting held on 10th October, 'for the purpose of forming a Natural History Society.' Principal aims of the society included the provision of mutual aid in the study of natural history, 'by means of papers, conversations, exhibitions of specimens and excursions.' The compilation of current lists of the 'natural productions of the Bailiwick of Guernsey' was also a stated aim, together with their publication in the proceedings of the society (Anon, 1889). Significantly, perhaps, no mention was made of the society building up collections, although it was preferred that 'natural productions' for inclusion in the Society's listings should be supported by specimens where possible. In practice some specimens were given to the society in their first year or so, presumably because the new museum was not yet arranged in the rooms above the library. A resolution to acquire a cabinet to hold their botanical and other specimens was passed on 6th March 1883 and, in the case of botany, established a considerable precedent. La Société Guernesiaise still maintains the island's main herbarium of local plants and the membership of the Botany Section has consistently been one of their most active.

Returning to 1883 and the Society's part in the growth of the new museum, at the first annual meeting one of the committee reported: '... such donations of specimens seem

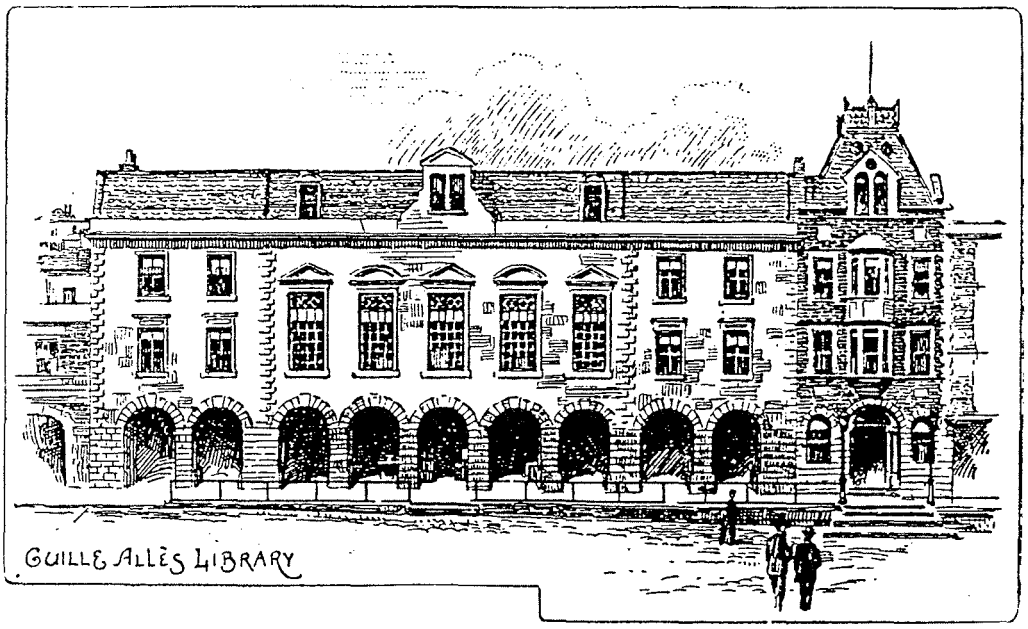


Fig 1. Guille-Allès Library, St Peter Port. The illustration was produced for a history of the Institution published in 1891.

to point to the necessity of room for their reception, and would, if encourag undoubtedly increase into an island museum, but without much larger funds it would l impossible for this society to undertake the formation of this, so much needed and usefu an institution' (Derrick, 1889). The 1884 annual meeting again saw reports of the presentation of some rock specimens and comments on the desirability of a suitable museum for their reception.

By 1885 the reality of a museum was much closer, Messrs Guille and Allès having provided rooms which Society members were urged to fill with specimens. On 24th November 1885, Thomas Guille in his role as President of the Guernsey Societey of Natural History, said, '... the Natural History collection of the late Mechanics Institution is now being transferred to the upper storey of this building, where it is intended to be placed permanently with my own and Mr Allès' private geological and mineralogical collections, as nucleii of what we hope will later better deserve the name museum' (Guille, 1889). The condition of the Mechanics Institution specimens seems to have been very poor, due to indifferent storage or display conditions and general neglect. Guille commented that everything which was not, 'completely ruined', required 'careful cleaning' which would take some time. Earlier in his address he had been particularly scathing about Guernsey's general complacency and the lack of States' funding which had allowed an 'extensive and valuable' collection to reach such a condition.

By the seventh general meeting of the society, in 1889, the secretary was able to report that the museum was 'daily growing more valuable.' The decades around the turn of the century saw remarkable growth in the collections for the Guille-Allès Museum. Members of the Guernsey Society for Natural Science were intimately involved with this growth and there were clearly common and complimentary aims for the society and the museum. Although the museum was always under the control of the Board of Trustees of the

Guille-Allès Library, through their General Manager, the succession of Honorary Curators who looked after the museum were usually also active members of the Society.

Turning to the museum itself, state-of-the-art customised accession registers were bought in 1901 but, for some reason, they were never used. The only effective specimen documentation consisted of display labels and whatever labels might be stuck to the specimens. Virtually everything was on display and photographs of the interior show it to have been the archetypal 'Victorian Museum' which modern curators either dream or have nightmares about - depending on their point of view.

By all accounts few would dispute that by the 1970's the displays were very tired looking. A combination of poor environmental controls (rooms with unfiltered top lighting through sky-lights which occasionally leaked and cases which were not dust-tight), had inevitably caused considerable deterioration. The absence of full-time professional staff and the meagre budget available to the Honorary Curators also contributed to this gradual decline. It might ultimately have resulted in the loss of the entire collection, but thankfully the decline was halted. In 1978 the Trustees of the Guille-Allès Library placed these historically important collections on permanent loan into the care of the Guernsey Museum and Art Gallery Service.

**The Lukis Museum**

The collection on which the States' run museum service would ultimately be founded, saw its genesis long before the Guille-Allès Museum. Described in 1862 as a 'valuable and interesting private museum', the collection begun by Frederick Corbin Lukis and added to by his children was kept at Lukis House, the family residence in St Peter Port. Though essentially a private museum, all visitors with a genuine interest in science or natural history were made welcome (Ansted and Latham, 1862a). A visitors book covering the years 1876 - 1907 survives in the Lukis archive at Guernsey Museum and Art Gallery. It contains comments and visitors cards from people as diverse as the Russian Prince, Mestchersky, the wife of W. Holman Hunt and Professor J. Prestwich, together with many lesser mortals.

Frederick Corbin Lukis was primarily an enthusiastic amateur archaeologist. He pioneered the application of a systematic approach to excavation and recording in the islands. His four sons and three daughters assisted in these pursuits and, as a result, a remarkable archaeological collection with corresponding notes and drawings accumulated at the family home. This would have been noteworthy enough, but Frederick Corbin's interests extended into the natural sciences, and the family also developed collections of local and foreign geology, insects, plants and shells.

It is inferred in the circular written by Tupper mentioned earlier (Tupper, 1863), that the Lukis collection (or part of it) was among the material on offer to the projected new museum in 1863. However, with the failure of the latter venture, the collections remained in the possession of the family until 1907. Then they were bequeathed to the States of Guernsey by Francis Du Bois Lukis, in accordance with the wishes of his father. Prior to this, it seems that the museum may have been opened to the public from 1900, at least on a limited basis. On the bequest of the collections in 1907, the family sold Lukis House to the States for a nominal sum, in the hope that the museum would be maintained there. Some refurbishment was carried out and the new States-run Lukis Museum was formally opened on 18th September 1909. In the event, the museum only remained in Lukis House until around 1937 when the building, already partly used as offices, was completely given over to this purpose.

Fig 2. Lukis House, the former residence of the Lukis family in St Peter Port. Part of it opened as the Lukis Museum in 1909, though it closed around 1937.

**The Lukis and Island Museum**

Ostensibly as a rationalisation exercise, it was decided to combine the Lukis Collection with the Carey Collection (mentioned earlier, bequeathed to the States in 1929) to form one States-run island Museum. The two collections were moved to the redundant and deconsecreted church of St Barnabas - a very dominant feature of the St Peter Port skyline. This was opened to the public as the Lukis and Island Museum in June 1938. During the German occupation it was closed (as was the Guille-Allès Museum), only re-opening in 1946. It remained open until 1970 when structural deterioration of the roof forced its closure to the public.

The museum never had full time professional staff, being run on a shoestring budget by an honorary curator and a custodian/attendant. In retrospect, it seems to have been a half-hearted attempt at setting up a museum. However, gradually, the deficiencies came to be recognised and the political will to provide a proper museum service became established.

**The Guernsey Museum and Art Gallery**

In January 1974 Guernsey appointed its first full-time and professionally qualified museum curator to oversee the development of a projected new museum which would finally do justice to the excellent collections owned by the island. The purpose built

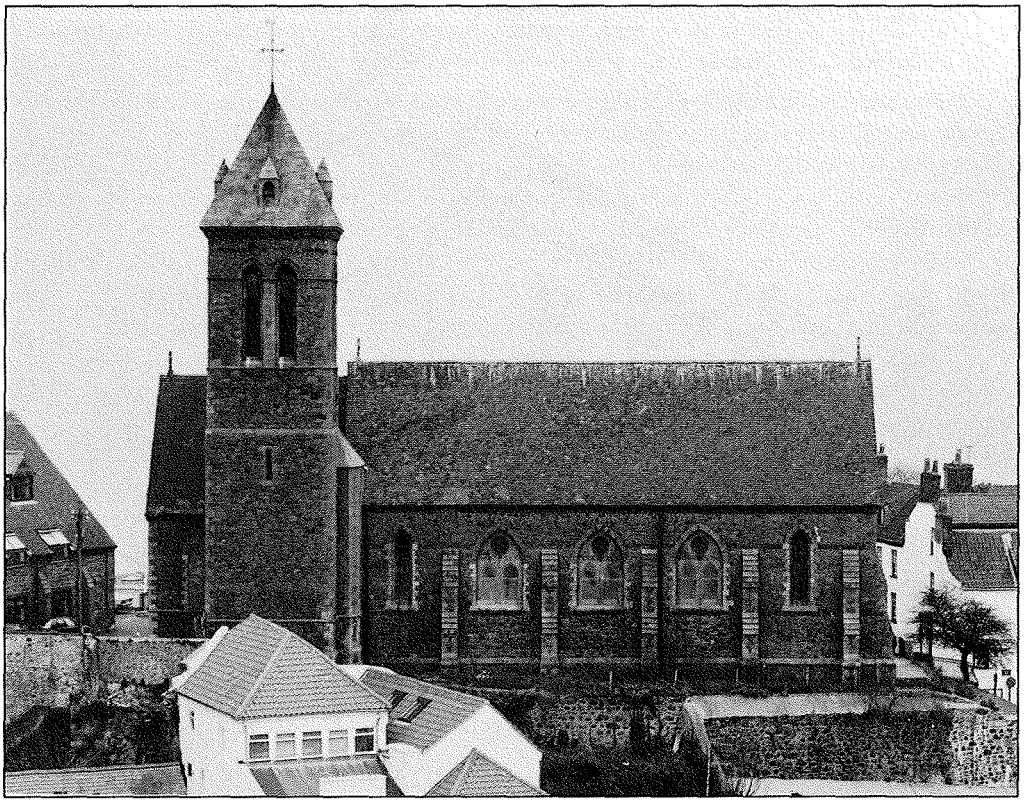

Fig 3. St Barnabas Church, St Peter Port. From 1938 until 1970 it housed the Lukis and Island Museum.

Museum and Art Gallery in Candie Gardens was opened in 1978 consisting essentially of display and adminstrative facilities (Cole and Reed, 1978). The initial high standard which attracted a Museum of the Year award in 1978 has undoubtedly been instrumental in assuring the relatively rapid growth of the museum service. The staff of three in 1974 has now grown to ten in the professional, technical and secretarial roles.

Economies of scale precluded the incorporation of storage and workshop areas in the new Museum at Candie but the need remained to remove the main reserve collections from the old Lukis and Island Museum building. Fortunately an excellent alternative became available, only five minutes walk from Candie, in the shape of the redundant St John Street telephone exchange. This now houses the main storage and technical facilities of the museum service, the Lukis and Island collection having been transferred there in 1978. Following the agreement with the trustees of the Guille-Allès Library, the extensive collections of the Guille-Allès Museum were moved to St John Street in September 1979.

## Collections and collectors

It will be apparent from the foregoing that the natural science collections at Guernsey Museum and Art Gallery essentially derive from two sources:

**(i) The Lukis family collections;**

**(ii) The Guille-Allès Museum which includes the Mechanics Institution collection.**

There have also been a few additions since the incepetion of a professionally run museum service in 1974.

### Lukis collection

Bequeathed to the States of Guernsey in 1907 by Francis Du Bois Lukis, youngest son of the collection's originator Frederick Corbin Lukis. As noted earlier, Frederick Corbin's children also added material both during their father's life and after his death; it is generally difficult to differentiate between material collected by the various family members.

#### *Frederick Corbin Lukis FSA (1788-1871)*

The Lukis family came to Guernsey in the mid seventeenth century. By the time of Frederick Corbin the family had prospered considerably, his father John having made substantial sums from shares in privateering and the wine trade. Frederick Corbin was a colonel in the Royal Guernsey Militia, Aide de Camp to the Governor and a busy public servant. As we have seen, he was involved with the Mechanics Institution, clearly espousing popular education and self-development. The manuscript notes of some geological lectures he delivered to the Institution are present among the Lukis papers in the museum. Primarily known for his archaeological work, he was also an authority on the natural history of the islands and contributed a list of some 140 lichens to one book on the island flora (Babington, 1839). Frederick Corbin Lukis was also known as a shell collector, particularly being cited by J. G. Jeffreys as the authority regarding the discovery of living *Triton* specimens in Guernsey waters in 1825 (Jeffreys, 1858). He was also quoted by Yarrell (1836) in relation to the behaviour of seahorses.

#### *Frederick Collings Lukis MD, FSA (1814-1901)*

Problematically having the same initials as his father. Frederick Collings was noted as having (in addition to archaeology) botany, entomology, geology and conchology among his interests and for having left a fine shell collection.

In relation to conchology, Jeffreys (1863) praised him as a true naturalist rather than a mere collector and often cited distribution records from him. At least some of his collection is probably among the shell material, formerly at the old Lukis and Island Museum which is still awaiting curatorial attention. The documentation with this material appears to be minimal. Recently (1988) a rather better ordered Lukis shell collection has been passed to the museum by Eric Lukis, a great grandson of Frederick Corbin. This is the same cabinet described to the Conchological Society in an address concerning the aforementioned Guernsey *Triton* specimens (Crowley, 1960).

Among the material from the Guille-Allès Museum there are several insect storeboxes, labelled as from the 'Dr Lukis Collection'. Most of them are empty, though two are crammed with specimens (mostly coleoptera) in rather poor condition. The style of mounting is interesting, some specimens being glued to card discs mounted mushroom-like on top of thick pins with a blob of sealing wax. Cryptic data is present on some

specimens and the writer would appreciate help with tracing any entomological contributions penned by Dr F. C. Lukis MD.

***John Walter Lukis (1816-1894)***

The second son of Frederick Corbin Lukis, John Walter was a mining engineer by profession. In the course of this he seems to have amassed a substantial collection of minerals though these are only separable from the main body of the Lukis Geological collection (see below) by distinctive stuck-on labels. He had developed the family passion for archaeology which clearly impressed the Cardiff Naturalists Society when he moved there in 1872, for he became their President in 1875 (Anon, 1895-96). He remained in this office until 1877 when he moved to Morlais in Brittany. After his wife died in 1893 he returned to Guernsey but died the following year, 1894.

***Rev William Collings Lukis MA, FSA, FRSNA (1816-1894)***

He was at Trinity, Cambridge and attended lectures on archaeology and natural science. He was a founder member of the Wiltshire Archaeology and Natural History Society, and made various archaeological contributions and the British Museum purchased artefacts and pottery from his estate, after his death at Wath, Yorkshire. He had been rector at Wath for 31 years. Natural history collections by W. C. Lukis are not known but in the Lukis archive there are some manuscript notes for geological lectures (delivered in Ripon) which may be in his handwriting.

***Captain Francis Du Bois Lukis (1826-1907)***

He retired from the army in 1870 and carried out some archaeological excavations in Alderney. In keeping with the wishes of his father he bequeathed the family collections to the States of Guernsey.

The largest and most important part of the Lukis collection is undoubtedly the archaeological material. However, the natural history material also has many merits. Apart form the shells and the insects mentioned above, the principal Lukis natural history material is the **geological collection.** It is considered here separately as it clearly contains material gathered by several members of the Lukis family. The collection includes around 3000 specimens, some of which relate to a *Catalogue of Minerals Belonging to Frederick C. Lukis,* held in the Lukis Archive. This has 901 entries and is undated though the water marks in the paper are from 1801. It is assumed to refer to Frederick Corbin Lukis and the collection is especially valuable for the local specimens which make up about half of the total. Some of the catalogue entries include details of who supplied the specimens to Lukis. Many are local names, but a couple of specimens came from **Dr Buckland** (with whom Lukis had corresponded about a cave deposit at Corbierre, Guernsey) and several dozen Scottish specimens originate from **Dr John MacCulloch** MD, FRS, FLS, FGS (1778-1835), described as 'a distinguished Guernseyman and eminent geologist' (Marr, 1984). In the second decade of the nineteenth century MacCulloch conducted a survey of Scotland for the Board of Ordnance, with the object of determining the best types of rock for safe employment in powder mills. In 1811 he contributed the first paper in the Transactions of the new Geological Society of London (an account of Guernsey and the other Channel Islands). Between 1826 and 1832 he worked on a commission to produce a geological map of Scotland. Although he was educated in England and studied Medicine in Edinburgh, it would appear that MacCulloch always retained some links with the place of his birth.

At the time of the transfer of the Lukis Collection to the Lukis and Island Museum, that well known Channel Island geologist, Dr A. E. Mourant, worked on the geological collection and was responsible for arranging the geological exhibits (Mourant, 1984).

