

PALAEONTOLOGICAL COLLECTIONS AND THE ROLE OF UNIVERSITY MUSEUMS

by ISLES STRACHAN

ABSTRACT. University museums are extremely varied in their size and content but they provide in differing ways a very important source of material for study. Some of the older British collections are briefly considered and the functions of these and the more modern university palaeontological collections discussed. Lack of finance and staff are the main problems which make the collections less used than they could be, but education of both staff and students is needed if the heritage in these museums is to be preserved.

THE size and content of university museums varies greatly but they provide a very important source of material for study. In this paper only British universities are considered and an attempt is made to evaluate their palaeontological collections. My own direct experience is limited since Birmingham University Museum has been able to supply most of the material which I have needed during a quarter of a century's research, but my knowledge and impressions of the scope of other resource centres are sufficient to review their over-all role.

British universities, like hymns, come in 'Ancient and Modern' and their museums naturally do so as well. The division is not, however, the one that is usually given in England, that is 'Oxbridge' versus 'The Rest', but a much more recent one and I would put it for practical purposes at about 1950. Few earlier museums survive in this country and those attached to the more recent foundations generally have a strictly limited function. Both old and new, however, must cater for the present needs which are, to some extent, in the process of changing and future prospects require careful consideration. There is a Standing Commission on Museums and Galleries which includes university museums in its brief, but its latest report (December 1977) covers only a small fraction of these which it had earlier (1968) considered worthy of comment and it seems unlikely in the present period of financial stringency that any of its recommendations will be implemented. In addition, very few geological collections were covered, so my comments can be regarded as quite independent of these official reports although the latter provide some valuable background data.

Historical

Most pre-1950 geological museums in universities have some palaeontological material of importance and in this review I shall consider some of those with what can be considered as major collections, from north to south through the country.

Both Edinburgh and Glasgow acquired important collections when the development of the natural sciences in the seventeenth and early eighteenth centuries made such comparative material of importance. The Balfour Collection, which was catalogued by Sibbald (1697), did not long survive in Edinburgh as later professors had differing ideas on collections, but at the beginning of the nineteenth century its

place had been taken by that administered by Robert Jameson, the leader of the Wernerian School. After his death its upkeep proved an embarrassment to the University authorities and, as Edinburgh University had been founded by the Town Council, it was easy to pass the collection over to the Council as the foundation of the town museum, now the Royal Scottish Museum. Teaching collections were then built up again within the University Geology Department and the new building in 1935 had a small room labelled 'museum' which was, however, scarcely used by the undergraduates in the early forties. Since then its history is effectively like that of 'modern' departmental museums, mainly providing material for teaching.

In contrast, Glasgow University acquired William Hunter's collection in 1783 and has maintained it as a separate institution from any department, although having close ties with the teaching side of the University. According to the 1968 Report of the Standing Commission, the collections were being dispersed as new buildings for departments provided space to house relevant parts of the collections. The geological collections, however, have not moved to the new geology teaching building. The material is used for research, project, and other class work, and a catalogue of the Begg Collection was published in 1963 (Currie and George 1963). By having its own staff, although often limited in number, and separate accommodation, the Hunterian has kept an independence which has varied in its effectiveness from time to time. The city of Glasgow has its own Kelvingrove Museum, founded in 1870, which has considerable palaeontological collections, including type material, mainly derived from members of the Geological Society of Glasgow and built up in the late nineteenth century. These might well have come to the University had there not been a fine new civic museum to house them, and an energetic geological curator.

Manchester provides a somewhat similar link between a separate museum and an academic department. Here the geological collections originally belonging to the local Natural History Society were taken over by Owens College in 1867, and more recently control (and financing) of the museum has been shared between the University and the city so that curation and display is much more oriented towards the general public. A good account of the history of the Museum and collections has been given by Eager and Preece (1977). By contrast, Mason College, Birmingham, not much younger than Owens College, was provided with a geological museum from its beginning through the purchase of collections by the Trustees. Starting with the Ketley Collection of 1650 Silurian fossils (for £250) in 1880, the collections rapidly grew with the addition of 15 000 specimens from the Samuel Sharp collection in 1884 and donations have continued up to the present, the last (as yet not fully catalogued) being the Wattison Collection of some 15 000 to 20 000 fossils, including much material from Portugal. The collections appear always to have been housed in the Geology Department and they have never been fully curated, although the type and figure material has been kept separate since 1932. The other collections have been available for teaching purposes and until very recently storage of material was a major problem since there are always competing demands for space in the Department. The collections, however, contain a great deal more than is required for teaching and are very much larger than those in the City Museum which has only a very small geological display. Again until recently, any curating of material in the departmental

museum, or change of displays, was undertaken as an extra duty by members of the teaching staff. Altogether a somewhat unsatisfactory situation.

