

THE STATE AND STATUS OF GEOLOGY IN UNITED KINGDOM MUSEUMS

by P. S. DOUGHTY

ABSTRACT. The British geological heritage is a significant part of the history of the science world-wide, incorporating the work of key founding figures and major conceptual thinkers. The collections they generated and used, and those extending the traditions they established certainly survive in part, but their over-all extent in British museums is uncertain. A recent survey of geology in British museums reveals that almost half have geological collections and of this number almost one-third have significant holdings. The general curatorial situation revealed is, however, disquieting with only 44 of almost 300 museums with collections having qualified staff and many of these with too few to adequately curate their massive holdings. Significant parts of almost all collections lack information, cataloguing to modern standards hardly exists, and only 1% of institutions have complete printed catalogues. Specimens are at risk, many collections are stored in unsuitable furniture, most are poorly organized, and none are arranged according to common systems. Over 10% of museums with geological type material have no qualified staff. The situation in some of the university museums causes particular concern. A number of short- and medium-term remedies are suggested, but if permanent protection is to become a reality nothing short of the legislative safeguarding of curatorial standards is likely to be effective.

IT might be difficult to sustain the proposition that British investigators were the overwhelming influence in the development of the geological sciences, as has been claimed by some authorities (e.g. Singer 1931), but if it is unfounded, there is little doubt that a disproportionate share of the giants of the Golden Age were British, as was the creator of the principle of uniformitarianism, the key which unlocked the doors to that extraordinarily productive time. The relentless genius of James Hutton, William Smith, Charles Lyell, and Charles Darwin shifted the axis of natural philosophy, and particularly of geology, in a profound and permanent way. Even their supporting ranks of erudition included such eminent figures as Buckland, De la Beche, Geikie, Huxley, Kelvin, Lapworth, Murchison, Owen, Playfair, and Sedgwick, all of whom made important and lasting contributions to the science.

A movement of that kind, no matter how it attempted to discount its formative influences (Lyell 1830), could not be other than a product of an earlier intellectual quest, yet one denied by geology's earlier historiographers and only in comparatively recent times recognized and acknowledged (Gillespie 1959; Rudwick 1972; Porter 1977).

Renaissance Britain failed to produce scholar naturalists to match Agricola, Kentmann, Gesner, or Pallisy, but in the writings of Francis Bacon the seeds of a brand of empiricism relevant to natural philosophy were sown which developed and climbed, sometimes wavering as in the early eighteenth century, to the final heavy blossom of the Golden Age. The founding of the Royal Society in 1660 followed by the Oxford and Dublin Philosophical Societies were the germinal expression of its power, and the universities of Oxford, Cambridge, Edinburgh and Glasgow also made their contributions. In this environment the productive efforts of Hooke, Plot, William and Thomas Molyneux, Lhwyd, Woodward, Archer, Ray, Covel, Lister, Sloane, and many others were related and compared.

The shift of direction to new institutions and other social strata began in the eighteenth century with the Gentlemen's Societies (Winter 1939, 1950), the scientific societies (Read 1964), the library movement, and the emergent museums, of which the British Museum, founded in 1753, was the first public example of its kind. In the late eighteenth century Edinburgh joined this movement with the formation of the Royal Society of Edinburgh which, added to the vitality of the university, produced a potent, if parochial, arena of geological debate. It was before the Society that Hutton expounded his theory of the earth, ushering geology into its place as a modern science.

This is the early and crucial heritage of British, and world, earth science and was the base from which the massive expansion of the nineteenth century sprang, a period which, in turn, brought a popular appeal and vastly widened awareness and interest only now attracting the attention of the historian (Allen 1976).

COLLECTIONS

Porter (1977) has suggested that to some extent the making of geology from the mid seventeenth century onwards is quantifiable in terms of observers, maps, monographs, societies, and collections. Certainly for collections this thesis seems reasonable and is almost certainly true, but at present it would be difficult to establish indisputably. The Baconian view of the world inevitably led to the removal of objects from their natural settings to be the stuff of observation, comparison, analysis, and arrangement. Because they were used in this way they assumed a new importance and thus ennobled became collections. All the major figures and bodies either created, or had ready access to, important collections. This was certainly true of the Royal Society and the figures grouped around the universities of Oxford, Cambridge, and Edinburgh. The notable private collections with objects of importance to natural philosophy were numerous and acclaimed. They included those of Mead, Petiver, Sloane, Evelyn, Thoresby, Beaumont, Cole, and Woodward as well as the less discriminating but frequently more costly collections in the larger aristocratic houses (Dance 1966).