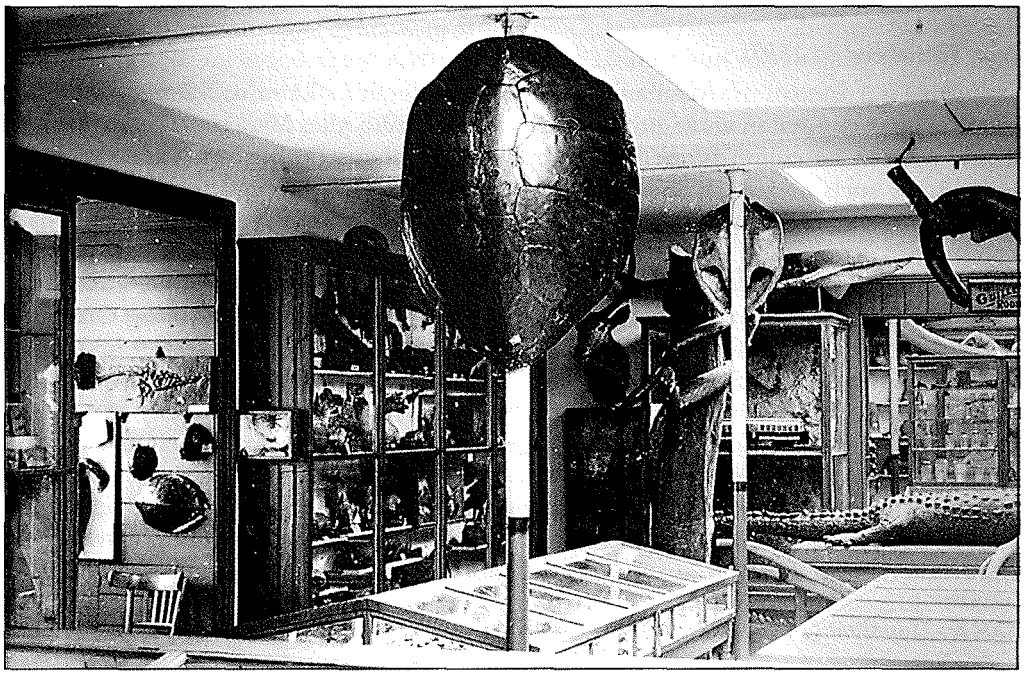

Fig 4. Guille-Allès Museum; a general view of the Guille Room, taken about 1975.

**Guille-Allès Museum collections**

*Guernsey Mechanics Institution and Literary Society*

As related earlier, this collection was absorbed into the Guille-Allès Museum when the latter was founded. It is convenient to regard it as a single entity as little related documentation survives. However, tantalising evidence has begun to emerge, including several pages of accounts mainly relating to the acquisition of bird specimens and a single page torn from a manuscript accession register for 1839-40. This lists among other things the tusk and bones of a Siberian mammoth presented by Mr B. Maingy (a frequent donor of minerals to F. C. Lukis). These specimens are still present among the material from the Guille-Allès Museum. Other less distinctive entries like 'numerous Swiss lichens', and sundry collections of unspecified minerals and shells will probably never be recognised among the mass of uncatalogued Guille-Allès specimens.

*Thomas Guille (1817-1896)*

North American geological material, collected mid-nineteenth century. The size of collection is not known, but a substantial number of Pennsylvanian fossil plants and other specimens bear a small letter 'G' in red paint which may indicate their original ownership. See earlier historical notes for more details of Guille and Allès.

***Frederick Mansell Allès (1818-1895)***

North American geological material collected at the same time as that of Thomas Guille. Details of the size and content of the collection is also scanty, but handwriting on the labels of North-American specimens may ultimately prove helpful.

***John Whitehead (d.1897)***

Earlier, a trustee of the Mechanics Institution collection. Later, as the first honorary curator, instrumental in arranging the embryonic Guille-Allès Museum. Particularly, it would appear, he commissioned the supply of specimens (at his own expense) from individuals such as Joseph Sinel, the Jersey-based marine biologist and preparator. Marine invertebrates (especially crustacea) and mammals were among his donations.

***William Ambridge Luff (1851-1910)***

Luff was the moving spirit behind the entomological work of the young Guernsey Society for Natural Science. This resulted in several published lists of insects found in the various islands, with periodic updates and revisions. Luff collected copiously and his extensive collections were acquired by purchase in 1913, though no manuscript notes or catalogues accompany the material. Largely, the more important specimens can be linked with some certainty, to the data in the published lists in the G.S.N.S. Transactions. However, there is a large amount of duplicate and unsorted material, originally left by Luff in collecting boxes labelled as to locality and date of capture. These have, to an uncertain degree, suffered various rationalisation and sorting attempts over the years.

***Gilbert Hamilton (1803-1882)***

A collection of minerals was presented to Charlotte Brabazon Hamilton (née de Sausmarez, a prominent Guernsey family) in 1889. It had belonged to her husband, Gilbert, who was a managing partner in the Soho Works founded by James Watt and was, in fact, related to Watt by marriage. The collection of minerals was reported to be in several cabinets at the time of donation (Guille, 1890). This statement was either erroneous or what appears to be the collection has since been removed into a single cabinet which originally had 24 drawers. The specimens are small but generally of a high quality, though mechanically and environmentally caused damage has occurred. There are about 400 specimens. Data is minimal, though about half the specimens are numbered and presumably some kind of list or catalogue once existed. The reference given above implies that the collection was started by James Watt the engineer and given to Hamilton by Watt's son.

***Dr Frederick Collings Lukis MD***

See entry under Lukis Collection.

***Louisa Elizabeth Collings née Lukis (1818-1887)***

Louisa was Frederick Corbin's eldest daughter and developed a keen interest in lichens, probably from her father. In 1847 she married the Rev W. T. Collings, Seigneur of Sark and, as Mrs Collings, contributed a list of some 185 Guernsey lichens to one book describing the islands (Ansted and Latham, 1826b). Her collection was given to the Guille-Allès Museum after her death and includes much material from the well known lichenologist Charles Larbalestier (who was a family friend) and the Rev Churchill Babington. Martin Tupper, the poet mentioned earlier, refers to her

rather quaintly as the Queen of Sark, in a letter to her father (Tupper, 1866b). Another letter notes that she had a shell collection (Tupper, 1866a), the fate of which is unknown.

***Lilian Lyle (1890-1936)***

A series of marine algae specimens from the Channel Islands, collected early in this century. These included dried and mounted specimens and microscope slides. Lists were published in the G.S.N.S. Transactions. Also donated material to the British Museum (Natural History) and the National Museum of Wales (Kent and Allen, 1984).

***J. W. Sinel and J. Sinel***

Father and son, marine biologists and preparators of Jersey, supplied numerous models (especially fish casts), taxidermy services and set-piece museum displays, over a considerable period of time. Also provided 'peripatetic technical services' to the museum during an annual summer-time visit, when cases were fumigated, exhibits renovated etc. This annual custom was taken over from 1926, until shortly before his death in 1955 (except for the war years), by a Mr S. G. Finch of London.

***J. W. Belle***

Guernsey and Alderney Odonata, three storeboxes collected 1978. Also re-determined Odonata in existing collections, for a published study of local dragonflies (Belle, 1980).

***E. D. Marquand (1848-1918)***

Twelve drawer cabinet and twenty storeboxes of mixed Guernsey and English insects. The latter were collected principally in the Penzance, New Forest and London areas where the Marquand family had lived. The collection may have been in the possession of W. A. Luff (q v) at the time of his death, as no record of its separate transfer to the museum can be traced and its separate identity has only been established by handwriting comparisons.

***Mr Harman***

Twelve storeboxes of European lepidoptera, mostly from Switzerland and Guernsey, presented 1970-71. About half of this collection, which was originally of very high quality, with full data, has been reduced to dust by the activities of dermestid beetles. The data from the lost specimens does, however, survive and may prove useful. No biographical details of the collector have so far been traced.

**Guernsey Museum and Art Gallery, recent additions**

***C. J. Shayer (d.1981)***

Eleven drawer cabinet of local lepidoptera presented to Guernsey Museum and Art Gallery by his widow in 1982.

Cyril Shayer was the secretary of the entomological section of La Société Guernesiaise, from 1942 until the time of his death.

In 1982 the museum was offered on long loan two large (420mm x 335mm) volumes of natural history paintings, presumed to have been executed by various members of the Lukis family. They vary considerably in quality and style,Inscriptions in each volume record that they were substantial series of fish, shells, beetles and butterflies. It is evident that the original sheets have been trimmed when the volumes were bound.

Inscriptions in each volume record that they were originally presented in 1870 by Frederick Corbin to his second daughter, Mary Ann Mansell Lukis.

**Postscript.** The above lists are acknowledged to be incomplete and represent the current state of knowledge regarding the history of these extensive but poorly documented collections.. More information will undoubtedly come to light as the work of curation proceeds.

Perhaps, too, attention should be drawn to the main herbarium of local plants which remains in the care of La Société Guernesiaise. It was started in 1892 by the G.S.N.S. (which became La Société in 1926) and formed the basis for the publication of E.D.Marquand's *Flora of Guernsey* in 1901. The herbarium has been continually added to since then, as the botany section of the Société has remained consistently active. The herbarium is stored at the Société headquarters which was opened in a shared extension to the Guernsey Museum and Art Gallery in 1986. La Société also own and keep the island's most prized scientific collection, the Gosselin Herbarium of local plants. This collection was started in 1788 by Joshua Gosselin, a local crown official. It was presented to La Société Guernesaise in 1946 but sank into obscurity for many years until its relatively recent rediscovery and recognition as the main starting point for Guernsey botany (McClintock 1982).

## Acknowledgements

The writer would like to thank the many UK colleagues who have responded cheerfully to requests for information, particularly Pat Francis, Geoff Hancock, Steve Howe and Hugh Torrens. Staff at the Guille-Allès Library, Guernsey, have been most helpful, providing access to their archives and responding efficiently to frequent requests for information. The latter can also be said of Guernsey's Priaulx Library. The other staff at Guernsey Museum and Art Gallery have also shown great forbearance, answering frequent queries about the days before the staff included a natural historian. Lilla Desmond and Sandra Henderson translated the manuscript into a typescript, despite the author's handwriting and text alterations.

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# Beetling down to the jungle: a drama for the rainforest

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**The idea**

'What we need is a role playing exercise, a drama, a jungle drama!' I announced.

John looked out of the window, searching for stray bats. Julian began to develop an over-riding interest in his shoelaces. Glyn grumbled that we had no experience in such things; he didn't mind mask-making, or showing children live animals, but taking part in a play - well, that was quite another matter! Fortunately, there was some enthusiasm for the idea, and eventually we agreed that we'd try and seek some advice locally, and bring back some information to our next staff meeting.

Fig 1. Magnificent masks.

All this took place in late May, when we had decided to capitalise on the success of our current exhibition on the Rain Forest (borrowed from York - thanks to Paul Howard) by holding a 'Jungleweek' for children during the first week of the school summer holidays. This co-incided nicely with BCG's 'Beetle-down....' week, and publicity for it was guaranteed by persuading our local newspaper, the Newcastle Journal, to act as sponsors; we agreed to call our event 'Journal Jungledays', in return the paper gave us advanced coverage and printed the booking forms each Saturday for a month prior to the event.

The majority of the activities were relatively easy to organise; the 30 or so pre-booked children would be met in the entrance hall by a friendly gorilla who would extract their entrance fee (£l) and lead them on to be face-painted as jungle animals. The three hour session would then begin with a brief slide-show on the rain forest and its inhabitants, with a strong conservation message. Then, dividing the children into two groups, one would take part in a mask-making session using stencils of butterflies and lots of colourful, messy paint. Meanwhile the second group would meet live animals, including tarantulas, stick insects and an Indian python. They'd then swop activities, and afterwards come together to draw animals - both the live ones and mounted specimens from the collections. After a break for 'junglejuice' everyone would be encouraged to take part in the 'Jungledrama', following which they would receive a badge depicting a jungle animal on their way home, and we would collapse. This all sounds very easy. It wasn't.

**Creating the environment**

We had realised at the outset that for the week to be succesful we needed to create a jungle for the activities to take place in. Consequently our lecture theatre was stripped of its benches, and a small army of MSC staff and volunteers, guided by Dave Hall our Designer, began to prepare a giant rainforest mural around three sides of the room. The 'ends of roll' paper for this were again supplied by our Fairy Godmother, the Journal. A number of 'trees' (ie painted 4 x 2) quickly sprouted from the floor, and I mounted a raid on the local barracks of the Queens Own Yeomanry, coming away with sufficient camouflage netting to create a canopy. (It did cross my mind that if we went to war in the next few weeks some of our tanks could be a bit exposed, but that the Museum could be made a good bunker). More atmosphere was created by introducing a sound system with a continuous tape loop of jungle noises. The stage was set...well, almost...

**The jungledrama evolves**

Our quest for advice led us to the headquarters of the Drama Advisors for North Tyneside Education Authority. Far from being sceptical, which we had honestly expected, they were very helpful indeed, and even confessed that they had themselves wanted to create a drama based on the destruction of the rainforest, having been visitors to the museum, and realising the interest that had been shown by schools in the 'Jungle' exhibition. They explained the way they approached role play with large classes of children, and pointed out the need to keep control by careful scripting, and always to be prepared for the unexpected. We then outlined or ideas for the plot, essentially taking 'an expedition' to the jungle, where the children would meet and interact with 'an expert', and a 'developer' in the form of an official from the Forests Department. This we felt would enable us to explain the scientific importance of the forest, the fact that it is home to millions of people who make wise use of it for food, shelter and medicine, and give the opportunity to expand on the issues of rainforest destruction which we had touched on in our slide show. There was one major problem with this idea, the fact that our expedition could not be thirty strong - the jungle we were exploring was very small. So how could we involve all the children in the drama? One of the advisors came up with the idea of making the expedition relatively small, about eight children, chosen for their outgoing personalities; the remainder (those who might have been relegated to the role of audience) would observe the activities in the jungle from space in the role of aliens - it would be their judgement which would decide the fate of the rainforest. This seemed a sound suggestion, this way every child would have a role to play, and the fact that the youngsters had to make a decision about rainforests at the end added spice; the presence

Fig 2. The expedition finds Henri in the jungle.

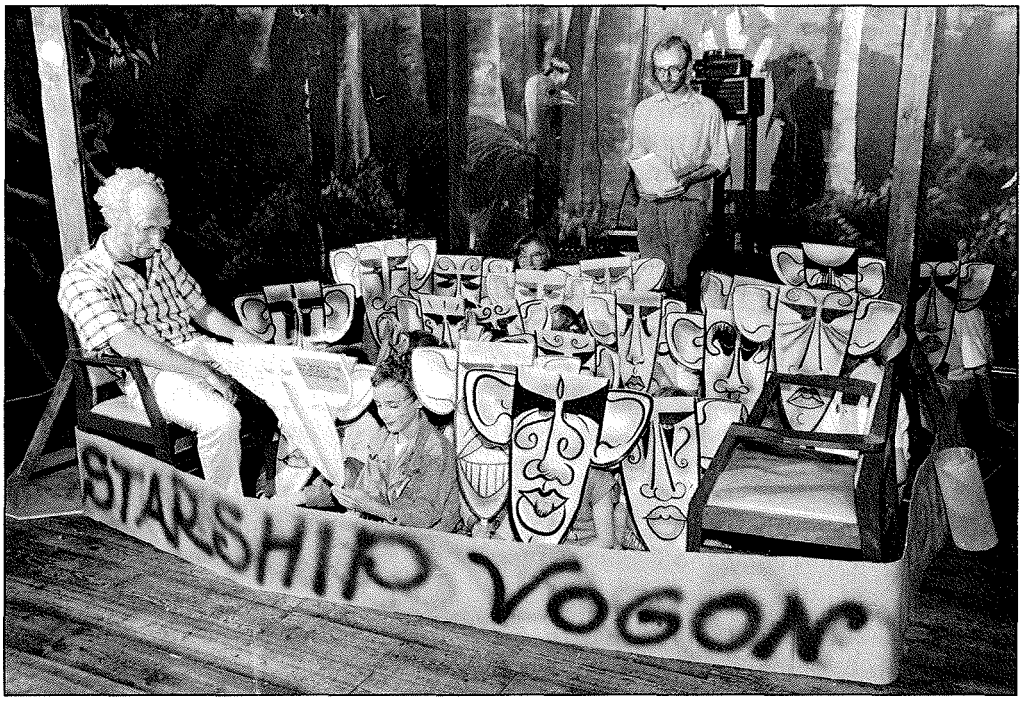


Fig 3. The starship lands.

of aliens also meant that we could create something which would appeal to the children, through costume and face-masks, and creating sound effects using a synthesiser, for their space-ship.

Armed with these ideas, I began to develop the characters and the plot. The limiting factors of space, time and manpower, coupled with my total inexperience of things thespian, made this no easy task. My first efforts were fully dissected and criticised at our staff meetings, and many of the more radical lines posed by the developer (I'd originally wanted to make him a real baddy) erased, and many other useful amendements made. Achieving the right balance in the plot was considered very important, and there was a need to introduce matters of economy, debt and renewable resources. Deciding if children could be expected to play lead roles was discussed; obviously much was going to depend on the children within each group, but we knew that we would have an opportunity to get to know them before we started the drama session. We decided to take the risk and give some of the children major roles.

The number of characters was limited to seven in the first instance; only five members of staff felt willing to make fools of themselves, and we decided that two children might be succesfully guided through the event with our help. The two roles allocated to them were the President of the Royal Rainforest Society, who would address the expedition before it set off for the jungle, and the Expedition Leader, Erik (or Ethel) Baker-Colobus, who would be helped with dialogue by one of us planted amongst the expedition members. One staff member would be aboard the spacecraft, to encourage the aliens on board, and to operate the sound and lighting effects in the cockpit. This left three roles to play, the leader of the Vogon (apologies to Douglas Adams) Expedition, Captain Purest-Green, The French anthropologist and Zoologist, Henri Pamplemousse, and the Government Forest Development Officer, Rodrigo Leach.

The basic plot was as follows. With the Vogons (complete with vogon masks and looking quite terrifying) aboard their starship, the scene is set as Herr Kutt, President, RRS, addresses the expedition members. Their leader, having talked to the children, leads them off to the 'stores' to obtain their equipment. Meanwhile, Capt. Purest-Green talks to the Intergalactic Planning Committee about their task ahead. As the starship comes in to land, the expedition then enters the jungle, and begins 'exploring'. Suddenly (!), Erik the leader falls to the ground, having been bitten by the deadly red backed furry spider. There is no antidote in the medical kit, the only hope of keeping Erik alive is to find Henri Pamplemousse; the expedition members begin the search. Henri is found, and of course knows immediately (Zese clevair leetle Frergs) that the cure is leaves of the Yoruba tree. Search and find leaves, return to Erik and administer cure, miraculous recovery ('Eat eez nurthing mon ami'), discussion of medicines from the forest. Enter Rodrigo Leech, ('What are you lot doing in my forest?') who announces he is going to cut down the trees to aid his country's economy; expedition tries to convince him this is not a good idea, and takes him off into the forest to prove it. The Vogons receive the advice of their manic and deranged Captain, ('Shall I activate the lazerpodules and blast 'em now eh?') and decide the fate of the rainforest on a show of tentacles. Starship noises, fin.

But would it work?!

Fig 4. The cast!