The University Museum in Oxford is, like the Hunterian and Manchester museums, in separate accommodation from the Geology Department but the curation is done by members of the teaching staff, virtually voluntarily. Until comparatively recently, the museum building housed the academic departments but with the expansion of the departments they were moved into separate buildings. The geological collections have been added to considerably since John Phillips separated the science museum from the Ashmolean, which goes back to Tradescant's 'Ark' in the seventeenth century, and they constitute one of the more important collections of type material in the country. At Cambridge, the Sedgwick Museum still houses the University Department of Geology although expansion of the teaching side has put considerable pressure on space. The collections, which date from Woodward's originals of the early eighteenth century, are well curated with the specimens on show and in drawers in the museum all catalogued, a situation which is reached in few other university museums. Although open to the public, the Sedgwick Museum never seems to have welcomed them for some reason and the atmosphere seems to remain very academic.

Since 1950, the number of universities in the country has doubled and the number of geological departments has also increased. Each requires material for teaching and many have arranged more or less permanent displays in laboratories or corridors. Rarely, however, have these developed into a museum although some departments have allocated staff to look after their collections. In most, I suspect that each staff member looks after his own class material which is acquired gradually by purchase or field collecting. Certainly, enough material seems to be removed each year from some localities to satisfy large numbers of students and most geological material should last for quite a number of years. As a result, departments are probably acquiring larger and larger collections, some of which will never be curated adequately. With a change of staff or courses this material may well be reduced periodically to make room for other things by wholesale throwing out. This is an appalling waste of resources but it is fortunately probably not very applicable to collections of fossils since these are generally recognized as being usable, for example, by schools.

Function

Taking both old and new university museums together, it is clear that the principal function of a departmental museum is to provide material for teaching. Some of this material must be regarded as ultimately expendable although one can argue that students should be largely taught with casts of good specimens. Fossils do get broken and regular handling plus pencil and ink marks reduce once good specimens to a dark polished vagueness. Rare, good material can be put on display in cases to illustrate various themes but most fossils benefit from examination with a hand lens and good museum displays which can equally inform the student take a great deal of time in their preparation. Some combination of display and personal handling probably provides the best practical experience. Certainly students must be shown what fossils really are like in the field if they are to have any real feelings for their study. Cleaned and delicately prepared specimens undoubtedly show a great deal more than the rough field specimens, but the recognition of stratigraphically important types must

often be attempted under less than ideal conditions. The main problem here is in convincing students that the fragmentary specimens in front of them can, if carefully examined, perhaps provide as much information about the age of the rock or its conditions of deposition as the (often idealized) pictures in textbooks which, at first sight, seem to show so much more. Critical examination of specimens with the relevant monograph at hand may show that the reconstructed trilobite, for example, does not match with either the figures on the plates or the reality of the hand specimen. For this style of teaching, however, access to a good collection of fossils is essential.

Since most geological departments have research students, there is in addition to any staff research material a regular influx of specimens and data to the department. How much of this needs to be kept is a matter of varying opinion but must be touched on here since storage of material is the main point at which the geological museum meets the geological department. There is little problem with type and figured fossils since it is recognized that these must be kept somewhere for future reference, but many research topics now involve community studies with large amounts of material. This can be very difficult to catalogue unless the researcher has already individually numbered his specimens and can provide his working list of identifications. Where this has been done, need the departmental curator do anything more than suitably box the material which will possibly never be looked at again? For museums whose policy is to individually catalogue every specimen this may seem like heresy, but we do have, in Birmingham, numbered specimens taking up valuable drawer space simply because they were mentioned in a Cambridge Ph.D. thesis. They are so poor that no one would want to figure them and are probably not required even as locality material since there is not enough for any modern quantitative approach. At the time it was insisted that numbers be provided for them and I am sure that other museums have similar collections which could well be 'pruned' were they not catalogued and listed. If, however, too much material is put in store away from the main collections, it will inevitably be treated as second-rate and, without constant monitoring, will deteriorate until it becomes second-rate. Museums in universities have little hope of expansion of their space requirements and palaeontological collections may have to compete with petrological and geochemical storage needs. All published papers dealing with observations on samples brought back from the field require some substantiation of these observations to be kept. How much is required can be debated but for fossil lists at least one specimen of every taxon recorded should be kept somewhere for future checking, otherwise the lists are virtually useless. Research work on a large collection, however, is nowadays rarely completed by one person and different groups of fossils can be studied subsequently if well-localized material is kept. Much good material is probably thrown away because there is no room to store it and no staff member has an interest in it. Material from temporary exposures may be particularly valuable since re-collecting is unlikely to be possible and the specimens should be kept, preferably as a unit, until all the groups of fossils have been studied. To this extent, university museums can provide a source of research material for future generations. Much of this is at present effectively lost since few catalogues of collections exist.