The expansion of societies from the eighteenth century onwards propagated new collections on a new scale, and outside the traditional centres of natural history culture. The evolution appears to have been from the general, the gentlemen's, literary, and philosophical societies, to the more specialized, natural history, field studies, and geological bodies, though specialization in geology was only achieved with the founding of the Geological Society of London in 1807.

Public institutions also began to make their appearance in this period, rising out of the bequests and inheritances from the first generations of great collections. The British Museum was founded by the acquisition for the British nation of the Sloane collection by an Act of Parliament in 1753. The Geological Survey, a major collection builder, was established in 1835. Fortunately both these institutions developed high standards of scholarship which seemed to go happily hand in hand with a strong sense of curatorial obligation.

The second half of the nineteenth century saw the growth of a provincial museum movement, a general expression of civic acceptance of a degree of cultural responsi-

bility. It was exactly the time when many of the society museums were in financial crisis, and this timely coincidence led to most being saved by simple transfer, or purchase for token sums. More than three-quarters of the United Kingdom's principal public museums outside London were founded between 1849 and 1900 in circumstances of this kind (*Museums Yearbooks*; Markham 1948). However, the curatorial consequences were less satisfactory. Once removed from their originators, even the residual sense of purpose, identity, and obligation felt by the ailing societies was lost. Few local authorities recognized this and fewer could afford to pay staff properly equipped for the curatorial role in its fullest sense. The intellectual tools of the Golden Age and its supreme material legacy became the didactic trappings in the shop windows of emergent public authority concerns. Ill-staffed and under-researched, these collections declined and with the rise of the new universities the sources of curatorial potential were diverted and the research interest re-centred around yet another group of collecting institutions. Though not yet thoroughly researched it seems very likely that in the United Kingdom in the first half of the twentieth century the development and curation of collections underwent one of its bleakest periods since the early eighteenth century.

POST-SECOND-WORLD-WAR DEVELOPMENTS

The last quarter century has seen a shift in the curatorial control of United Kingdom museums. The great effusion of graduates from the much expanded field of university teaching in the post-war years rapidly satisfied all the traditional sources of graduate employment, forcing examination of other possible pastures. From a profession which in the 1930s had almost no graduate intake, we are now in a situation in which there is an almost total graduate recruitment to museum curatorial posts. The Museums Association, founded in 1889, had evolved to meet the needs of the 'lost' local authority museums, and its institutions are shaped to satisfy their basic academic and curatorial requirements. It had failed to recognize that with the standards of this new proficient graduate curatorial college, there would be a movement seeking the academic tradition and intellectual skills which the universities inherited in the late nineteenth century. The Museums Association seems unable or unwilling to sponsor or accommodate this community, which has turned elsewhere for direction. Although a few bodies, such as the Museum Assistants Group offered temporary solace, their multidisciplinary nature proved a constant frustration. In fact the conflicting claims for identity between a unified museums profession, and an academic base, have bedevilled curators in the whole of the post-war period. The solution to the specialist problem lay with the curators concerned, and slowly a series of so-called 'specialist groups' emerged, one of the most vigorous being the Geological Curators' Group (GCG) founded in 1974, whose constitution includes the following objectives:

- provision of information and advice on all matters relating to geology in museums;
- surveillance of collections of geological specimens and information with a view to ensuring their well-being;
- preparation of a code of practice for the curation and deployment of collections;
- initiating and conducting surveys relating to the aims of the group.

The last section shows that without doubt a great inheritance of collections from the mid seventeenth century to the present has existed, but to what extent it has withstood the ravages of fashion and the passages of ownership, interest, and neglect is not certain. It could be the concrete representation of the great thinkers of British natural philosophy and could have within it the possible solution of many unanswered philosophical and scientific problems. Without doubt some collections have vanished without trace (Torrens 1974, 1976), others have decayed (Cooper 1974), and yet others have undergone the subversion of negligence with its associated displacement of documentation (Copp 1975; Pickford 1975).