**The trial run**

We had approached a school at an early stage to act as guinea-pigs for a jungle session; we felt all along that this would be vital to assess timing, the success of the various activities, the reaction to live animals, and most importantly, to test out the drama session. A week beforehand, a nervous class of eight year olds met an even more worried Hancock staff, as we launched into our trial jungleday. Most of the three hour session went like a dream, the masks were a success, no-one collapsed as the live python made its appearance, the logistics seemed OK. Yes, the slide show was a bit too long, and we hadn't catered too well for sheepdogs to guide nippers back and forth from the toilet, but everything else went smoothly. Except the drama.

It wasn't a complete disaster, although one might consider the childrens' decision to zap planet Earth a retrograde step. We obviously hadn't got the message across. The decision to give children major roles was a mistake - their little voices just couldn't be heard by the Vogons. There was also a crying need to get the Vogons more involved, by giving them more dialogue. Some prompt cards were needed too, to get all the kids saying things. Most importantly, we had to either change the character of Purest-Green, which was aggressive, persuasive and dominant, or add a new character to counteract his Reagan-like stance. So it was back to the drawing board.

The greatest advantage of the trial run proved to be that those members of staff who had originally been content to sit in the wings, having seen the fun that the rest had had doing it, suddenly wanted to be involved. Would-be Vogons crept from the woodwork. Consequently, in the revised and final version, two new characters appeared, and more staff became either Vogons or members of the expedition, so helping the children to

experience the play by prompting them, talking to them, encouraging them. The two new characters were a native guide and healer, Tamandua, to accompany and help Henri, and the counter to Purest-Green, Lord Tharg, Leader of the Intergalactic Planning Committee. We retained the idea of giving children speaking parts, but reduced the number of words dramatically, and always made sure that individual youngsters were shadowed by someone who could help them if necessary. Vogonic involvement was increased by beaming Henri up to the starship for interrogation. Add to this minor variations in movement and dialogue, and we were ready for The West End. Well, the west end of Newcastle anyway.

**The real thing**

It worked! The revised version did the trick, the rainforest was saved, and we all had a wonderful time acting our socks off. By the end of the week the add-libs were flying thick and fast, and new and unexpected props kept appearing. I remember the realistic plastic vomit which suddenly appeared as Erik received the bite of 'Ze deadly spidur', and Tamandua's unsolicited comments about the skinny white legs of the expedition leader - 'He has legs of stick insect'. The children also kept us on our toes, the liveliest groups bringing home the warning about being prepared for anything. This isn't the place to give an account of all the funny or unexpected things that were said or done, but relish the thought of the Forestry Officer being verbally abused by small children because of his treatment of the rainforest, as one small but determined individual set about him with a pond net. Passions ran high!

**Learning lessons**

The first lesson - drama is a very powerful weapon to enable us to put across messages, even complex ones such as habitat conservation. Children are now used to taking part in such exercises, so perhaps we should be doing it more frequently, to good effect, within the field of Natural Sciences.

Second, you don't have to be a member of RADA to make it happen. Enthusiasm and a willingness to drop those inhibitions are more important.

Third, in terms of time, it can be expensive. Our Jungleday experience involved 13 people, in our case primarily volunteers and MSC staff. Add to this the time involved in making props, and creating the set, and the end result may not appear cost-effective. The children involved in Jungledays certainly got their £1 worth! It is impossible to consider events such as this in purely monetary terms; there can be no doubt that it was an important lesson for everyone involved, and in terms of creating team spirit it is highly recommended!

Finally, I suspect that the drama was succesful because it came at the end of a series of events which had set the scene for the children. Although it might have stood alone, the background information the children had received earlier, and the level of excitement reached, all helped to break down barriers and inhibitions, essential for its success.

PS. If anyone would like a copy of the script, please let me know! Any references to individual persons mentioned above, alive or dead or merely resting, are of course entirely true.

# The new zoology storage at Manchester Museum : an opportunity for a new curatorial strategy.

Charles Pettitt

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Recently Manchester Museum has completed a new store for the non-Avian Vertebrata collection and has created a new Invertebrata Resource Centre. The vertebrate collections have been rehoused but the massive task of rehousing the non-entomological invertebrate collections is still in progress; it is hoped to have all the material safely into the new store by summer 1989, and a ten year programme has started to re-curate the major collections to the highest standard possible within the constraints of available finance and curatorial time. This paper outlines the problems which gave rise to the need for the new storage, how the storage was planned and executed and also gives details of the curatorial strategy which is being implemented for the large Mollusca collection.

## The new storage

### The problem

At Manchester Museum until recently most of the zoology collections other than birds and insects were stored on the galleries, either on display or in drawers below the display cases. These mahogany drawers were large, very heavy, often too deep, difficult to work with in situ or to transport elsewhere, and a major security headache; all in all they could be said to fall well short of modern standards for the storage of museum specimens. Space was already at a premium when I arrived in Manchester in 1968 and recently acquired material had to be stored as and where one could. At the worst point prior to the completion of the new resource centre, the mollusc collection, for example, was stored at seven different sites around the Museum.

### The computer helps out

During the years 1978-1984 when I managed large Manpower Services Commission (MSC) funded teams cataloguing the Museum's collections (Pettitt, 1981), I had the label information of the entire molluscan collection entered into a database on the University mainframe computer (7). Although the information on many of the labels, and therefore in the database, is far from perfect, the database has already proved a boon, enabling me in response to enquiries, to find material that otherwise would have remained buried. For example, recently I received a request for sinistral *Cepaea*; I knew of one lot in the Stratton collection but a computer search indicated two more lots existed. Armed with the computer listing, all three lots, which happened to be housed on three different floors of the Museum, were located within thirty minutes. Thus during this period the computer database compensated in some measure for the overcrowded, piecemeal storage conditions. Computer databases were compiled also for the Acari, Bryozoa and Arachnida collections; input sheets have been prepared for the Foraminifera but not yet entered into the computer.

**The crises**

The displacement of material by the redevelopment of the bird gallery in 1980-81 produced the first crisis. Fortunately other changes at the Museum allowed the old botany gallery to be allocated for zoology storage, albeit only using the old display cases with similar drawers to those on the bird and invertebrate galleries. Some of the molluscs were brought down from the public gallery but there was insufficient storage for the whole collection, and even that part which was rehoused often had to be stored in two or three layers within a drawer. A second crisis occurred in 1985 with the start of the mammal gallery redevelopment, which displaced the remaining bone collection and also some large mammal mounts. At this point it became imperative that something radical was done to safeguard the long-term security and availability of the zoology collections at risk. Fig 1 gives an idea of conditions in the store at their worst.

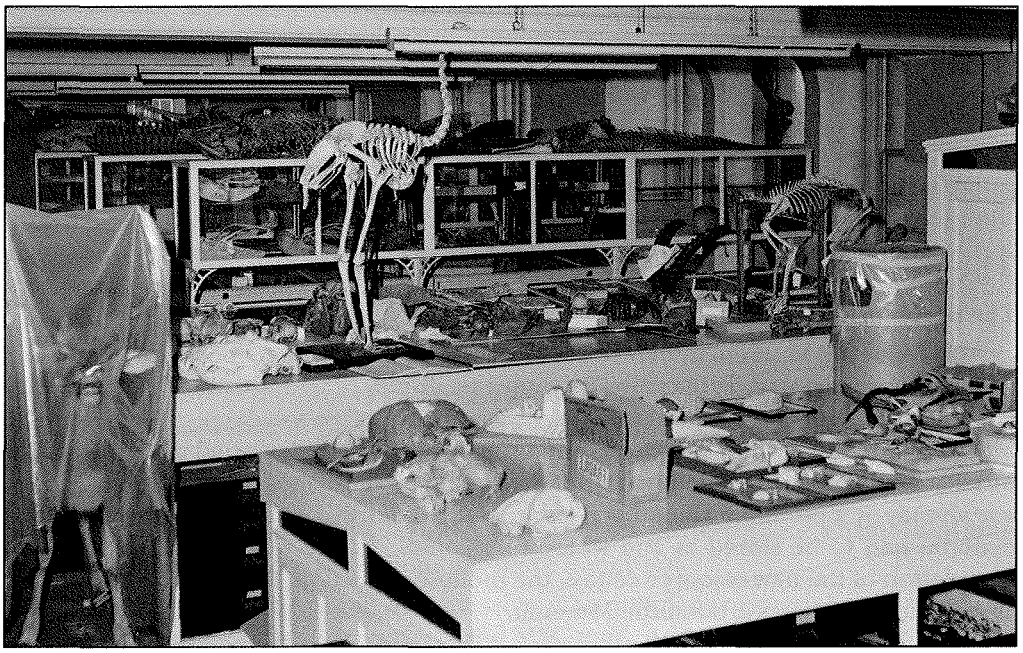

Fig 1. A view of the storage area before modernisation.

**The solution**

As luck would have it the Greater Manchester Archaeological Unit, which had for some years occupied an area of the museum annex, was given new accommodation elsewhere on the campus and the Museum Director reallocated the space thus released for additional zoology storage. At the same time, in view of the pressing need, he earmarked the Museum's annual capital budget for the University financial year from August 1987 for the new storage project; we were also fortunate in obtaining a grant of £4,500 from the Museums and Galleries Commission towards the work. Thus at last adequate storage for the collections could be provided; the total cost of the new bone store and the Resource Centre was £35,000.

***The vertebrate material***

The bird skins, mounts and eggs were already well housed in the museum annex, so it was decided to move the rest of the vertebrate material to the annex also. The new store is immediately adjacent to the conservation laboratories and since, on the whole, more conservation work tends to be needed on the vertebrate specimens than on invertebrate material, this move made sense.

Although a substantial sum had been made available, the budget was still tight and so a minimum was done to the new bone store: a flooring paint was applied to the cement floor, to reduce dust; the existing electrical fittings were retained, with some re-siting; and new double doors fitted across the end of the access corridor to improve security and environmental control. Dr Hounsome decided to use standard steel office storage cabinets, 1m wide, 0.5m deep and 1.8m high, to house the smaller specimens, and he was able conveniently to fit 36 cabinets into the available space. These have proved a most satisfactory and - with bulk purchase - a most economical solution for the efficient storage of bulky, dry vertebrate specimens.

***The invertebrate material***

The removal of the vertebrate material from the old botany gallery initially left an area of 8m by 20m for the storage of the non-entomological invertebrates. At the same time the run-down of the computer cataloguing unit made it appropriate for me to move my office nearer to the collections in my charge. At first I was going to return to my old office, off the mammal gallery and on the floor below the new store. However, a further grant of £10,000 from Book Club Associates allowed us to establish an audio-visual theatre in my old office; it is currently showing a 14 minute slide presentation on 'The World of Nature', as an introduction to the natural history galleries.

It was therefore decided that the old botany gallery should be converted into an *en suite* store, workroom, office and library; thus was the Invertebrate Resource Centre born, the aim of which is to bring together all the Museum's dry collections of invertebrates into adequate storage for the first time. Unfortunately, because of fire regulations, the wet, or 'spirit', collections still have to be housed in the Museum annex next door. The new Centre can accommodate the resident Keeper plus at least three visiting workers; the working space will be invaluable during the planned redisplay of the invertebrate gallery. Because of the added pressure on space caused by these improved facilities, it was decided that the main storage would have to be in the form of a compact storage unit; the final floor plan is shown in fig 2.

The logistics of the building operations were not simple, as all the material already moved to the old botany gallery had temporarily to be rehoused to leave a completely clear space for a new floor to be laid after the existing display cabinets had been removed. However, this had the advantage that all the material could be sealed against the inevitable dust caused by building works. 'Colour Matching' fluorescent tubes were specified for the overhead lighting in the store and working area (5), since when working with molluscan shells, in particular, colour is very important for discrimination and identification.

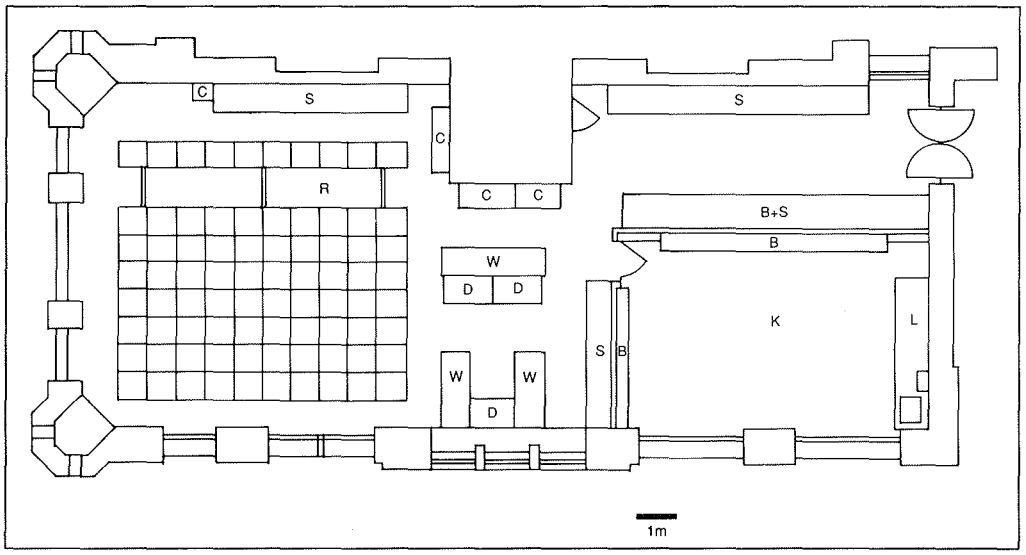


Fig 2. Sketch Plan of new Invertebrata Resource Centre at Manchester Museum. Key: B = bookcases; C = separate cabinets; D = desks for visiting workers; K = Keeper's office; L = laboratory bench; R = rolling compact storage unit; S = other storage; W = workbenches 1m high, with storage under.

***The compact storage unit***

It was decided that a compact storage unit, consisting of one fixed and four mobile sections, should comprise the main storage; the fixed section, and the outer mobile, are single sided, and the other three are double sided (fig 2). The sections are 6.8m long and 2m high, and each usable side has 10 vertical stacks holding a maximum of 21 drawers, giving a capacity of 8 x 10 x 21 = 1600 drawers. Only 1200 drawers have been purchased in the first instance, however, as larger specimens have to be accommodated by leaving out the drawer above, and also some of the space is being used to store small cabinets. The drawer runners are presently fixed at 9.0cm centres but can be adjusted at 4.5cm centres if required. The unit was supplied and erected by BEL Industries (now part of the APEX Group) (1), general views of the new store are shown in figs 3 and 4. The whole area, apart from the Keeper's office which is carpeted, has been laid with resilient vinyl flooring (6) and this flooring is continued under the compact storage unit, the tracks of which have been set flush to allow trolley access without jolting the specimens.

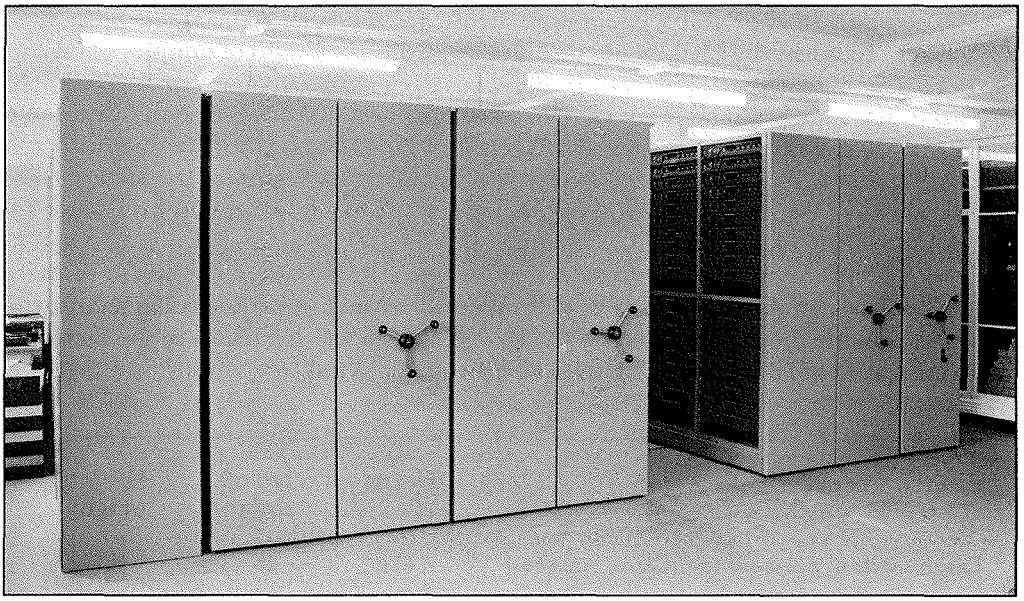

Fig 3. The new compact storage unit.

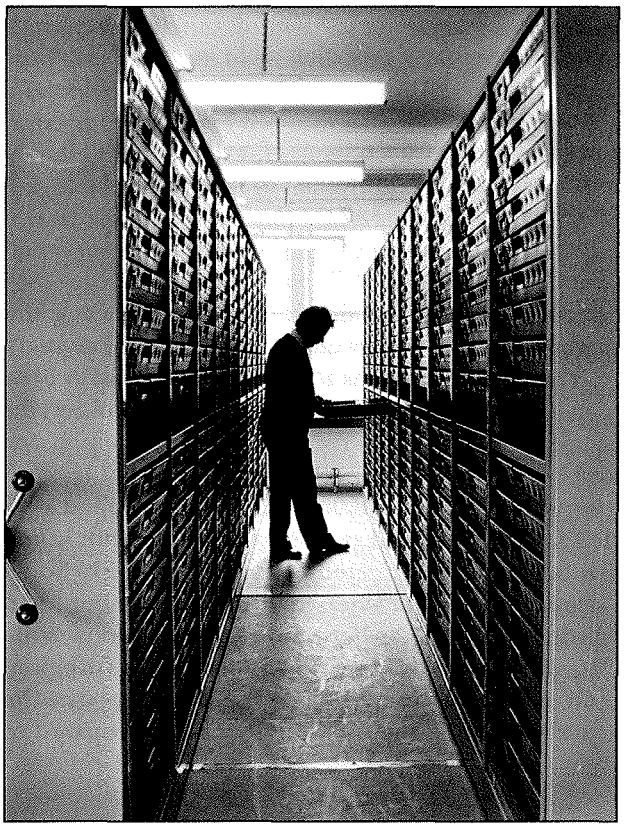

Fig 4. The new compact storage unit in use.