Most departmental collections are not available to the general public and, even if they were, the style of display for an undergraduate course would probably not be

suitable for the layman. Where there are civic museums in the same town there is no need for the university to compete, but in some cases it is clear that the local academic department must provide a centre for local enquiry and keep a watchful eye on local developments, particularly for temporary exposures which should be well documented for future reference. This all takes time and, as in so many spheres, time is money. The major difficulty besetting university museums is lack of finance, and forward planning is virtually impossible for anything but minor expenditure. The recommendations of the Standing Commission on Museums and Galleries (1977) are unlikely to gain much support in the present financial climate however desirable it may be that university museums play their proper part in the life of the community.

What all university museums have is technical expertise in at least some variety of topics. Some departments may have only one palaeontologist on the staff but this is more than most civic museums can boast. Thus even where the collections are not fully curated, as in the Geology Department in Birmingham University, it is possible to designate the museum there as a 'centre of excellence' for geological material since in addition to much more extensive collections than those in Birmingham City Museum, the University can provide the technical expertise in a variety of palaeontological fields. Co-operation between centres is largely a matter of personalities and communication. The institution of the Geological Curators' Group and its *Newsletter* is providing a welcome forum for discussion, exchange of ideas, and, most importantly, dissemination of information. Although most university geological museums are looked after by part-time or voluntary staff, better use will be made of the collections in their care if they know what is being done elsewhere and where their specialist collections can be used. These collections provide an immense resource which is currently largely unused, and perhaps unusable through lack of curating facilities. The Eighth Report of the Standing Commission on Museums and Galleries (1970) noted in connection with university museums that '... there was a serious need of expenditure and proper curatorship to prevent loss and deterioration'. Unfortunately the Commission also notes that 'These collections are of high scientific value but of little relevance to the current trend of teaching and research'. One reason for the apparent lack of relevance may be simply that, as Craig (1969) has pointed out, a palaeontological paper remains useful until someone else re-examines the material. This, Craig thought, should be done after a period of 20 to 40 years. In other words, the palaeontological work of the post-war boom in the 1950s should perhaps only now be reconsidered while other branches of geology have already had their basic works revised at least once. The vast increase in taxonomic papers which need to be consulted for any adequate revision means that few research students can deal with more than a small fraction of the revision required, even with the supervision of an expert in the group, and there are also the numerous side attractions of palaeoecology, community studies, and functional analysis to tempt them away from what many regard as the stuffy dry bones of taxonomy. Analysis of faunas or functions, however, demands an awareness of the species being studied and although generic names may be adequate for ammonites in Jurassic studies (e.g. Brookfield 1978, p. 5) or some Palaeozoic brachiopod work (e.g. Makurath 1977, p. 240), identification to species level is really required if the conclusions are to be applied to other areas.

Training of students is fundamental to university work and it is important to instil

some appreciation of the need to conserve our heritage by making the best use of the materials available. These will, for taxonomic work, often include collections in museums as more and more of the classic collecting sites become effectively barren. This teaching will, of course, need to be started in the undergraduate years when at present much unnecessary hammering and collecting takes place. Individual university departments must take a hard look at their policies of field-work and probably restrict their acquisitiveness. Lack of space for storage may help here but adequate cataloguing of the material they already have is also vital, although often ignored. Far too many geologists are too individualistic and show a lack of concern for the ideas of others. If we are to retain the heritage which we already have in our university museums we shall have to educate the educators as well as the students.

Future

Where there is adequate storage space and staff available, it is best if teaching and research material are kept largely separate. Most geological departments will probably remain content to build up their teaching collections and not bother with retaining reference research material which can generally be passed over to one of the national collections. The danger with this is that it may later be more difficult for other research workers to study the specimens at *their* convenience, since it is not always possible to obtain funds to stay, for example, in London to examine a large collection and make comparisons with newly acquired material. Centralization of collections of type material has advantages since one visit can cover a lot of ground, particularly for overseas visitors, but it has its practical difficulties. As noted earlier, most university geological departments have a steady inflow of material from their research students but they would be acting in the best interests of palaeontology if taxonomic type material were to be presented to an appropriate established museum and stratigraphically based material passed over to the Institute of Geological Sciences or similar organizations whose collections are already primarily of that nature. Of course the material must be adequately localized.