The disquiet emanating from ignorance of almost all other things geological in museums was immediately voiced by the Group (Doughty 1974) but the overwhelming need was for information on the major collections, to discover how many remained, whether there were large untouched areas, how they were being kept, and by whom. It was therefore decided to invoke the fourth objective of the Group as just stated and to devise a survey which would provide a current statement of the situation.

THE SURVEY

The survey was conducted by questionnaire, this one a strange departure from the fine pedigree of earlier geological questionnaires in the line of those of Lhwyd, Woodward, and Plot. It was circulated to all museums or multi-museum authorities in the United Kingdom, which on a final rationalized list numbered some 581. Of this number, returns in various degrees of completeness were received from 569 (98%). This level of co-operation lends substantial authority to the findings, although due allowance has to be made for differences in the quality of information returned from one to another.

The findings will be published in full elsewhere but many have a bearing on this paper and so are included. The British Museum (Natural History) Departments of Mineralogy and Palaeontology, and the Geological Museum (Institute of Geological Sciences) are omitted from the general survey and treated separately because their organization and operation are unique in British geology.

Of the remaining group of museums it was discovered that almost half have geological collections. This means that 281 museums have geological specimens, an unsuspectedly high number. When the sizes of these collections were analysed it was revealed that about one-third had more than 5000 specimens, and almost one-fifth had over 10000. Of this fifth it is known that many number their specimens in hundreds of thousands. It is conservatively estimated that in total this whole group of museums holds some three to five million geological specimens. The questionnaire also sought to establish the whereabouts of published collections, and respondents named some 800 in their institutions. This list was far from complete, almost all respondents from large museums stating that only their principal collections were given. The compilation of this information has revealed fragments of many significant collections, formerly considered lost, in centres where one would normally never think of enquiring. Clearly the history of disposal and dispersion of collections is far more elaborate than at present understood. Research enquiries which have foundered elsewhere have been met, often in substance, from this list.

The balance of collections in terms of rocks, fossils, and minerals was good, most museums having all three sections represented. However, fewer than one-third of museums with rock collections considered that they had good general cover, contrasting with around half which had good local collections. About one-fifth of the museums had special strengths in their rock collections, and about one-tenth had figured and cited specimens.

Of the three major divisions, palaeontology is strongest in most museums, over 90% having fossils. Over half of them have good local collections, one-third have good general cover, and one-quarter palaeontological material of special interest. In view of the overriding importance of the type concept in palaeontology, types place a more solemn obligation on curators than almost any other kinds of museum objects. The survey revealed that between one-fifth and one-quarter of museums have palaeontological types and that about one-quarter have figured and cited material.

85% of collections have mineral material, about one-third claiming good local cover, slightly more claiming good general cover, but only 36 museums considering that they have particular strengths. It appears from the survey that there are far fewer museums with strong mineral collections than there are with fossils and rocks.

The fields of maps, manuscripts, photographs, and personalia of geologists are currently assuming greater importance and enquiries revealed that about half the museums have collections of maps. Although no attempt was made to distinguish historical maps from recent and current Geological Survey sheets, it seems likely from the nature of many of the museums in this group that nationally there are likely to be useful collections of important maps.

It emerges quite clearly from this part of the survey that there is a vast fund of geological interest stored in United Kingdom museums. It is equally certain that many collections, probably as many as a half, are small and will have little of geological note or worth to commend them to the academic geologist. But that still leaves a great wealth of material: much of local, some of national, and in view of the importance of the British Isles in the history and development of geology, much of international importance. The heritage survives, not intact, but certainly in substance.

To use a collection its existence must be known; its composition, and information relating to the specimens must be available. In fact only 6% of museums with geology collections have printed catalogues covering part of their collections. Only 1% have catalogues of the entire collection, and in all these cases the total number of specimens is small. If collections are not listed by Sherborn (1940), and the vast majority are not, there is no other primary source available. The standard of documentation within the museums was examined and only one-quarter were found to have original data on more than 75% of their specimens. Over one-third had original data for less than 25% of the collection. Since most of the collections are in about one-fifth of museums, the larger museums (10 000+ specimen collections) were examined separately and it was found that half had good data for more than 75% of specimens and one-quarter for between 50% and 75% of their specimens.