The compact storage unit is being used mainly for the large (60,000 lots plus) shell collection. To satisfy the Civil Engineer, I measured the net weight of samples of various drawers of molluscan specimens of differing natures, eg some with many small specimens in glass tubes, some with medium sized material mainly in glass topped boxes and some with just a few large and heavy specimens (Table 1). I then assessed the proportion of each of these drawer types in the collection to arrive at a total net weight for the collection as a whole; adding the tare weight of the compact storage unit gave a point loading of 4.0 Kilonewtons (Kn) on each wheel of the unit. It was sobering to realise that one had to move nearly 4 tons of molluscs from the old to the new storage! The result of these calculations caused the Civil Engineer to insist on additional steel joists being set into the floor beneath the three rails; one day was allowed for this but the quality of the Victorian concrete was so good that it took a week to complete the task!

| Contents of drawer | Net wt | | No of drawers | | Subtotal weight |
|---|---|---|---|---|---|
| Large shells in polybags (eg. *Cassis, Strombus*) | 4.2kg | x | 25 | = | 105kg |
| Small metal glass-topped boxes | 4.2kg | x | 40 | = | 168kg |
| Small shells in card glass-topped boxes | 3.5Kg | x | 500 | = | 1750kg |
| Small to medium shells, in glass-topped pill-boxes and in glass tubes stacked in card trays | 2.3kg | x | 875 | = | 2012kg |
| Estimated total weight of collection | | | | = | ca. 4000kg |

Table 1. Mean net weights of the contents of 0.6m x 0.6m drawers of molluscan shells, inclusive of their immediate containers, the estimated number of each type in the Manchester Museum collection and the total net weight of the collection.

The unit was delivered in prefabricated parts and erection took less than a week; the external cladding is sheet steel covered with sage green coloured 'Plastisol', giving a pleasant, 'leatherette', appearance. The moving sections roll smoothly and with little effort, even when full, and the unit can be fastened and locked in the closed position for security. The 60cm x 60cm drawers are made of high density polyethylene, which our Keeper of Conservation has declared both chemically inert, and stable for at least 20 years. They are formed over a rectangular lip-frame of 8.0mm diameter polished steel rod and have cut-outs in the plastic to provide a front pull, together with side lifting handles for safe carrying when full; a label holder is riveted to the front (fig 5). Some 'bellying' of the plastic floor of the drawer takes place when loaded; on the other hand their cheapness and low weight are distinct advantages when compared to drawers made of more conventional materials. The weight factor was critical with our installation; wooden or chipboard drawers could well have pushed the total weight above the maximum floor loading of 4.8 Kn. per wheel that the Civil Engineer was prepared to tolerate, even with the steel joists.

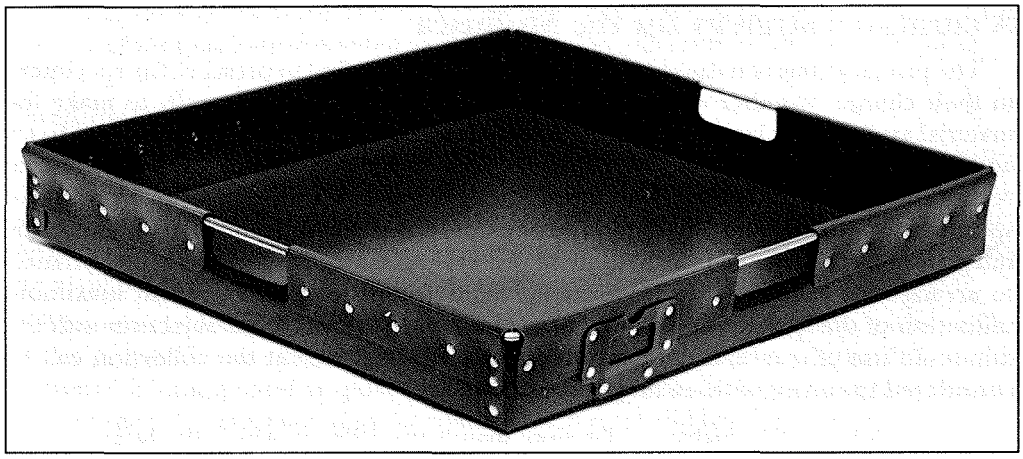

Fig 5. One of the plastic drawers from the compact unit, showing method of construction.

Dust proofing of the mobile store was not thought to be practicable, so we have concentrated on the reduction of the ingress of dust, or dust prevention; the measures adopted can be considered as nested to a depth of three. First, it is hoped progressively to install secondary glazing to the external windows of the store, to reduce ingress of dust (and of pests) into the general storage area. At the same time, as far as possible, all cracks and crevices have been sealed and the general environment designed to minimise the generation, or harbouring, of dust. Next, all the gaps between the enamelled steel panels forming the top of the unit have been sealed with an electrical insulation tape, which should have a life of 10-20 years (2). A rubber-based moulding (3) is fitted to the front edges of the sections so that when closed the gaps between the sections are sealed; again, the design life of the material is a minimum of 20 years. APEX Ltd. can supply a lockable tambour roller shutter fitted to each vertical bay, which would have given even better dust prevention and added security. Unfortunately these shutters were too expensive for our budget, although they can be fitted retrospectively if required. Finally, inside the unit all the specimens will be kept in either boxes with lids, glass tubes plugged with cotton wool (8), or in resealable polythene bags.

The Halkyard Foraminifera, the Waters Bryozoa, the Britten Acari and the Mackie/Freston Arachnida collections are already adequately housed in suitable cabinets, which have now been sited conveniently within the new resource centre. The other groups, such as the corals, echinoderms, and arthropods will be accommodated in new storage converted from pre-existing old botany gallery wall cases which have been left in position and also in some good cabinets freed as the large shell collection is recurated as explained below. Measures are also in hand to improve the dust prevention characteristics of these wall cases and of those freestanding cabinets which will remain in use. Some smaller cabinets - such as the Jelly Bryozoa slide cases - have been installed within the fixed section of the new compact storage unit.

## A curatorial strategy for the Mollusca

The primary aims of natural history curators should be first to preserve the specimens in their charge, together with any associated information, and secondly to make the material available for legitimate use, when this does not conflict with the first aim. To try and achieve these aims, a curatorial strategy has been planned for the major task of recurating the shell collection, with the following objectives: to minimise the handling of specimens (both now and during any future expansion of the collection), to maintain the integrity of any associated information, to preserve all material evidence of provenance, to arrange for specimens to be located readily when needed, to permit maximum utilisation of the specimen information, and, finally, to reach these objectives with the minimum use of scarce, finite curatorial resources. At present the collection can be considered to consist of three main parts:

1. **The 'old' or 'Darbishire' collection**; mainly pre-1930, of which the large bequest from RD Darbishire forms the basis.
2. **The 'special collections'**; a number of disparate collections, principally distinguished by being from restricted geographical locations; examples are the Haddon (Torres Straights), Hadfield (Lifu), and Townsend (Persian Gulf) collections, and other unnamed ones such as the 'Falklands', or the 'Tierra del Fuego', collections.
3. **Some general collections**; mostly acquired post-1945, which are still stored in their original cabinets, or which, because of the pressure on space, are either stacked in the boxes in which they arrived at the museum, or else have had to be packed inaccessibly several layers deep within some of the original storage drawers.

I have decided to incorporate the vast majority of this material into one series, arranged according to the currently accepted taxonomy. The only exceptions will be type material, already housed separately in a secure cabinet, and, for the time being, the Townsend collection, which appears still to have considerable potential for further research. The superfamily will be the main division used.

### Curatorial strategy: phase one

The 'old' collection is currently being rehoused in the compact storage unit, superfamily by superfamily. Since the old collection is arranged largely according to the taxonomy of Theile (1937), several of the present groupings are having to be split between two or more of the modern superfamilies; the nomenclature on the existing labels is often out of date, which complicates the task of reassignment. Fortunately, however, with the aid of some of the MSC funded staff, I had previously compiled a computerised data dictionary of generic level molluscan names. From this I have prepared an alphabetical listing of genera and subgenera, together with their current superfamily assignment and an indication whether the name is current or a synonym. This dictionary of genera has already saved many hours of curatorial time; it is constantly being updated as new names or changes in the position or validity of existing names, come to my notice.

I am leaving the same number of drawers empty at the end of each superfamily as are occupied by specimens from the old collection, on the assumption that the proportion of material in each superfamily will be similar in the remaining smaller collections to the proportion present in the old collection. One extra block of empty drawers is being left

halfway along and one at the end of each section of the compact store, to reduce the the amount of reorganisation needed as, hopefully, the collection continues to expand.

**Curatorial strategy: phase two**

Once all the old material is rehoused, then work will begin on incorporating the remaining collections one by one; the initial objective is just to assemble all the specimens of a given superfamily together into one place, without any attempt at this stage to order the material within the superfamily. For this work both the data dictionary of genera, and the main database of molluscan specimen information, will be pressed into service.

When the database of label information was compiled by the MSC team, each sample, or 'lot', of shells was assigned a running serial catalogue number; each of these 'lot numbers' is unique and is quite unrelated to any previous accession or registration numbers already associated with the specimens. A small slip bearing this lot number was included with every sample; during the cataloguing these slips helped to prevent mistakes such as lots - or even whole drawers - being missed, or catalogued twice. In the five years since, the collection has been moved around and new material has been acquired, so now the slips are invaluable for confirming what has, and what has not, been computer catalogued. During the years I have been using the database to help trace material, I have found that when hunting through a drawer it is the lot number which is most easily recognised; it is much easier to spot than the often semi-legible names on the original labels. Unfortunately these lot number slips were printed on a dot matrix printer with a fabric ribbon and the ink used is proving light fugitive. However, provided care is taken not to leave the samples in strong sunlight - not good curatorial practice anyway - the numbers should remain legible until new, more permanent, labels are produced under phase 3 of the strategy (see below). Throughout the remainder of the paper I will use the term 'lot' to indicate a sample of one or more specimens from a single field collection event, stored in one container; one computer entry was generated for each lot. For each collection in turn the relevant entries will be retrieved from the database so that various sorted listings and indexes can be formed from them, to assist the curation.

Using the dictionary of genera, a three figure 'biocode' will be added to each entry, where this has not already been done; this biocode identifies the superfamily to which the specimen is now allocated. The biocodes used at Manchester are identical to those prepared and used in the natural history departments of the National Museums of Scotland and I am grateful to David Heppell of the NMS for providing the codes and giving advice on their application (Heppell, 1989). The importance here of the biocode is that it allows the entries to be sorted and listed in taxonomic order and working from the sorted listing all the material of a given superfamily can quickly be picked from the various drawers of the small collection being dealt with, and moved en bloc to its correct place in the new storage. Trials have shown that this method is far quicker than working through the small collection specimen by specimen; it also reduces the amount of handling the specimens receive during this operation, lessening the risk of damage. Also the overall utility of the database will be increased as the biocoding is completed, section by section, making future searches more efficient.

As each smaller collection is broken up in this way, all the specimens will have an extra label added recording its source collection. These labels are being produced in house by word processing the collection name repetitively to fill a master A4 sheet, and then reproducing this xerographically using archival quality A4 paper (4). Recently HMSO,

at our request, has examined the problem of producing archival quality documents and labels using word processors and they have recommended the above method. Best results are achieved using a daisywheel printer for the master sheet but a reasonable dot-matrix printer (particularly a 24-pin one) used in 'NLQ' mode, gives acceptable results. By using a photocopier with reduction facilities, it is possible to make the print smaller than the usual 11-12 point typeface produced by most printers. I rejected this idea because the resultant small labels were not only more difficult (and time consuming) to manipulate but also became hidden more easily by the specimens.

**Curatorial strategy: phase three**

Once all the small collections have been incorporated, then phase 3 will begin, with each superfamily being dealt with as a unit. Once more the entries covering the block of material will be extracted from the database and globally edited to add the biocode where it is still missing. Then, again with the aid of specially prepared listings and indexes, the entries will receive a locality code if this is missing. Adding a hierarchical locality code in this way allows the information to be indexed, sorted, or retrieved, efficiently by locality. Coding is a great deal more economical of curatorial time than laboriously editing the full locality field to concord the information, and also the coding approach maintains the integrity of the original information, which I consider should be sacrosanct; for further discussion of the philosophy and application of sort/search codes to museum databases, see Pettitt (1989).

At this stage it is intended to subdivide any superfamily that contains a large number of lots, to simplify future usage of the collection. Thus for some large superfamilies the formal groupings could be at the level of family, subfamily or even of a single genus. In the chitons, scaphopods and cephalopods, which are more sparsely represented in the dry collection than the other classes, suitable taxonomic levels above superfamily will be used, again with the objective of providing 'pigeon-holes' that contain a useful but not excessive, amount of material. Initially 500 lots will be used as the 'break point', although this may be reduced in the light of experience. When a superfamily is subdivided, the relevant biocodes will also be extended in the database, to reflect the subdivision. Finally, each of the resulting grouping of lots will be rearranged into lot number order within its drawers, rather than in the more usual alphabetical-under-taxon order. A fresh, distinct, archival quality label giving the lot number and the biocode will be computer produced and added to each lot as it is sorted, replacing the present, fading, lot number slips. Using an arbitrary numerical order means that fresh lots are just added at the end of the series within the relevant grouping, thus avoiding unnecessary handling of the existing material shuffling everything around to make room for the latest additions.

As should be clear by now, our molluscan collection is an amalgam of material from many sources and not unnaturally individual lots are held in a wide variety of containers, such as open card or folded paper trays, card, wooden or metal glass topped boxes, glass tubes, pill boxes (with or without glass tops), and, for the larger specimens, resealable polythene bags. This heterogeneous assemblage of containers has to be lived with for two reasons:

1. The time and money needed to change a collection of this size over to a standard set of containers is just not available and even if these resources were available I believe they could be more usefully employed on researching the specimens to enhance their scientific and historical value.

2. While any original labels are always preserved, in many cases some of the provenance of the specimens resides in the precise type of container used, and/or in the handwriting or format of the information written directly on a container; in some cases even the colour or quality of the cotton wool used is characteristic of a particular collector. Should the destruction of an original container become necessary, for example because of pest infestation or water damage, then all written information on the container is captured by photocopying, and added to the information stored with the specimens, together with a full description of the container.

To bring some order to the present chaos, a supply of 4.5cm deep card trays has been obtained, in a modular range of sizes to fit the new storage drawers. These trays will be used to hold the variety of smaller containers and allow them to be organised into columns within the drawers.To minimise any waste of space, sometimes more than one layer of very small containers, such as pill boxes or glass tubes, will be allowed in a tray if they form a numerical sequence but then a tray label will be added giving the range of numbers held in the tray, to aid picking and refiling. Some of the oldest material was still held in open containers, and these specimens are being secured within resealable polythene bags.

The normal method of retrieval at Manchester is to obtain a computer list of the required material, which takes only a few minutes and then to pick the lots from the drawers using this list. As was mentioned earlier, I have already found it far quicker to hunt for a number than to scan the variety of original labels for the taxon, which is often only semi-legible; having the lots arranged in regular rows in numerical sequence should make picking even quicker. Perhaps an even more important advantage is the ease with which lots can later be slotted back into their correct place. It is probably a reflection on my ability, but I tended to have some difficulty in locating the correct place when replacing returned loans in the alphbetically arranged 'old' collection. Refiling lots is a tedious task and it has a tendency to get left while more important (ie less boring) things are done; since the numerical system makes the job easier and quicker perhaps it will get done sooner, thus reducing the time that the specimens are at risk lying around out of protective storage.

Finally, every lot will have a label showing the biocode as well as the lot number and since the biocodes run sequentially through the collection, finding the correct place for a lot is simple, even for non specialist helpers, who may have little or no knowledge of the phylogenetic sequence of superfamilies, etc, and who are unfamiliar with latinized taxonomic names.

The numerical arrangement is not as easy to browse as the alphabetical-by-taxon arrangement, a disadvantage for casual visitors, but as no grouping will contain more than 500 lots, browsing would not be completely impossible. However, visitors who give notice will be encouraged, before coming to Manchester, to use computer produced listings to identify the specimens they wish to see; then when they arrive the material will already be laid out, enabling them to start work immediately and so allow them to make the best use of their - usually limited - time.

The computer listing also serves as a checklist of the material provided to a visitor; most visitors are totally trustworthy but the knowledge that the list is available and will be used to check the material at the end of the visit, may help to discourage the occasional less ethical person from attempting to 'liberate' a rare specimen or two.

**Curatorial strategy: phase four**

This is where the work finally becomes intellectually stimulating, for at last it will be feasible to make a full revision of a group, bringing the nomenclature up to date, and, where necessary, enhancing the database entries with additional information gleaned by the research. However, to maintain the integrity of the original information present with the specimen, that information will remain in the database unchanged and any new information, such as a revised taxon, enhanced locality, or other 'research event', will be indicated as such, for the benefit of future workers, particularly those consulting the database at a distance from the collection. Because I want to bring the whole collection up to the highest possible level as quickly as possible, a deadline will be set for each group when it enters phase 4; any problems which are still unsolved when the deadline is reached will be left for the time being and the next grouping moved to phase four. However, the remaining problem entries will be flagged in the database and also copied over to an 'inquirenda' database, so that work can continue on them as the opportunity presents. It may be, for example, that advantage can be taken later of a visit to another museum or library to solve a problem beyond my resources in Manchester, or that subsequently a visitor to Manchester can rapidly dispose of some problem that has had me puzzled. Pacing the work in this way should ensure that the whole collection is worked through in a reasonable time and that it does not come to resemble the curate's egg, with some favourite groups polished to the nth degree and others still a total muddle. However, it is envisaged that groups will not enter phases 3 and 4 in phylogenetic order, starting at the chitons and progressing steadily through to the cephalopods. Instead I will rank the groups in priority, depending on such factors as the availability of a modern monograph and the proven demand for the group from the loan record. I intend doing some small groups first, to test the strategy more thoroughly.

When the phase 4 deadline is reached, then fresh, archival quality labels will be printed out for all the lots in the group. Colour coding of labels was considered but rejected. Colour coding on class is redundant since all lots will eventually carry their biocodes giving the supra-generic classification and colour coding on locality, such as white for British, pink for European and blue for non-European is considered an unnecessary complication, since specimens can readily be retrieved separately by these geographical areas using the hierarchical locality codes in the computer database.

Finally, provided more than, say, 95% of a group has been successfully revised, at the end of phase 4 it is intended to produce a Handlist of specimen information; the medium, format and method of distribution of these Handlists to the Collection are still under discussion. However, although they would be produced in random order, they will be numbered according to the biocode, so that the series would assemble into a coherent whole. It is debatable whether the Handlists should be published in the accepted sense, as the computer database from which they are produced is likely to be updated frequently as more information becomes available or more material is added, so that any published list is likely to get out of date quite quickly. In this respect, the Handlists are akin to taxonomic catalogues, and I agree with Kohn (1983) that it is better to keep information of this nature in machine readable form and to print it out only on request. Perhaps once the revision of one of the major sections - such as the prosobranchs - has been completed, there might be a case for producing the full list in microfiche for distribution to major museums.