In those universities where there is already a substantial amount of material beyond that required for teaching purposes, steps should be taken to ensure the continuing curation of the collections. Amongst the newer universities, where a department has developed a particular research interest in the last decade or more, there will usually be by now a large reference collection of specimens from other countries, perhaps casts in the case of macrofossils and other comparative material. A change of staff or of emphasis within the department can easily put such a collection in jeopardy. Collections of offprints or books which are of such great use in taxonomic work can be broken up if the department does not have its own library, but these need cataloguing if they are to be of use to subsequent researchers and not many staff are sufficiently interested or knowledgeable to undertake this. In this age of specialization, it is perhaps harder for geologists with other interests to give palaeontological work its proper place and more difficult for the palaeontologist to explain the relevance of his work to his colleagues. It is all too easy to assume that the fossils which have already survived for 300 million years can last a bit longer in the cellar while the expensive electronic machine which will be on the scrap-heap in 10 years' time needs cossetting with dozens of attendant technicians. Perhaps heads of departments all

need to remember that a heritage of fossils built up over a century or more cannot be replaced like a piece of machinery and, unlike that machinery, its potential value for research can grow continually provided that some attention is bestowed on it.

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DISCUSSION

D. L. Bruton. Dr. Strachan has mentioned the difficulty of numbering the vast number of specimens produced in students' theses. I do not see this as a problem if at the outset the student is instructed that his research collection must be carefully curated and submitted together with the finished thesis. In doing this the student is made aware of the value of his collection for the future, and at the same time is providing a valuable service for the science. We have done this in Oslo - it costs an enormous amount of money and time collecting and identifying specimens and it seems a shame if a student cannot be bothered to catalogue the specimens afterwards.

I. Strachan. Might this not mean though that a student would have to be given an extra six months to complete his thesis?

W. D. I. Rolfe. This should not be necessary. Students must be informed at the outset that such work is an integral part of the thesis requirements; they should certainly not be told three months before they begin to write up.

I. Strachan. In many cases this will mean that research students will have to be radically retrained and will have to adopt totally different attitudes from those currently held.

D. L. Bruton. If one instils into the student from the very start the philosophy of irreplaceability of specimens, then connections to the future are maintained; one would then produce a generation that would remember that the collections are part of our heritage and should be preserved for future generations.

H. W. Ball. So often one comes across the attitude that 'I have finished with this piece of work, now the material can be thrown away', even in senior and established workers. If we can persuade each research worker that he is only providing a single link in a great chain of concepts, whereas the material is eternally valid, then we will have done a great service to palaeontology.

I. Strachan. One major problem is that of space for bulky student collections. Most university geology departments simply cannot cope with retaining all the material used in a thesis.

W. D. I. Rolfe. I certainly take exception to any view that suggests that future research would not require material such as that collected for student theses. All museum people would say that ultimately a time does come when material is re-required. I would exacerbate that by suggesting a new category of 'type' material, which we have found to be necessary at the Hunterian Museum. Classical stratigraphical papers usually have faunal or floral lists which subsequent research workers often wish to validate. Unless such collections can be labelled and indexed as 'listed' they may well be subsequently overlooked.

H. S. Torrens. The problem of identifying material just cited in faunal lists could be partly solved if editors of the journals in which the research on fossils is published only accepted lists for publication provided that they were accompanied by registration data.

I. Strachan. That is one good approach and in fact is one that we have also followed at Birmingham for some collections.

J. K. Ingham. Of course policies with regard to student collections differ widely in different universities; in many it is the policy that they own the material collected by their students. For example, Hull University has large collections of this kind, but no organized museum.

H. S. Torrens. This policy at Hull University with regard to type and figured fossils collected by Hull students is directly contrary to that of my University (Keele) where it is our intended, if not stated, policy to ensure that such material *is not* preserved at the University. Some discussion about general policy is obviously needed.

M. G. Bassett. Some responsibility in this respect rests with the recognized museums themselves. At the National Museum of Wales we have made overtures to the university departments in Cardiff and Swansea to ask if Ph.D. collections could be housed in the Museum, and agreement has been reached for the future. Swansea previously had a particularly large and important type collection, which they have now passed over to the National Museum, and an assurance has been received that this practice will continue. Perhaps other museums could contact the universities in their area to try and reach such a blanket agreement.