All museums have an obligation to maintain a register, index, or some other form of documentation of their specimens, and the investigation shows that less than half the museums have most of their collections documented. 16% of museums had

no documentation of any kind and one museum in this group has very large collections. Standards of documentation were not examined because judgement is subjective, but automated data handling to modern standards is in its infancy in United Kingdom museums and there is only likely to be one museum capable of meeting research demands comprehensively at the present time. The GCG has collaborated closely with the Information Retrieval Group of the Museums Association and the Museums Documentation Association in developing data standards of a very high order, but formats have only been available for a little over two years, although some of the major geological museums have adopted them.

However, there is little point in museums listing collections and documenting them if they do not maintain specimens in good order, in storage which renders them accessible to users. The condition of specimens was examined using a simple condition description. Museums were asked whether specimens were in good, indifferent, or bad condition according to the following definitions:

'Good' = sound and clean

'Indifferent' = sound but dirty or exposed to risk

'Bad' = specimens deteriorating physically due to pyrite disease, fragmentation, constant abrasion, or other causes.

Over half the museums admitted to having a part of their collection dirty and about one-third knew that they had some specimens in bad condition. It was impossible from the questionnaire to get an over-all view of specimen condition, but most of the really large collections have no specimens in bad condition, although generally it is clear that there are vast numbers of specimens deteriorating and many thousands of others in need of attention.

The type of storage furniture used was also investigated. Museums were asked whether they stored in either drawered cabinets, shelved cabinets, cardboard boxes, or crates and packing-cases. The highest curatorial convenience is represented by drawered cabinets and the rest follow in the order stated. Over half the museums use drawered cabinets to store specimens and about one-fifth use only this type of furniture. Just over one-third use shelved cabinets, a half cardboard boxes, and one-fifth crates and packing-cases. Most museums clearly use more than one type of storage furniture. There must be real concern for collections in the high proportion of museums using cardboard boxes for storage. Although a half use them for some part of their storage, further analysis shows that one-seventh use nothing else. The long-term security of specimens cannot be guaranteed in such containers. Around 2% of museums employ packing cases only, which can be sound in ideal circumstances, but, because they render specimens inaccessible and unseen, have inherent risks.

The organization of specimens in storage was also examined and over one-third and possibly as many as a half of museums have no organization of material in store. A small, but significant, number of large collections are also in this condition.

The systems of classification employed were given by some museums and analysis showed that although common principles were used in larger collections, even here they are not applied uniformly. In general the classifications used are so diverse as to represent chaos for users. There is no standardization of systems; few museums employ a sound academic base, and many organize for administrative rather than

user convenience. This is an area deserving consideration by curators because there are no systems widely published and approved, and there is the feeling that in this vacuum any alternative understandable scheme has been seized on.

In recent years a few museums have not allowed access to collections. The questionnaire returns demonstrated that only 2% of museums would not allow professional users in at the time of the survey. It seems likely that at any time such a proportion may not allow access for perfectly valid reasons. There appear to be very few museums which limit access to conceal unsatisfactory curatorial conditions.

The final major area examined was staffing. Museums were asked whether they had a post for a full-time geological officer, and the replies showed that only 44 of the 281 museums with geological collections had curators specifically responsible for them. There are at least 100 museums in the United Kingdom with important geological collections yet only 44 with geological staff, not all in the major groups. Of the 49 museums with very large collections only 28 have qualified staff, and of the similar number with smaller but important collections only 12 have staff.

Since many of the collections are so large and important that large geology departments might be needed to perform the curatorial role, some attempt was made to establish how many museums employed more than one geologist. The declarations in this section were strangely vague but it emerges that at least twenty-four museums claim more than one member of staff working on geological collections.

Some attempt was also made to establish whether there was any kind of curatorial cover of the geology collections in the 237 museums without geology staff. In fact, fewer than one-fifth have staff with curatorial time allocated to their geology collections, leaving at least 160, and possibly as many as 180, with no staff time allocated. There are nine major geological museums in this group, a situation which can only be described as profoundly unsatisfactory.