**Summary of the curatorial strategy**

**Phase 1.** Rehouse 'old' collection in new storage, mostly arranged by modern superfamily using dictionary of genera, leaving space for the incorporation of remaining collections.

**Phase 2.** Incorporate the smaller collections one by one, retrieve relevant database entries using lot number, fill in missing biocodes, add source collector label to lots, move material to new storage by new groupings.

**Phase 3.** Working group by group, retrieve relevant database entries, globally add missing biocodes, and fill in missing locality codes; for large groups subdivide into smaller (<500) groupings, and modify database biocodes accordingly; lastly arrange material into lot number order within each final grouping and add computer produced biocode/lot number label to each lot.

**Phase 4.** Fully revise each group as far as practicable in a pre-planned period, and update database entries; at end of revision period copy problem entries to inquirenda database, computer produce fresh full labels and add to lots, prepare and make available Handlist to the group.

**Scheduling of work**

It seems sensible to complete phase 1 before starting phase 2, and similarly it would mean some double working to try and start phase 3 before phase 2 was complete. However, it is expected that phases 3 and 4 will, to some extent, run concurrently; advantage would be taken, for example, of the presence of a visiting expert to obtain their help with a group in which they specialise, even if that group had previously held a lower priority.

**Conclusions**

Staff time is probably now the most precious commodity in a museum and so we must be prepared to adopt new methods of working that preserve this precious resource, even though this may make the collection less convenient for a visiting worker. Although phases 2 to 4 of the Strategy are presented in the future tense, a pilot run has been done on a small amount of material, and all the methods outlined above seem to work satisfactorily. However, part of the reason for writing this paper has been to spark some debate on how we can make more effective use of the scarce time of trained curator staff and I would welcome any constructive criticism or comment on my strategy.

## Acknowledgements

I thank my colleagues Dr MV Hounsome, Keeper of Zoology and Mr V Horie, Keeper of Conservation, for their help while writing this paper. The Manchester Museum gratefully acknowledges the help of the Museum and Galleries Commission, the Estates and Services Department of Manchester University, and BEL Industries (APEX Group) in completing the storage project.

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Theile, J. (1929, 1934). *Handbuch der Systematischen Weichtierkunde.* 2 vols, Gustav Fischer, Jena.

## Footnotes

1. The supplier of the Compact Storage Unit was APEX Storage Systems Ltd., Congleton, Cheshire CW12 4YA. Phone: 0260 274044.

   Two other firms who will quote for similar equipment are:

   Brynzeel Ltd., Pembroke Road, Stocklake Industrial Estate, Aylesbury, Bucks HP20 1D. Phone: 0296 395081.

   RACKLINE Ltd., River Dane Road, Eaton Bank Trading Estate, Congleton, Cheshire CW12 1UN. Phone: 0260 281010.

2. The sealing tape used is 'Rotunda' 2702 Black PVC, 0.14mm, 75mm wide, with an adhesion to steel of 2.4 N/cm and a neutral, pH 5.5-8.0, adhesive whose minimum life should be 10 years.

   Supplied by Titan Tape Technology Specialists, Whitefield Road, Bredbury, Stockport SK6 2QR. Phone. 061-494 1344.

3. The sealing moulding made of a compound called 'Levaflex', manufactured by Bayer and conforming to DIN 4102 class 2, and to the motor vehicle manufacturers standard FMVSS 302. The moulding was bought in by APEX Ltd.

4. The archival quality paper we use is 'Atlantis Copysafe'; this is wood-free cellulose fibre, acid-free, minimum pH of 7.5, buffered with calcium carbonate. Supplied by Atlantis, Gullivers Wharf, 105 Wapping Lane, London E1 9RW. Phone 01-481-3784 (NB minimum order £50).

5. Specification of 'Colour Matching' Fluorescent Tubes. We installed GEC Colour Matching tubes (CRI = 91; Colour Temperature 6,500K.). These emit substantial amounts of UV (150 micro-Watts/lumen) but this emmission is considerably reduced, to 40 micro-Watts/lumen, by the polystyrene diffusers. These tubes, or their equivalent, should be available from most electrical wholesalers.

6. Specification and Supplier of Flooring.

   'POLYFLOR XL' 2.0mm thick polyvinyl covering, all seams welded to provide jointless floor. Supplied by: James Halstead Ltd., P.O. Box 3, Radcliffe New Road, Whitefield, Manchester M25 7NR. Phone: 061-766 3781.

7. Database compiled using the FAMULUS77 database management package, running on an AMDAHL 5890-E under the VM/CMS operating system.

8. Cotton Wool. We use 'wool' that is made of pure cotton, because the high sulphur content of the viscose fibres often added to cheaper grades of 'wool' can cause damage to specimens particularly when in a small, enclosed space such as a glass tube. Also the pure cotton grade is softer and less likely to catch and damage delicate spines, hairs etc. when the specimens are removed from the container.

# Summary of 'Biological Collections. UK'

Steve Garland

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## Introduction

This is an attempt to summarise the main facts of this report. I hope that these notes will be of use. BCG now has a review copy which can be circulated to interested people. Copies are still available and Museums Association members can obtain them from the M.A., 34 Bloomsbury Way, London WC1A 2SF, price £35.

The full report is 600 pages long so it must be remembered that this summary is somewhat brief! Figures quoted are correct but I have obviously shortened verbal descriptions greatly. Check the original report before quoting!!

## The report

Questionnaires were sent out between December 1983 and May 1984 to 672 museums. 604 (90%) were returned and were broken down as follows:

| | |
|---|---|
| No biological collections | 308 |
| Biological collections only | 232 |
| Biological collections & full-time Natural History Curator | 64 |

Museums with biological collections have been classified in eight groupings. Groups 5, 6 and 7 contain only museums with natural history curators, all other groups have none. They are summarised briefly as follows:

| | |
|---|---|
| **Group 1** | Small museums. Little commitment to natural history. Few specimens. |
| **Group 2** | Some natural history activity. No future direction apparent for natural history. Little curation. |
| **Group 3** | Some people available to work on natural history material. Significant collection size. Often receiving new material from research or survey work. |
| **Group 4** | Special cases where, although there is no post for a full-time curator of natural history, there is a marked museum commitment to the section. |
| **Group 5** | Museums or collections with at least one full-time natural history curator but activity restricted for a variety of reasons. |
| **Group 6** | Usually more than one full-time natural history curator. Collections large. Museum undertaking a wide range of natural history activities. Providing sound service to the community. |
| **Group 7** | The most active museums. Very large collections including type specimens. Undertaking wide range of activities including sound scientific work. Providing very good service to the community. |
| **University etc.** | A group of research institutes etc. with no natural history curators. Many possess large collections with type material. |

## The museums

Groups 1 and 2 are ignored. Appendix XIII lists all museums in all groups.

**Group 3** (16 Museums)

Tenby Museum
Angus District Museum (Montrose)
Philipps Countryside Museum
Carmarthen Museum
Falkirk Museums
Dover Museum
Luton Museum
Bournemouth Museum
Buxton Museum
Worcester City Museum
Kirleatham 'Old Hall'
Gray Art Gallery & Museum
Saffron Walden Museum
Royal Institution of Cornwall
Wood End Museum (Scarborough)
Oldham Museums

**Group 4** (21 Museums)

Dorman Museum (Middlesboro')
Kendal Museum
Warrington Museum
Kirklees Museums
Rochdale Museum
Lynn Museum
Woodspring Museum
Museum of London
Powell-Cotton Museum
Oxfordshire County Museum
Linnean Society
Shropshire County Museums
Dorset County Museum
Wiltshire A & N H S Museum (Devizes)
Carlisle Museum
Swansea Museum
Torquay Museum
Manx Museum
The Educational Museum
Chelmsford & Essex Museum
Wellcome Museum of Medical Science

**Group 5** (14 Museums)

Cleveland County Museums
Inverness Museum
Perth Museum
Southend Museums
Maidstone Museum
Scunthorpe Museum
Lancashire County Museums
Birmingham Museum
Somerset County Museums
Bedford Museum
Canterbury City Museums
Paisley Museum
Newport Museum
Yorkshire Museum

**Group 6** (22 Museums)

Cliffe Castle, Keighley
Horniman Museum
Warwickshire Museum
Reading Museum
Rotherham Museum
St. Albans Museum
Lincoln City & County Museum
Buckinghamshire County Museums
Hampshire County Museums
Royal Albert Meml. Museum (Exeter)
Harrison Zoological Museum
Kingston upon Hull Museums
Derby Museums
Hereford City Museum
School of Animal Biology, UCNW (Bangor)
Plymouth City Museum
Bankfield Museum
Passmore Edwards Museum
Portsmouth City Museums
Oxford Univ. Museum (Zool)
Univ. Coll. London Museum (Zool etc)
Birmingham Univ. Geol. Museum

**Group 7** (27 Museums)

Sunderland Museum
Univ. of Reading Herbarium
Herbert A.G. & Museum, Coventry
Leeds City Museum
Dundee Museum
Stoke on Trent City Museum
Sheffield City Museum
Ipswich Museum
North Herts Museums
Booth Museum (Brighton)
City of Bristol Museum
Doncaster Museum
Glasgow A.G. & Museum
National Museum of Wales
Hope Entom. Collns (Oxford)
Nottingham Museums
Leicester Univ. Herbarium
Leicestershire Museums
Bolton Museum
Hancock Museum (Newcastle)
Ulster Museum
Colchester & Essex Museum
Norwich Castle Museum
Royal Scottish Museum
Manchester Museum
Merseyside County Museums
Univ. Museum of Zool. (Cambridge)

## Staffing

### Curatorial posts

Of the 64 museums with posts: 27 have one post,
17 have two posts,
7 have three posts.

The rest have four or more posts (one has sixteen).

There are a total of 101 zoologists, 29 botanists, 10 biologists and 19 geologists. Entomology is the most popular specialist area in museums.

Pay scales are compared. The wide variety of scales is apparent and the gulf between scales in city/county museums and national/university museums is very noticeable.

### Technical posts

Only 33 of the 64 museums with curatorial posts have technical staff available to work on natural history. Seventeen of the 27 Group 7 museums have access to technicians working in natural history departments.

### Volunteers

It is stated that insufficient use is made of volunteer help. Natural history volunteer use is well below that in other subject areas.

### MA Diploma

Twenty-two of the 64 museums have no natural history staff who hold the Diploma. No university/research collections curators hold the Diploma.

### MSC Staff

From 1978 to 1983 as many natural history MSC person - years were used in museums as natural history curator - years. (What does this mean now that ET is here??)

## Collections

This chapter of the report contains numerous facts and figures. I have extracted only a few. A full list (Appendix XIX) is provided of all 296 institutions' collections. The collections are categorised as 0 (none), small, medium, large and very large. The collections are listed by type - these being Insects, Molluscs, Invertebrates, Vertebrates, Non-vascular Plants and Vascular Plants. A number of museums are named in this section; especially those that have large collections but fall into lower groups than their collections warrant due to inadequate staffing or funding etc.

Of Group 1 to 3 museums Saffron Walden, Worcester City, Wood End and Darlington Museums all hold some large collections. Saffron Walden Museum is the biggest anomaly as its collections are of a size comparable with Group 6 museums, and larger than some Group 7 museums. The report suggests the appointment of a natural historian or the transfer of its collections to a museum with natural history curatorial resources.

An estimated 1 to 2.5 million biological specimens are housed in Group 1 to 3 museums and are, therefore, at risk due to lack of biological curatorial expertise.

Group 4 museums include the Museum of London, Dorset County and Carlisle Museums which all hold very large or large collections of more than one animal or plant group.

Group 5 museums include five holding large or very large natural history collections. These are Perth,, Maidstone, Yorkshire, Inverness and Birmingham Museums.

### Type specimens

Three Group 2 or 3 museums hold type material. At two of the three it was impossible to distinguish the types. In addition, two Group 5 and three Group 7 museums do not clearly mark types. These museums are not fulfilling their function of safeguarding this material.

### Current acquisitions

A large amount of information is included on the growth of collections. This follows the museum groupings with a few exceptions. There are no Group 1 or 2 museums acquiring significant natural history material whereas Group 7 museums are most active. There are, however, five museums with no natural history curator acquiring potentially valuable material from research and survey work.The acquisition of local, British and foreign material is discussed with tables breaking it down by museum group, collection type, etc.

## Availibility of specimens in biological collections

### Physical accessibility

In 12 of the Group 7 and 15 of the Group 6 museums lack of space impedes research. This obviously affects curation too. The working party judged that only 28 museums had adequate facilities for visitors to work on the collections. Of these 22 are Group 7, 4 are Group 6 and 2 are Group 5. The five inadequate Group 7 museums are two national and three local authority museums. They are Bolton, Ipswich, Glasgow, Ulster and the National Museum of Wales.

### Documentation

One fifth of museums with natural history curators do not regard documentation as a priority activity. Biological recording and display work are the two main overriding priorities.

Four Group 5 and one Group 6 museum reported that none of their biological material was catalogued. No Group 7 museums have everything catalogued but all have some catalogued. However, five have no insects catalogued. Over half of these Group 7 museums take over one year before newly acquired specimens are catalogued. This is explained by inadequate staffing levels at the most active museums.

(It is interesting to note here that the conditions for Registration of Museums will require a definite commitment towards cataloguing the backlog.)

## Curation, caretaking and storage

### Curation

In the majority (over 90%) of institutions the curators spend less than one third of their time on curation. Museums reporting no curation were predominantly in Groups 1 and 2 with one in Group 3 and one in Group 5 (due to frozen post). Six more collections receiving no curatorial care are in university museums or similar institutions. Five of these six institutions are still receiving new material! Even though their existing collections are at risk they still acquire more!

One quarter of museums with biological collections use volunteers to help with curation. In ten institutions all curation of insects is carried out by volunteers. In eleven institutions, voluntary staff carry out all biological curation.

The report points out that where curation of natural history collections by non-qualified staff occurs, damage to the collections ensues.

### Expansion space

Details are given concerning curation being impeded by lack of room for expansion. This is a frequent occurrence.

### Accessions register

Forty institutions have no accessions register. All are Groups 1 to 4 except two university departments in Group 6. They are all failing to conform to professional standards as laid down by the Museums Assocation. (This will cause them severe problems when attempting to register as museums.)

### The backlog

The report includes tables showing the percentages of unaccessioned material in museums of each group. Over one third of Group 5, 6 or 7 museums have major accessioning backlogs.

### Storage

Inaccessibility of collections is discussed and inadequate storage units are reported as a major problem. Twenty-four of the 49 Group 6 and 7 museums do not have a large enough storage area considering their role as major centres of museum natural history.

The working party considered that a minimum of 10% expansion room should be available in dry stores. Over half of the Group 7 and nearly half of the Group 6 museums **could not meet these criteria!** In each group 10 museums had **NO** space left at all.

Two Group 6 and one Group 5 museum reported the most acute problems. These are Southend, Passmore Edwards and Hereford City Museums.

## Facilities and resources

Access to fumigation chambers, freeze driers, deep freezes and cold stores is discussed. It is pointed out that if none of these four items is available then a museum has no way to treat incoming specimens efficiently.

Access to a fume cupboard is vital to comply with Health and Safety legislation when handling many everyday chemicals. One third of Group 6 and 7 museums do not have access to one.

Widespread inadequacies concerning lighting, ventilation and water and power supplies in stores, offices and laboratories is noted. Group 6 and 7 museums tend to be the better off, but many still have major problems.

### Libraries

Only 13 museum natural history libraries have a fixed annual budget of over £500. Tables are included showing library facilities on a regional basis. The main fact to emerge is that many museums are unable to maintain the size of library needed for their collections.

### Microscopes

The provision of microscopes is worst in Group 1 museums and best in Group 6/7 museums. Absence of a microscope will obviously preclude work or research on many collections.

## Loss of collections

Two thirds report some collections have been lost through neglect and one quarter report losses due to unforeseen disaster. The report points out that the museums losing specimens through neglect are not fulfilling the most important function of a museum - to safeguard material for posterity.

Eighty per cent of institutions with natural history curators report losses of collections or specimens through neglect. The main reasons for damage by neglect were reported as (in descending order of importance):

1. **Bad storage**
2. **Neglect, bad curation, bad handling**
3. **Pest attack**
4. **Absence of qualified curators**

A depressing appendix lists reasons given for loss of collections or specimens. Below are a few details:

Lost through neglect (126 occurrences)

Ex-curator used to hold auctions

Informal, undocumented exchange went ahead in the past

Dumping of 'excess' horns and antlers in 1930s

1977, insects and birds eggs destroyed through insecure external stores entered by children (hole in roof)

Unofficial gifts and exchanges

Material has left museum by unspecified means for unspecified reasons

Some material thrown away by previous curator. No details of losses available

Disposal of some specimens by bonfire, 1950s

At risk. Council considering sale of 'surplus' specimens to finance institution

Much late 19th and 20th century material has vanished without trace

Prior to 1970 many other museums and private individuals were allowed to 'help themselves'

1960-69 unofficial gifts and sales by caretaker

Collections disposed of by bonfire in early 1960s as surplus to requirements

### Fumigants

The lack of a safe, effective pest-control strategy is mentioned and concern is expressed about the effects of regular and long-term exposure of staff to naphthalene, paradichlorobenzene, dichlorvos and mercuric chloride.

### Security against fire and theft

Only 15% of institutions reported inadequate theft precautions but 59% reported losses due to theft. Sixty per cent reported inadequate fire protection for their stores. Forty-one per cent of Group 7 museums have inadequate fire protection in their stores! This obviously includes massive numbers of specimens and many types.

### Collection maintenance

Among the Group 6 and 7 museums there are an estimated 2 million specimens in bad condition (ie on the brink of destruction). Approximately 7 million more are in indifferent condition. However, when visiting institutions the survey investigator found that nearly all curators had underestimated their problems!

## Use of collections

Details are given of the use of collections by staff for research, display and loans and by visitors and researchers. Areas of concern include large numbers of institutions that are not used by researchers at all. Groups 1 to 3 and 5 are the worst in these respects.

Many museums with no natural history curator have biological displays. The selection of items suitable for display is an obvious concern.

## Suitable repositories

In response to the question 'Is the museum able and willing to be a repository for collections from universities and research institutes?', 77 replied 'Yes'. However 31 of these museums had no full-time natural history curator!? Of 25 Group 7 museums answering 'Yes' the working party considered that only 10 were really able to take such collections. Institutions causing them most concern are the Hope Entomological Collections (University Museum, Oxford), Manchester Museum, Merseyside County Museums, Castle Museum (Norwich) and Glasgow Art Gallery and Museum. Appendix XXVIII lists museums which said they were suitable but which the working party considers unsuitable - reasons are given.

Most museums were happy for a BCG representative to visit (4 refused). It was interesting to note that 85% of museums said they would welcome professional assistance from outside. This included many Group 6 and 7 museums.

## Policies

### Closure

The number of museums with formal arrangements for the collections if they were to close is very low. This includes 37 Group 6/7 museums.

### Frozen posts

Forty museums reported frozen natural history posts and 34 had had posts removed in the last 5 years (to 1984).

### Collection policies

Less than half of the institutions had collecting policies and of the 108 that did only 47 had them written down.

### Code of practice for curators

Only 17% had formal guidelines for natural history staff. Only 6% had written guidelines! The working party regards the adoption of the MA Code of Conduct for Museum Curators by museums as an essential requirement for high standards of professional conduct.

### Curatorial representation on committees

Curators do not attend policy meetings in most museums. The report gives examples of inefficient informal consultation arrangements and expresses concern that many museum curators do not have direct access to their trustees or committee.

### Disposal of collections

Seventy-one per cent of institutions had no collection disposal policy! Even in Group 6 and 7 museums 43% had no disposal policy! Statistics concerning widespread disposal by gift, sale or exchange are listed. Unethical disposal is usually associated with the absence of a full-time natural history curator.

## Summary

Under a chapter entitled 'Curators' Professional Milieu' the fundamental problems are summarised:

1. **Lack of essential resources (staff, equipment, library etc.)**
2. **Lack of space or inaccessibility of collections**
3. **Poor collection documentation**
4. **Poor communication and consultation (ie management problems)**

Five named museums have their problems listed (Manchester, Bolton, Sheffield, Birmingham and Hampshire) as do three un-named museums, all with problems caused by poor communication and consultation.

Other activities can adversely affect curation. Biological recording and display are the main causes and are a major problem in some museums where they receive overriding priority.

## Appendices to the report

Many have already been mentioned but one that has not is the 'Black Mark' table. This lists museums in Groups 5 to 7 in 'Black Mark Order'. Black Marks are related to poor storage or documentation, lack of expansion space, poor access for research and curation, poor library provision and lack of important equipment.

## Recommendations from the report

### Recommendation 1

Peripatetic biology curators should be appointed to Area Museum Councils to offer advice and help with the care of biological collections and, where necessary, to curate them.

Each AMC should appoint at least one full-time peripatetic biology curator and the larger councils, such as the Scottish Museum Council and the Area Museum Service for South Eastern England should appoint not less than two curators. These curators should be appointed on 3 year contracts with the possibility of renewal following a review of the situation in museum natural history towards the end of the initial 3 year period. The peripatetic curators' work should be supervised by the Natural History Advisory Panels already established or yet to be established in the areas covered by AMC's in the United Kingdom.

### Recommendation 2

The major museums identified as actual or potential centres of excellence in natural history should act as parent museums to the peripatetic biology curators.

The parent museums should be able to provide back up facilities for peripatetic curators and funds should be allocated from the AMC's to ensure that these museums are able to fulfil their responsibility.

**Recommendation 3**

Provision should be made in parent museums for the reception and storage of valuable and important biological collections discovered by peripatetic curators to be beyond the capacity of their custodians to conserve and curate. Parent museums must be given the wherewithal to provide space, modern storage units and the curatorial staff that this will require.

Although parent museums may be designated to take into their care biological collections under threat, the option remains of leaving collections where they are, provided means can be found properly to store and curate them on a long term basis. Decisions on whether a collection should be transferred to a designated museum will be based on the advice of the peripatetic biology curator and the Natural History Advisory Panels. Existing museums with commitment to local, regional natural history should be supported to improve accessibility of collections and support services.

**Recommendation 4**

New or additional conservation facilities consisting of a laboratory and a staff of properly trained conservation technicians should be established in the parent museums or in other central institutions including Area Museum Councils.

The conservation laboratories would attend to the great burden of conservation work already identified in broad terms and to which the peripatetic biology curators will address themselves. Staff with systematic expertise should be trained in relevant conservation techniques to deal with a wide range of biological material and its conservation. The Working Party endorses the view of Foster (1980) that natural history collections generally should be conserved by qualified scientists, with graduate curatorial staff being assisted by natural history technicians.

The new staff will supplement the work of preparators and taxidermists already in post and they may be AMC, museum or university personnel as best befits local and regional circumstances.

**Recommendation 5**

Area Museum Councils and the Museums Association should approach the Museums and Galleries Commission for funding derived ultimately from the Office of Arts and Libraries to support the appointment of the peripatetic biology curators and the formation of new conservation facilities as outlined in Recommendation 4.

Parent museums which are to receive and curate important collections from other museums (Recommendation 3) should be funded in the same way. However, some contribution from the parent museums' own controlling authorities, whether the museums be national or local authority institutions, should be forthcoming to bring the parent museums up to a satisfactory standard. Where important collections have been built up as a result of scientific research, the research councils should be approached for financial support. In some cases, sponsorship may be appropriate to support the care of important collections.

The pressure for financial assistance should be applied in the first instance by the Natural History Advisory Panels. This underlines the necessity that these panels should comprise senior and very senior professional and institutional members.

**Recommendation 6**

It is recommended that a catalogue of Biological Collections Advisory and Rescue Services (BIOCARS) be compiled by the Museums Association in conjunction with the relevant learned societies. A Secretariat should be established to consult with interested bodies and to make the compilation on which to base the catalogue.

Museums and learned societies have a reservoir of expertise and resources capable of being utilized to answer a wide range of questions and to provide co-ordinated services to other museums, governmental bodies and commercial organisations. The BIOCARS scheme would provide services paid for by clients, thus allowing museums to supplement their income.

**Recommendation 7**

The Museums Association, the Museums and Galleries Commission and the Research Councils should establish a steering group to co-ordinate and monitor action on the recommendations delineated here. This steering group should be responsible for recommending new action in response to changing circumstances.

The Working Party believes that long term co-ordination between the Museums and Galleries Commission and the Research Councils is an essential prerequisite to more efficient management and use of biological collections. Therefore, we recommend that the new steering group should make long term plans to ensure a continuation of its co-operative approach to the management of biological collections in the U.K.

# Oldham Museum : the natural history collections

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## Introduction

This paper is a condensed version of a report produced by the author for Oldham Metropolitan Borough Council whilst he was employed as Temporary Keeper of Natural History between 26th October 1987 and 26th February 1988.

**Objectives**

(i) To report on the condition of the collections, detailing their conservation, storage and documentation needs.

(ii) To assess the importance of the collections, on a national, regional and local level, by criteria such as numbers, age, rarity of species and significance of the collectors.

(iii) To set down guidelines for the future care and use of the collections.

The aim of this paper is to outline the size, condition and significance of the collections held by Oldham Museum. It also includes information on collectors, dates and localities which will be of use to future users of the collections and may be of help to staff carrying out collection research in other institutions.

**Method**

The first stage was to identify all the taxonomic groups represented in the collections. The following information was then extracted: storage location; number of species; number of specimens; collectors; localities; dates; unidentified specimens; condition; rarity/importance of the specimens.

This is essentially the information included in this paper, although the original report also contained more details of storage and conservation requirements, curation requirements, display potential and suggestions for the development of a collections policy, as well as the potential uses for the collections in both education and research.

## An historical review of the natural history collections

The earliest record of a natural history collection in Oldham is that of a society of botanists mentioned by Holt (1795) as 'established about twenty years ago, begun originally by Dr Haulkyard, George Hyde and John Newton. The society meets nine months in the year and each member contributes six pence a month (the present members are all artificers), two pence of which is reserved for the purchase of books, and the remaining four pence on liquor. They have purched by this means about twenty volumes, and are possessed of 1,500 specimens of plants, properly classed'. This was probably the society formed at Royton with John Mellow as president.

There were a number of informal natural history groups around Oldham in the nineteenth century ( L. N. Kidd pers. comm.) and the Oldham Microscopical Society,

established by John Waddington and John Radcliffe amongst others in 1864, formed one of the country's earliest microscopical societies. They established a 'Circulating Cabinet of Microscopic Objects' which was exchanged between members with a week for each to examine the contents. The name was adopted in a meeting at 2 High Street on 7th September 1867, and the first formal paper was read in the Club Room of the Lyceum on 13th February 1868 by Mr Pullinger on 'The Microscope and its uses to the Naturalist'. The audience included members of the newly formed Field Naturalists' Society, but this society was short lived and the two societies soon merged to become the Oldham Microscopical Society and Field Club.

In the 1880s, Dr James Yates, a Mayor of Oldham, established a municipal free library in the town and also encouraged the formation of the Museum and Art Gallery. He donated the sum of £1,000 in a bequest for providing better accommodation in the Museum for specimens of natural history and for promoting the study thereof (Kidd, 1977). Thomas H. Hand was the Curator of Oldham Art Gallery and Museum at the end of the nineteenth century and produced a report giving 'Suggestions on the Development of a Museum for Oldham'. He obtained the help of Herbert Bolton (Assistant Keeper at Manchester Museum) to produce a detailed report in 1896 on displaying the geology collection. Bolton planned and rearranged the geology galleries, finishing the work in 1898. The Oldham Natural History Society was formed in 1905, based on the Museum, and many of the society's collections became incorporated into the Museum's collections.

Fred J. Stubbs was Deputy Librarian and Assistant Curator of the Oldham Municipal Library and Museum between 1919 and 1932 after coming from Stepney Museum. He had a wide knowledge of natural history, publishing many papers, and was a good taxidermist, acquiring many notable specimens for the Museum. His 'Nature Notes' were published in the *Oldham Chronicle* and later continued by John Armitage. Armitage, along with Molly Weaver and Fred Taylor, provided much assistance at the Museum and many of the present labels with the bird specimens probably still date from this period. Many of the birds in natural settings, formerly in Oldham Museum, were the joint work of Taylor and Stubbs, while Taylor cleaned and arranged the specimens before they were moved to Werneth Park.

In about 1935, all the collections were transferred to the Werneth Park Study Centre and Leonard N. Kidd became Keeper in April 1948. The Oldham Natural History Society moved to Werneth Park in 1951 and were soon joined by the Oldham Microscopical Society and Field Club in 1959. The two societies held meetings on alternate weeks, but soon merged and the name was officially changed to the Oldham Microscopical and Natural History Society in 1968. For many years these societies have assisted the museum in the collection of material and the compilation of records of the local flora and fauna. The present society is still active today, holding weekly meetings, and indeed the present condition of the collections owes much to the concern of certain members. The geological display was redesigned by Dr R. M. C. Eagar and A. Frost between September 1954 and April 1957. Leonard Kidd, a good entomologist with a particular interest in Diptera, was responsible for building up the insect collections and filling many of the gaps. He helped to produce the *Royal Entomological Society Handbook on Mycetophilidae* (Hutson, Ackland and Kidd, 1980) although his specimens of this group are not in the museum collection. It was his initiative which led to the fieldwork and subsequent publication of one of the first in the recent trend of intensive site studies (Kidd and Fitton, 1971).

The natural history collections were removed from Werneth Park in January 1976 and placed in their present position: the picture store beneath the Central Library. Leonard Kidd took early retirement in March 1981, when the post of Keeper was frozen. No further work took place until the appointment of the author as Temporary Keeper between 26th October 1987 and 26th February 1988. After a gap of a year it seems likely that two new posts, a curatorial and an exhibitions post, will receive ratification by the Council (A. McEvoy pers. comm.).

## The collections

### Botany

#### *Fungi*

The collection contains only 18 species of dried fungi plus four unidentified specimens. In addition there are 59 plaster models of fungi purchased from Flatters and Garnett (Manchester) in 1923; 31 species are represented.

53 species; 81 specimens.

#### *Plantae*

The herbarium is largely composed of the Squire Ashton collection. This comprises eight wooden boxes containing 491 species of seeding plants and 14 boxes containing 528 species of mosses. The collection dates from 1827-1897 and contains British material with many specimens of local origin as Ashton lived in Oldham.

Other botanical specimens include 30 display boxes showing the flowers, leaves, fruit and timber from British trees. These were purchased from Flatters and Garnett along with models representing the greatly enlarged flowers of 37 species of plants, made by Deyrolles in Paris. There are also 12 tubes of wheat grain from different parts of the world.

At the time of writing the retrieval of particular species is difficult because of the method of storage and the outdated nomenclature and taxonomic order.

Oldham Microscopical and Natural History Society hold a much larger herbarium containing 85% of the British species. The specimens include seeding plants, ferns, mosses, algae, seaweeds and fungi contained in two cabinets and 16 large store boxes in the boiler room of Werneth Park Study Centre. It is largely composed of specimens from J. R. Byron (collection dates: 1870-1897), J. Nield (1825-1885) amd J. H. Whitehead (1833-1896), three local botanists who travelled widely. There are also notable recent additions from L. N. Kidd, Rev. C. E. Shaw et al. Over a quarter of the specimens are from Oldham and another third from the rest of north-west England and so it is of great local significance. The Society are keen to see the collection move to a location where it would receive better curation and storage conditions and be more accessible for reference.

1,062 species; c.1,160 specimens.

### Invertebrates

#### *Cnidaria*

The collection contains 21 unidentified specimens of coral.

***Mollusca***

There are over 12,000 specimens in the collection; at least 302 British and 1,709 Foreign species are represented. The specimens come from at least 14 donors, the major ones being Fred Taylor (Oldham), William Moss (Ashton-under-Lyne) and Lilian Bates (Oldham). The majority of the specimens come from Taylor, who published several articles, including *The Land and Freshwater Mollusca of the District between Ashton-under-Lyne and Oldham* in 1897. Most of his specimens are local but some are from other areas of Britain and abroad, including at least 127 specimens from Lifu. *Paludestrina taylori* E. A. Smith, 1901 was named after him, although it is now recognised as a synonym of *Bythinella scholtzi* (Schmidt). The William Moss Collection was given by his wife in 1914 and also contains British and Foreign land and freshwater shells. These collections have been combined with specimens from other collectors, but unfortunately many specimens have no labels to indicate which collection they are from. The exception is the Lilian Bates collection of mainly British specimens which are still in the donor's cabinet. At the time of writing the mollusc collection is split up with parts of it in five different cabinets. There are several boxes containing over 500 unsorted and unidentified specimens.

British 302 species; c.6,675 specimens.

Foreign c.1,709 species; c.5,329 specimens.

***Diploda and Chilopoda***

The collection contains 36 tubes of 21 species preserved in alcohol with glycerine, mostly originating from the Oldham area.

21 species; 36 specimens.

***Isopoda***

The collection contains at least six species preserved in alcohol with glycerine.

6 species; 8 specimens.

***Solifugae***

The collection contains a specimen of *Galeodes arabs* from North Africa.

1 species; 1 specimen.

***Pseudoscorpionidae***

There are four local unidentified specimens in the collection. Two are carded specimens and two preserved in alcohol with glycerine.

2 species; 4 specimens.

***Opiliones and Araneae***

The collection comprises 218 specimens of 155 British species preserved in alcohol with glycerine. Most were collected in Oldham by M. G. Fitton, L. N. Kidd et al. There are also at least 16 specimens of foreign spiders, including several large specimens imported with fruit consignments, some of which are preserved in spirit and some dried.

175 species; 227 specimens.

***Acari***

The collection comprises five tubes containing at least three species brought in as enquiries by the Environmental Health Department.

3 species; 5 specimens.

***Merostomata***

There is one specimen present in the collection.

1 species; 1 specimen.

**Insects**

***Thysanura***

One specimen preserved in alcohol with glycerine.

1 species; 1 specimen.

***Ephemeroptera***

There are 16 specimens of six species in the collection plus a further three awaiting identification. They are mainly local, originating from A. Brindle and L. N. Kidd in the 1950's and 60's.

6 species; 19 specimens.

***Odonata***

The museum has 118 specimens but these are largely unidentified and scattered throughout various store boxes and cabinet drawers in no systematic order. The bulk of the collection was purchased from J. Arkle (Chester) in 1925 and dates back to 1893. The specimens mainly come from the south of England but include some from Northern Ireland as well as some North American species. The small number of recent local additions were made by L. N. Kidd and J. Millward.

c.37 species; 118 specimens.

***Plecoptera***

The collection contains 14 of the 32 British species, totalling 75 specimens, with a further 11 still unidentified.

14 species; 86 specimens.

***Orthoptera***

There are 41 specimens of 14 British species and 18 specimens of at least 12 foreign species in the collection. There are examples of local species but many of the specimens are from southern England. Most of the cockroaches were brought in as enquiries by the Environmental Health Department.

26 species; 59 specimens.

***Dermaptera***

Fourteen specimens are in the collection, including at least one unidentified foreign species.

3 species; 14 specimens.

***Psocoptera***

There are two unidentified specimens preserved in alcohol with glycerine.

2 species; 2 specimens.

***Anopleura***

The collection contains ten specimens of three species brought in by the Environmental Health Department and preserved in alcohol with glycerine.

3 species; 10 specimens.

***Hemiptera***

Four hundred and forty-five specimens of 128 species are present in the collections. They are mostly local, originating from M. G. Fitton, L. N. Kidd and 10 other collectors between 1940 and 1971. There are a further 84 specimens not yet identified, including a few foreign species. The only notable species identified is *Capsus wagneri* which is classified as 'rare' or R.D.B.3 (N.C.C., 1986). There is also an enlarged model of the aphid *Syphonophora rosae.*

135 species; 533 specimens.

***Neuroptera***

Sixteen species, comprising 40 specimens, are represented in the collection. Most were collected locally since 1943, by A. Brindle, S. Charlson, W. D. Hincks and L. N. Kidd.

16 species; 40 specimens.

***Mecoptera***

The collection contains eight specimens of two out of the four British species, collected by M. G. Fitton, W. D. Hincks and L. N. Kidd.

2 species; 8 specimens.

***Lepidoptera***

The main British collection, containing 13,579 specimens of 1,622 species (74% of the British list), is housed in four cabinets but there are a further 19 store boxes containing specimens labelled as 'duplicate' species, although many of these have data and include specimens from different localities and collectors. In addition, there is a cabinet containing 5,064 specimens of the R. Cottam Collection.

The main collection contains material from at least 118 collectors of which the following are the major contributors: F. Bond, A. W. Boyd, S. Charlson, C. Johnson, L. N. Kidd, W. Mansbridge, H. N. Michaelis, R. B. Robertson, W. P. Stocks and A. E. Wright. There are many nineteenth century specimens with some dating back as far as 1815. Only about 8% are from Oldham Metropolitan Borough, but 50% originate from north-east England (excluding Oldham), especially from Lancashire, Cheshire and Westmorland. The remaining 42% are from various parts of Britain, including Wales and Scotland. The vast majority have attached data labels. The collection contains a number of larvae and pupae mostly bought, along with a few adults, to fill gaps, from the entomological dealers Watkins and Doncaster (then in London) and W. H. Harwood and Son (Sudbury). The taxonomic order is now outdated, although not as much as that of the Cottam Collection.

The R. Cottam Collection contains material from at least 28 other collectors but most originate from Cottam (Wilmslow) and his associate J. Taylor. On his request the collection was presented to Oldham by his wife in 1962. The specimens date back to 1845, virtually all being pre-1914, and although they were taken in at least 34 British counties many come from Lancashire and Cheshire, including specimens from Oldham. Most specimens have data with them and some larvae are included in the collections. This is an important local collection and would be best kept as a separate collection, although species additional to the main collection are present.

The 'duplicate' collection contains generally, but not entirely, inferior specimens, i.e. some badly set, some damaged or worn and many lacking data. At least six additional collectors have material represented and those specimens with data should all be regarded as unique, whatever the condition.

The main collection contains an impressive 57 specimens of 18 species now extinct in Britain. Three of these are of continental origin and some lack any data, but at least a third have information proving they were taken in Britain. There are also 208 specimens of 35 'endangered' (R.D.B.1) species of which 45% have data. Because of the outdated nomenclature the examination of the Cottam Collection has not been exhaustive, but it contains at least eight 'extinct' species (33 specimens) and six 'endangered' species (32 specimens). These are not additional species to the main collection except for one notable exception - three specimens of The Many-lined (*Castaconvexa polygrammata*), which has not been recorded in Britain since 1875 (N.C.C., 1987) and the specimens were taken at Wicken Fen in 1870. A total of at least 172 'extinct' or Red Data Book species are represented in the collections (see Table 1).

The foreign Lepidoptera include 2,267 specimens of well over 205 species, but many await identification. This would be a major task, but with the number of specimens involved and their age, some dating back to at least 1897, there may well be rare species involved. There are two major contributions:

(i) a cabinet and five store boxes comprising the M. H. Millward Collection, presented in 1955. The specimens originate from India, Japan, China and Brazil between 1919 and 1938;

(ii) 430 specimens of the R. Cottom Collection given in 1910 are from North America, South America, Asia and Africa.

At least 34 other collectors have specimens represented from over 30 different countries in 34 store boxes.

British 1,628 species; 26,335 specimens.

Foreign 205+ species; 2,267 specimens.

***Trichoptera***

The collection of identified specimens is contained in six drawers of a Hill cabinet. It comprises 244 specimens of 78 species whilst a further 72 specimens can be found elsewhere awaiting identification. The specimens have been collected by six entomologists - A. Brindle, D. Bryce, S. Charlson, W. D. Hincks, L. N. Kidd and P. Skidmore. All the specimens have full data and include one 'endangered' (R.D.B.1) species *Hagenella clathrata* and one 'rare' (R.D.B.3) species *Triaenodes reuteri*.

78 species; 316 specimens.

***Diptera***

The main collection is made up of 943 species totalling 3,779 specimens housed in four cabinets and 11 store boxes. There are also 693 unidentified British specimens and 47 unidentified foreign specimens. All the above are pinned or carded specimens but, in addition, there are seven tubes of Psychodidae preserved in alcohol with glycerine.

| | Extinct | RDB1 | RDB2 | RDB3 | RDB4 | RDB5 | Na | N | Nb | Nr |
|---|---|---|---|---|---|---|---|---|---|---|
| Hemiptera | | | | 1 | | | | | 1 | 1 |
| Neuroptera | | | | | | | | | 1 | 1 |
| Lepidoptera | 19 | 35 | 30 | 75 | 2 | 1 | 65 | | 224 | 19 |
| Trichoptera | | 1 | | 1 | | | | | | |
| Diptera | | 4 | 7 | 30 | | | | 152 | | 34 |
| Coleoptera | 3 | 29 | 26 | 53 | | | 176 | | 387 | 1 |
| Total | 22 | 69 | 63 | 160 | 2 | 1 | 241 | 152 | 613 | 56 |
| | | 295 | | | | | 1062 | | | |

Table 1. Insecta: extinct, red data book and notable species in the collections (N.C.C., 1986)

The main collectors represented are A. Brindle, H. Britten, L. N. Kidd, L. Parmenter, P. Skidmore, J. D. Ward and A. E. Wright and most specimens originate from north-west England. Most local specimens were collected by L. N. Kidd, the previous Keeper of Natural History, who specialised in certain Diptera groups and carried out an intensive study of Holden Clough (Kidd and Fitton, 1971). The specimens from L. Parmenter, mainly larger Brachycera, are all species from south-east England which are rare or absent from the Oldham area. The A. E. Wright Collection of Syrphidae (hoverflies) and Conopidae is nationally important and his other entomological collections are held by major museums including Liverpool. He published the results of his work as a *List of Syrphidae of North Lancashire and South Westmorland* (Wright, 1940) and *Some Uncommon Syrphidae from North Lancashire and South Westmorland* (Wright, 1944). The museum posssesses reprints of these with additions in his own handwriting. The cabinet containing 1,907 specimens incorporates the collection of his associate. J. D. Ward. A further 31 dipterists have provided British material dating back to 1918. Some specimens have the determination labels of national experts J. E. Collin and E. C. M. Fonseca.

The collection contains eight specimens of four 'endangered' (R.D.B.1) species plus seven 'vulnerable' (R.D.B.2) species and 30 'rare' (R.D.B.3) species.

At least nine collectors have provided foreign material, mainly Indian Tipulidae (craneflies) from P. Susair Nathan and Scandinavian and North American Sciomyzidae (snail-killing flies) from several collectors. There are also models of the egg, larval, pupal and adult stages of the Housefly *Musca domestica.*

British 950 species; 6,218 specimens.

Foreign c.40 species; 55 specimens.

***Siphonaptera***

Of the 47 British species only four are represented in the museum collection in a total of 12 tubes. They are preserved in alcohol with glycerine.

4 species; 12 specimens.

***Hymenoptera***

There are 665 specimens in the collection from at least 137 British species, but there are just two foreign specimens. In addition there are examples of a wasps' nest and a bees' nest with bee specimens. They are housed in four store boxes with some Parasitica found in the Lepidoptera collections. The specimens originate from at least nine collectors and most were taken locally.

139 species; 668 specimens.

***Coleoptera***

The main collection, in three large cabinets, is made up of 9,427 British specimens representing 2,016 species. 'Duplicate' species in store boxes, although most have unique data, add at least another 226 specimens and unidentified specimens another 679. The only examples of Coleoptera larvae are three preserved in alcohol with glycerine.

A third of the collection is composed of the important C. G. Hall Collection, comprising over 7,000 specimens all pre-dating 1890. Hall lived in London, Deal and Dover and collected actively in south-east England. The collection also contains many specimens of his contemporaries, i.e. 60 collectors including Dr G. R. Crotch, Rev. W. W. Fowler (Lincoln), H. Harding, A. C. Homer (Tonbridge), E. W. Janson, J. H. A. Jenner, E. A. Newbury, Dr J. Scott, F. Smith and J. J. Walker. These were all well-known coleopterists of their day and the specimens date back at least to 1841. The Rev. W. W. Fowler published the major six volume publication *The Coleoptera of the British Isles* in 1887, the standard work on Coleoptera for many years. At least 136 of Fowler's specimens are in the collection as he regularly exchanged specimens with Hall. A detailed notebook in Hall's handwriting accompanies the collection and contains most of the information, i.e. numbered labels attached to the specimens, refer to the numbers in the notebook. The Hall Collection in two twelve-drawer cabinets was purchased by Oldham Museum in 1924 for £50.

The other collectors with most specimens in the collection are J. E. Cope (dates span the period 1874-1943), T. E. Fowden (1950s and 1960s), L. N. Kidd (1948-1978) and C. Johnson (1960s). The vast majority of these specimens are from Lancashire, Cheshire and Derbyshire, including many from Oldham Metropolitan Borough. Another 30 people have contributed specimens which date from 1930-1980, mostly from the local area. A high proportion of the specimens have full data but, unfortunately, many from the Cope Collection lack such details. Four per cent are from Oldham, 16% from north-west England (excluding Oldham) and 80% from the rest of Britain.

Thirteen specimens of three extinct British species are represented in the collection but, regrettably, none has locality data. Amongst 108 Red Data Book species are 65 specimens of 29 'endangered' (R.D.B.1) species of which 48% have locality data.

The foreign Coleoptera include 2,705 specimens of at least 749 species, but many remain unidentified. At least 19 collectors have foreign specimens in the collection, notably B. D. Cooke, J. R. Dibb, W. D. Hincks, P. S. Nathan and W. H. Millward. They are from most continents, with a particularly good range of species from Australia, West Africe, India and Europe.

British 2,038 species; 10,345 specimens.

Foreign 749+ species; 2,705 specimens.

***Condition of the collection and its requirements***

There has been no infestation of the insect collections but there is damage to some specimens through too close packing in store boxes, notably amongst the foreign Lepidoptera. Some carded Orthoptera and Coleoptera specimens have been detached from their mounts and required regumming; verdigris has attacked some pins. The insect collections are in good condition overall considering the recent lack of curation.

There are still over 4,100 specimens awaiting identification and amalgamation into the collections. The Odonata and Hymenoptera require cabinet storage and arrangement in taxonomic order. Other collections also require revision of the taxonomic status and order of species.

**Vertebrates**

***Osteichthyes***

There are no spirit-preserved specimens but 105 casts of 66 species of fish. The casts, some on plaques, form part of the A. J. Gear Collection, bought via E. Gerrard and Son (London) in 1932. Gear lived at Westcliffe, Essex and P. W. Horn, an associate of Gear, described him as 'the premier fish modeller, and his work is in all the national museums'. There are also casts from Horn (Stepney Museum) and Flatters and Garnett (Manchester) in the collection. Sixteen cases, comprising 20 specimens, form part of the bequest by the Oldham Central Angling Club, including a 37.75lb pike. An additional three cases from the bequest are still at Werneth Park. A further eight donors have provided cast specimens.

67 species; 14 specimens.

***Amphibia and Reptilia***

The collection contains nine plaster casts, probably all by P. W. Horn, except for an Adder by F. H. L. Whish (Somerset). There are also two dried specimens, ten preserved in spirit (of which at least two have been spoilt by evaporation) two cast snake skins and a skeleton of a Common Frog. In addition there are 24 models showing the 'development of the Frog', which were purchased from E. Gerrard and Son (London).

***Aves***

*Mounts and skins*

There are 849 specimens of 321 species represented in the collection. These are mainly mounts, but also included are 30 study skins. The collection contains at least 125 foreign species while about 83% of the species regularly breeding in Britain are represented. At least 20% of the specimens originate from the Oldham area.

The birds come from a large number of collections and donors, often a single case or specimen was given, but the following donors presented a significant number of specimens: N. Abbot (Wilmslow), B. Clegg (Oldham), W. Daws (Mansfield), S. Duncan (Hull), J. Platt Hall (Ashton-under-Lyne), Capt. G. A. Schofield (Harrogate), F. J. Stubbs (Oldham), F. Taylor (Oldham), Mrs H. Taylor (Oldham) and Mrs Wrigley (Oldham).

A good number of specimens were also purchased from W. F. H. Rosenberg (Naturalist and Importer of Zoological Collections, London) and F. H. L. Whish (Naturalist and Taxidermist, Lympsham, Somerset). Most have some accompanying data, although this is not always complete and is often scattered through several sources. They are stored in display cases, cabinets and boxes with 11 specimens on display in the 'Moorland Life' case in the library. Amongst the mounts are the following notable species:

*Local specimens from the Oldham area* - Red-necked Grebe, Gannet, Bewick's Swan, Honey Buzzard, Hobby, Arctic Skua, Little Auk and Nightingale.

*British specimens (excluding the Oldham area)* - Bulwer's Petrel, Leach's Petrel, Bittern (2), Long-tailed Duck (4), Rough-legged Buzzard, Golden Eagle (3), Capercaillie (2), Great Bustard (2), Stone Curlew, Grey Phalarope, Pomarine Skua, Pallas's Sandgrouse, Wryneck (3) and Chough.

*European specimens (excluding Britain)* - Little Bittern, Glossy Ibis, Red-footed Falcon, Cream-coloured Courser, Long-tailed Skua, Pallas's Sandgrouse, Alpine Accentor, Wallcreeper and Nutcracker.

There are also specimens from other continents, notably North America. Other interesting specimens include a hybrid Red/Black Grouse, several albino and melanistic specimens and an Eider, referred to in several scientific journals early in the century when it was at first considered to be a Pacific Eider (a sub-species not recorded from Europe).

Possibly the most significant specimen is the Bulwer's Petrel, the second to be recorded in Britain; only four have ever been seen, and this represents a previously unpublished record (see Appendix 1). A number of specimens listed in the Accession Book are no longer in the collection.

There are also a small number of skins:

*Study skins* - Red-necked Grebe, Slavonian Grebe, Storm Petrel, Red Kite, Marsh Harrier, Little Crake, Purple Sandpiper, Wilson's Phalarope, Roseate Tern. White's Thrush, Aquatic Warbler, Icterine Warbler, Ruby-crowned Kinglet and Rustic Bunting.

*Eggs, nests and pellets*

The egg collection contains about 6,150 specimens representing about 1,362 clutches from 239 species. The major part of the collection originates from Fred Taylor who lived in Oldham. The bulk of his collection (216 species, 1,075 clutches, 4,835 eggs) is housed in a cabinet designed and built by him and his son. More eggs, including others from Taylor, are contained in small display boxes. Besides collecting his own eggs, he acquired specimens from at least 113 other collectors and details of these, along with full data on most clutches, are meticulously recorded in two large volumes (cabinet specimens only, although the display boxes usually have data written on the base). His collection contains eggs from a large number of scarce species, both British and European, and many from areas where particular species no longer breed. The main feature of the Taylor Collection is the large number of Cuckoo clutches i.e. 193 clutches containing Cuckoo eggs of 54 host species, plus several sub-species. These include a number of surprising host species such as Treecreeper and Snow Bunting.

The eggs from other collectors, at least 14, are stored randomly in display boxes. The other major collectors include Norman Abbot and Henry Hoyle, although eggs from the latter are labelled but apparently 'not reliably'. There are at least 17 species additional to those housed in the Taylor cabinet.

Amongst the eggs in the Taylor Collection are the following notable species:

*British specimens* - Storm Petrel, Leach's Petrel, Garganey, Red Kit, White-tailed Eagle, Hen Harrier, Golden Eagle, Hobby, Peregrine, Quail, Stone Curlew, Kentish Plover, Dotterel, Whimbrel, Greenshank, Red-necked Phalarope, Roseate Tern, Little Tern, Wryneck, Woodlark, Marsh Warbler, Dartford Warbler, Bearded Tit, Crested Tit, Red-backed Shrike, Chough, Hawfinch and Cirl Bunting.

*Foreign specimens* - Slavonian Grebe, Black-necked Grebe, Gadwall, Scaup, Long-tailed Duck, Honey Buzzard, Marsh Harrier, Montagu's Harrier, Rough-legged Buzzard, Osprey, Baillon's Crake, Great Bustard, Avocet, Ruff, Black-tailed Godwit, Green Sandpiper, Wood Sandpiper, Black Tern, Pallas's Sandgrouse, Fieldfare, Redwing, Savi's Warbler, Woodchat Shrike, Brambling and Snow Bunting.

Amongst the other eggs are the following species:

Calandra Lark, Rufous Bush Chat, Cetti's Warbler, Great Grey Shrike, Lesser Grey Shrike, Rose-coloured Starling and Scarlet Grosbeak.

There are also 74 nests originating from F. Taylor and 29 of these contain clutches of eggs. They include the following notable species: Great Reed Warbler, Dartford Warbler, Bearded Tit, Red-backed Shrike and Cirl Bunting.

Also included in the collections are 26 bird pellets, from Barn Owl, Little Owl, Robin, Rook and some unidentified.

***Condition of the collection and its requirements***

The bird specimens are generally in good condition considering their age with only 26% regarded as 'poor'. The specimens date back to 1815 with most having been taken in the nineteenth century. Although many are of historical interest their age is often shown by the unnatural positions in which they are set, so reducing their display potential. There has been no policy to accept recent legally obtained casualties but there is a need for fresh mounts and a larger representative local collection of study skins plus osteological material and other remains.

There is no catalogue of the collections at present so it is difficult to locate quickly all the items from a particular species e.g. mounts, skins, eggs, nests, pellets etc. To document them fully, however, a good deal of detective work needs to be done to gather together all the facts relating to a particular specimen. Many have labels with them but these are usually incomplete and, more significantly, not even attached to the specimens so some may have become mixed. Many specimens have obviously come from 'broken-up' cases but these have often been regrouped into different combinations, probably by F. J. Stubbs, a previous Assistant Curator. Often several specimens of one species have been grouped together on the same base but, unfortunately, any data accompanying them can no longer be assigned with reliability to a particular specimen. With some work it may be possible to resolve these problems by studying available information and comparing taxidermists' styles. There is a variety of scattered data available: on the base of specimens, data labels, accession books, minute book, correspondence file or from literature such as Stubbs' *Birds of the Oldham District*. This really needs gathering together so that all the information on age, sex, plumage, locality, date, collector, donor and taxidermist is combined.

| | | |
|---|---|---|
| Mounts/study skins: | 321 species; | 849 specimens; |
| Eggs: | 239 species; | 6,150 specimens; |
| Nests: | 61 species; | 74 specimens; |
| Pellets: | 4 species; | 26 specimens; |

***Mammalia***

Thirty species of mammals are represented in the collection by a total of 83 specimens. In addition there are a few small mammal skulls and a cow 'fur ball'. At least 12 of the specimens are of local origin and the specimens come from at least 15 different donors

Collectors include: W. H. Doeg (Manchester), J. Platt Hall (Ashton-under-Lyne), F. J. Stubbs (Oldham) and F. H. L. Whish (Lympsham, Somerset). The more interesting British species include: Greater Horseshoe Bat, Polecat and Pine Marten. Unfortunately, some of the specimens have been badly 'bleached' by prolonged exposure to daylight.

| | Species | | Specimens | |
|---|---|---|---|---|
| | British | Foreign | British | Foreign |
| Fungi | 49 | | 81 | |
| Plantae | 1,062 | | 1,160 | |
| Anthozoa | | 15 | | 21 |
| Mollusca | 302 | 1,709 | 6,675 | 5,329 |
| Diplopoda | 11 | | 20 | |
| Chilopoda | 10 | | 16 | |
| Thysanura | 1 | | 1 | |
| Ephemeroptera | 6 | | 19 | |
| Odonata | 37 | | 118 | |
| Plecoptera | 14 | | 86 | |
| Orthoptera | 26 | | 59 | |
| Dermatera | 3 | 1 | 11 | 3 |
| Psocoptera | 2 | | 2 | |
| Anopleura | 3 | | 10 | |
| Hemiptera | 128 | 7 | 529 | 14 |
| Neuroptera | 16 | | 40 | |
| Mecoptera | 2 | | 8 | |
| Lepidoptera | 1,628 | 205 | 26,325 | 2,267 |
| Trichoptera | 78 | | 316 | |
| Diptera | 950 | 40 | 6,218 | 55 |
| Siphonaptera | 4 | | 12 | 668 |
| Hymenoptera | 137 | 2 | 665 | 3 |
| Coleoptera | 2,038 | 749 | 10,345 | 2,705 |
| Isopoda | 6 | | 8 | |
| Solifugae | | 1 | | 1 |
| Pseudoscorpionidae | 2 | | 4 | |
| Opilones and Araneae | 171 | 4 | 222 | 5 |
| Acari | 3 | | 5 | |
| Merostomata | | 1 | | 1 |
| Osteichthyes | 67 | | 114 | |
| Amphibia and Reptilia | 9 | | 48 | |
| Ares | 200 | 135 | 6,750 | 350 |
| Mammalia | 28 | 2 | 81 | 2 |
| | 6,993 | 2,871 | 59,958 | 11,424 |
| | 9,864 | | 71,382 | |

Table 2. Numbers of species and specimens represented in the collections.

**Geology**

The geology collection was not included in the job description for the post of Temporary Keeper because of the short time period available. The following details were extracted from a report by Herbert Bolton (Assistant Keeper at Manchester Museum) in 1896, and information collected by A. C. Howell (Bolton Museum) whilst carrying out research for the North West Collection Research Unit in 1978, and have not been checked.

The original museum collection contained a fair selection of Coal Measure fossils and the nucleus of a collection to illustrate the local geology. This was considerably boosted by the acquisition of the Nield Geology Collection. The latter is of 'considerable importance and contains many specimens of high value and of great interest to geologists', according to Herbert Bolton. Hopefully this still applies today. It is certainly rich in all forms of Coal Measures fossils. With the subsequent addition of other specimens, notably minerals, there appears to be a good series of specimens to illustrate the Oldham and District geological history.

There has been no accessioning system used, although L. N. Kidd has compiled a rough list of specimens, but a proper cataloguing system would be most beneficial.

Storage conditions are inadequate with the specimens stored in polythene bags and, therefore, susceptible to pyrite disease if the humidity is high. Most specimens are stored on top of one another and could suffer damage through attrition.

| | | | | |
|---|---|---|---|---|
| Mineral Specimens | | | 608 | |
| Rock Specimens | | | 82 | |
| Fossils: | Plantae | | 130 | |
| | Protozoa | | 6 | |
| | Parazoa | | 16 | |
| | Coelenterata | - Corals | 52 | |
| | Arthropoda | - Trilobites | 41 | |
| | | - Crustacea | 9 | |
| | | - Others | 17 | |
| | Mollusca | - Gastropods | 229 | |
| | | - lamellibranchs | 285 | |
| | | - Cephalopods | 117 | |
| | Brachiopoda | | 245 | |
| | Bryozoa | | 7 | |
| | Echinodermata | - Echinoids | 55 | |
| | | - Crinoids | 17 | |
| | | - Others | 1 | |
| | Stomochorda | - Graptolites | 8 | |
| | Fish | | 68 | |
| | Reptilia | | 28 | |
| | Other Vertebrates | | 62 | |
| | | Total | 2084 | specimens |

Table 3. Numbers of geological specimens represented in the collections.

**Biological records**

There is a card index system listing local natural history records obtained from publications or by personal communication, but not the collections, and listed according to species. The index is stored in eight rectangular wooden boxes under the following titles:

Local Vertebrates

Local Diptera and Siphonaptera

Local Invertebrata (except Insecta)

Local Lepidoptera

Local Cryptogamic Plants

Local Hymenoptera and Remaining Insect Orders

Local Coleoptera

Within each box there are subdivisions into families and then into species, both stored in alphabetical order. There may be as many as 40,000 individual records; most would benefit from the addition of grid references for contribution to recording schemes (may only be possible to 10km square) and then computerisation so that information on sites, dates, collectors, etc. would be easily accessible.

**Library**

An excellent library of natural history reference books, identification keys and scientific journals has been built up but was removed from the Natural History Department and is now in the basement store of Royton Library. If further work is to be carried out on the natural history collections it is important that these are returned so that they can be used in conjunction with the specimens. There are over 1,250 books and 650 volumes of journals.

**Lantern slides**

There is also a collection of 479 lantern slides, some from life, some from prepared specimens and some from book illustrations. They depict plants, insects, views, birds, amphibians, fish, mammals, local geology, marine invertebrates, trees and reptiles. The photographers include J. Armitage, D. R. Byram, T. Hirst, E. Openshaw and R. Stubbs.

## Summary

**Collections**

(i) The museum possesses large and important collections which cover all aspects of natural history. The size of the collections, i.e. 71,382 specimens, ranks them fifth in the North West Area (behind Liverpool, Manchester, Bolton and Warrington).

(ii) The collections contain a high proportion of specimens from the Oldham area and collected by Oldham naturalists. There are a number of collections of regional, or even national importance, e.g. C. G. Hall Coleoptera Collection; F. Taylor Oology and Conchology Collections; A. E. Wright Syrphidae and Microlepidoptera Collections. The overall high percentage of nineteenth century specimens also increased the collections' significance.

(iii) The majority of the collections have come to the museum through donation. Such donations were prompted by the belief that the museum would act as a safe custodian and would use the collections for the education and enlightenment of future generations.

(iv) It is nigh on impossible to assess the monetary value of the collections, as comparable collections rarely, if ever, come up on the open market. Furthermore recent legislation actively restricts the sale or trade in particular specimens. It is safe to say, however, that the collections are in themselves unique, and consequently irreplaceable; taken in this context they are priceless.

**Curation**

(i) 'Natural history specimens left to themselves will suffer infestation by insects and damage due to humidity changes, and gradually cease to be a problem as they crumble away to dust. Simply ignoring specimens until they are ruined is not an acceptable curatorial choice' (Wheatcroft, 1987). Natural history collections, therefore, require regular inspection and curatorial attention. This has only taken place in recent years because of voluntary assistance, but such help cannot be relied upon indefinitely.

(ii) Documentation is vital to ascertain the complete pedigree of specimens and to show their relationships with collections elsewhere. Ideally, it should be a pre-requisite of any other work and there are also important security and legal implications to be considered.

(iii) Storage and environmental conditions are not ideal. Some collections are overcrowded, causing a certain amount of damage and retrieval difficulties for conservation, documentation and research work. Most specimens require exacting storage conditions because of their shape, size and fragility.

(iv) A certain amount of conservation and restoration work is required on the collections. Complete reorganisation is also necessary for the collections to be of maximum use for reference and if further specimens are to be added. The present storage location of the natural history collections in a comparatively small area of the Art Picture Store effectively precludes rearrangement by taxonomic order. Furthermore, well over 3,000 specimens remain to be identified.

(v) Enquiries to view the egg collection should be refused unless close supervision can be guaranteed, as a number of egg thefts have taken place from museums without permanent natural history staff. Such restrictions should equally apply to other collections, as butterflies and other specimens have also been stolen from museums in recent years.

(vi) As the collections belong to the people of Oldham, there is both an obligation and a desirability to put specimens on display. They should only be used, however, if there is expertise available to advise on their suitability for display. If this is not available, damage may occur to important specimens and some of those loaned out in past years cannot be traced. Furthermore, there are less obvious problems with unsupervised loans, such as old bird specimens which have been treated with arsenic soap and may pose a health hazard.

**Collections policy**

(i) In the past there has been no obvious collections policy and both foreign and British specimens have been readily accepted. However, future acquisitions should be controlled in line with an approved collections policy. This need not be rigid and, indeed, specimens from other parts of Britain can be useful for comparative purposes but, first and foremost, future collection should concentrate on the Oldham Metropolitan Borough. There is great potential for studying local sites and collecting specimens and data from these areas. There is also a great need to help people understand and appreciate the wildlife that can be seen in their local area.

(ii) Data collection should be extended and ideally computerised as this is a logical extension of the information associated with museum specimens on data labels. It can prove invaluable when putting on displays, answering enquiries and producing publications as well as contributing towards conservation issues. In the long term such data should be made available to the national archive, e.g. Biological Records Centre.

**Research**

(i) A large natural history library has been built up over the past hundred years, principally to assist with enquiries and research on the collections. The library thus contains much information which bears a distinct relationship to the collections and should be returned to be used in conjunction with the specimens.

**Recommendations**

(i) That Oldham Museum retains the full range of its natural history collections.

(ii) That a Natural History Department is established with adequate resources to both care for and give wider access to the collections.

(iii) That a collections policy for natural history be adopted to encompass both the future acquisition of specimens and the collection of related data.

(iv) That the natural history library be rehoused alongside the natural history collections.

***Editor's note***

Lists of associated collectors for the insect, bird, bird egg and mammal collections were supplied but have not been reproduced here. They are available from the author on application.

## Acknowledgements

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# Appendix 1

**Details of Bulwer's Petrel**

The Bird Collection contains a specimen of Bulwer's Petrel (*Bulseria bulwerii*) with a label on the base as follows:

'One of two birds that was taken on the fishing boat belonging to John Humphreys, Mousehole.

They was purchased on Sunday and was ordered to be set at liberty by Mr. Baily. One got back to sea but the other was recaptured near Scilly October 2nd 1897'.

The specimen was originally in collection of the late William Daws of Mansfield, Notts (Case No. 141 also containing 3 Storm Petrels and a Leach's Petrel). The case was bought intact from the dealer C. H. Gowland, Naturalist, 'Tadorna', Pensby Road, Barnston, Wirral in 1932 for £3.00.

There are only three confirmed records of this species in Britain: Yorkshire (May 1837, February 1908) and Cork (August 1965) and, therefore, this is a new British record and the second in chronological order. Because of its rarity details of the specimen have been submitted for acceptance by the British Ornithologists' Union and subsequent publication of the record.

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# Book Reviews

**Grasshoppers and allied insects of Great Britain and Ireland** by J. Marshall and C. Haes. Harley Books, Colchester, 1988. Price £25. ISBN 0 946589 13 5.

**A sound guide to the grasshoppers and allied insects of Great Britain and Ireland** by J. Burton. Harley Books, Colchester, 1988. Price £5.75. ISBN 0 946589 22 4.

It is twenty-four years since David Ragge's classic work *Grasshoppers, crickets and cockroaches* appeared in Warne's Wayside and Woodland series. Now long out of print, that volume has become very sought after by entomologists seeking the most comprehensive and up-to-date authority on the orthoptera, dictyoptera and phasmida found in the British Isles. Natural history book collectors have also helped to reduce the number of copies of 'Ragge' on the second-hand market and considerably to inflate its value. Even rarer than the book itself is the record that was issued with it, of the songs and calls of the grasshoppers and crickets.

In this new work Judith Marshall, of the British Museum (Natural History) and Chris Haes, national recorder for the orthoptera, have combined to fill the vacuum created by the scarcity of 'Ragge' and have produced a worthy successor. Although obviously owing a great deal to the previous volume this is by no means just a re-working of it. Following the general format established by Harley Books for their insect publications, there are substantial preliminary chapters covering biology, collection and study, before the detailed descriptions of the species, their life histories and distribution. A large section is given over to habitats and conservation and the fine illustrations (painted by Denys Ovenden) are grouped together at the rear.

The introductory chapters include two sections which immediately catch the eye. These concern the application of scientific names and the pronunciation of them. The principles behind the International Code of Zoological Nomenclature are laid out clearly and precisely, however the advice on pronunciation may be somewhat controversial, at least to those reared on 'anglicised' latin. What is clear is that both sections could (and perhaps should) be placed in the front of any taxonomic text as an excellent guide to those daunted or confused by scientific names.

Chapters on morphology, life-history, development, song, courtship, predators, parasites and disease are good summaries as are those on collecting and rearing. Understandably the orthoptera are concentrated upon, but direction is given for those interested in more exotic groups, for instance the address of the Blattodea Culture Group - a rival 'BCG'!

British orthopteroid insects are, as a general rule, large, relatively easily identified and few in number. Despite this they have never been a popular group to study as they do not make good cabinet specimens. Unfortunately, the section on preservation does not really offer any new ideas on methods of maintaining a life-like appearance. Rapid drying is advocated, but no mention is given as to whether the use of freeze-drying or vacuum desiccation may be of use. 'Pinning' is the only mounting technique discussed, although 'carding' may help prevent physical damage to legs and antennae and spirit preservation may be useful for nymphs and for later examination of soft-parts. My major criticism of this chapter though concerns the advice on killing of the insect. The use of a prepared 'cyanide jar' is mentioned although this technique has long fallen into disrepute for obvious reasons. Regulations on the use of such poisons are very strict, but even if it is still possible to obtain such a jar, I would never advocate its use to a collector. Similarly

more attention could have been paid to other killing agents listed, for example, carbon tetrachloride is a known carcinogen, and not to be recommended lightly.

As an alternative to the preservation of the insects themselves the contributions to the book on photographing and tape-recording of songs are very valuable. Such a shame then that the only photographic studies of the living insects are the few adorning the dust-jacket.

The checklist, keys to species and species descriptions are excellent. In the latter, bold type is used to pick out the most salient descriptive features which is useful. Distribution maps are plotted by vice-county.

A fairly common enquiry to many museums are insects discovered on imported fruit and other goods. These are often grasshoppers, crickets and cockroaches and this source of foreign species is dealt with. Some of the commonest species introduced by this means are illustrated, but it would be far outside the scope of this book to go into this subject in great detail.

The history of the establishment of the British fauna after the ice-age is reproduced virtually word for word from 'Ragge'. Although initially disappointing, it is a testament to the quality of research that went into that previous book. The types of habitat available today, the use of orthoptera as habitat indicators and the problems of their conservation are all discused in detail.

A second set of distribution maps precede the appendices. In this case they represent the results of the Orthoptera Recording Scheme operated by the Biological Records Centre, Monkswood and are plotted by 10km square. The apppendices are exhaustive and include a gazeteer, notes on twenty superlative sites for orthoptera and even Welsh, Scottish and Irish names for certain species.

Despite the appearance of a number of cheaper books in recent years covering some of these groups, e.g. Shires Books, Cambridge Naturalist's Series, Collin's Field Guides, this is without doubt the finest and most comprehensive book on the market concerning British orthopteroids. It will no doubt become a 'classic' and hopefully will stimulate much more interest in the insects, particularly as regards understanding their complex behaviour and biology.

Issued as a companion to the above book is a cassette of grasshopper and cricket songs compiled by John Burton. Each species is introduced by David Ragge who takes pains to follow the guidelines over pronunciation of scientific names suggested by Marshall and Haes. Once learnt they provide a much easier means of preliminary identification in the field. It is very welcome to have these recordings available to a wide audience again, given the scarcity of the record issued with 'Ragge'.

Ray Barnett

**The Dragonflies of Europe** by R. R. Askew. Harley Books, Colchester, 1988. 294pp, including 31 colour plates, 502 text figures and 116 maps. Price £49.95. ISBN 0 946589 10 0.

A beautiful book! Amongst the recent plethora of field guides to European and British Odonata, this is the best. Askew includes 114 species in a geographical area stretching from Arctic U S S R to the Near East and Morocco. Each species is illustrated in colour, usually more than once, to indicate sexual dimorphism and colour varieties (*Ischnura elegans* has six). Additional line drawings indicate the critical characters to separate closely related species. Substantial text deals with synonymy, description of adult, biology, flight period and distribution. A detailed map indicates the most up to date information on distribution (some 1987 references are cited).

Dick Askew has produced the whole of the book himself, in just over a decade. The need for a complete key became apparent in 1976 when his eldest son sent home some dragonflies from France for identification. He then began to illustrate species in a standard way as material became available. Much of the figured material has been collected by the author, although some museum specimens are also figured; notably from the Royal Museum of Scotland and the British Museum (Natural History).

Having just acquired this magnificent book, Paul Richards and myself put it to the test on a trip to the Auvergne, Ardeche and Camargue regions of France.

Firstly, there is a problem with the size of the book (290 x 212mm). This is no volume for the pocket or the rucksack, but it sat nicely on the back seat of the mini-bus, enabling us to identify netted adults with comparative ease and leisure. (In the Camargue this was totally unnecessary as hundreds of dragonflies are slaughtered on fast roads passing through the reserve.) And it really works! A large Emperor dragonfly was identified from the beautiful colour plates as a female *Anax parthenope*. A quick cross-reference to the text to check characteristics, plus a useful sketch of *Anax* occipital triangles, then from Askew's own experience we read 'Only in the Camargue have I seen *A. parthenope* abundant' next to a European distribution map. Ideal this! More difficult genera, such as *Sympetrum*, can be keyed out. We found that the dominant species was *S. fonscolombei* and the vivid red darters were *Crocothemis erythraea*. Again Askew beat us to it 'the most vividly red of all European dragonflies ..... is abundant in the Camargue, where hundreds were found as road casualties ....' And so it goes on. In the Ardeche identification of the dusk-flying *Boyeria irene* was easy; 'the species continues to fly late in the evening.' In the Auvergne, we tried working with the smaller species. The difficult genus of blue damselflies *Coenagrion*, is well keyed, and figured with additional black and white line illustrations of male body patterns.

The introduction is a good read, even for the unconverted, and could well inspire a new generation of dragonfly enthusiasts. There is detailed coverage of biology, life histories, adult behaviour, the distribution of European dragonflies, adult morphology followed by the essential checklist and key to families.

Fully-grown dragonfly larvae leave the water in which they have developed and climb supports such as the stems of emergent plants, to cast off their larval skins or exuviae. Searching for these exuviae is a standard recording technique, and Askew recognises its importance by including a key to the final-instar larvae. Larvae of most European Odonata are recognizable to genus, but identification to species can be very difficult and uncertain.

This magnificent book will undoubtedly become the standard companion for all dragonfly enthusiasts; although some may be put off by the price. Buy this book if you have European collections, identify European specimens, or undertake field trips to the continent. If your interests are entirely British, then stay with the revised edition of C. O. Hammond's *The Dragonflies of Great Britain and Ireland* (Harley Books). However if you need to look at the British fauna in its European context, buy a copy of Askew. You will not be disappointed.

The publishers, Harley Books of Colchester, are a dedicated family business, providing an invaluable service to naturalists and museum biologists. Their other masterpieces include the multi-volume *Moths and Butterflies of Great Britain, The Dragonflies of Great Britain and Ireland* and *The Spiders of Great Britain.* They deserve our support.

Derek Whiteley

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