The survey revealed a number of other important issues related to staffing. Over 60% of museums admitted that they needed specialist geological help urgently, including a large number with full-time geological staff. Only one-third of museums with figured and cited rock collections have geological staff. Only one-third of museums with fossil type material have geological staff, which means that there are forty museums with type holdings and no geological expertise. Documentation of collections tends to be practised more where full-time staff are available, but only one-quarter of the collections with most of their specimens documented have qualified staff, which leads one to question the quality of documentation in the other three-quarters.

Indeed the general geological curatorial situation in United Kingdom museums is horrific. There is still surviving a vast heritage of geological material, but it lacks documentation, collection lists, published catalogues, and has hardly ventured into automated data storage and retrieval systems. Tens, if not hundreds, of thousands of specimens are dirty or at risk, requiring technical attention. Masses of specimens are stored in cardboard boxes or packing-cases, and possibly half the museums with collections have no organization of storage. Where stores are arranged the systems used are diverse and many more suited to administrative convenience than to user needs. At the root of the entire problem appears to be a chronic staff shortage, with only forty-four museums employing geological staff. Frightening vastnesses of the

geological heritage, including some of its most important material, are entirely uncurated.

The British Museum (Natural History) departments of Palaeontology and Mineralogy do not escape similar problems. The collections in total may number between ten and twelve million specimens (including foraminifera) and represent the United Kingdom's premier repository, but although named collections are listed in various publications there is no unified statement, and documentation of the collection is primitive for the most part. Storage standards are high with good-quality furniture for most of the collection, and only minor difficulties with atmosphere. The collections are well organized but even here about one-third of the specimens are in indifferent condition, and perhaps as many as 5% at risk. Staffing, however, in common with the rest of geological museums, remains a problem with only around eighty current curatorial/research staff, declining steadily under a policy of non-replacement. In these circumstances the flow of suitably trained curators cannot be maintained and the traditions of sections, and contacts with overseas research workers, are suffering in consequence. If this continues for any time, lasting damage will be done.

The collections of the Institute of Geological Sciences are not museum collections in any normal sense and the Geological Museum has no curatorial responsibility for them. Strictly they therefore fall outside the range of the investigation but there will be comment in the full report.

OBSERVATIONS AND RECOMMENDATIONS

Observations and impressions have emerged from this work which suggest possible remedies to the general distemper.

1. In status geology does not occupy the position it should in the museum movement. Its historical association with natural history has operated to the detriment of geology, with zoology and botany receiving much better cover, largely because both could be serviced by a single graduate. As a museum discipline geology is radically different from zoology and botany, particularly where rock and mineral collections are included. Alongside biology and archaeology departments which have collections of similar size, but often lesser importance, geology needs to make greater impact. Museum geologists should not compromise on the independence of their subject area in the fields of collections and training.

2. There are 160 museums without curatorial cover of any kind for their collections. This scandalous situation must be tackled with constant, unrelenting presentation of the case to all the relevant authorities. Lines of action suggested are:

(a) Identification of the important collections, followed by pressure on the owning authority for suitable posts to be established.

(b) Pressure on Museum Area Councils to give support to all other collections, though in the light of the findings of this survey the Area Council concept seems totally inadequate to meet the need. Indeed it appears that none employs geological staff.

(c) GCG continuing its efforts to assist, though again it must be recognized that at best this can only scratch the surface.

3. Pragmatically it must be acknowledged that non-geological curators will continue their responsibility for geological material for some time to come. GCG could help enormously by agreeing a small number of practical systems for organizing geological material. They should be comprehensive, easy to use, fully published, and serviced by an advisory panel of GCG.

4. The university museums, which have been heavily criticized by the recent Standing Commission Report (HMSO 1977), emerge as a field of serious concern in this survey. Although some of the best large museums are university administered, some of the worst, including six with no curatorial staff or time allocated, are also in this group. The future of these museums is entirely dependent on the whim of the university departments concerned and many have not assumed their curatorial responsibilities, and many which have may allow it to lapse in the future.

5. The time to begin discussions on rationalizing the large numbers of unviable geology collections cannot be long delayed. Although these types of discussion are generally fraught and emotive, the general issues are clear and unavoidable.

6. All the remedies suggested are piecemeal attempts to shore up a decayed structure. The underpinning essential for the founding of a profession, for there is most certainly nothing of the kind now in existence in museum geology, relates to the enforcement of standards, which in turn means the availability of finance to create and administer them. There seems now no alternative to presenting a case to government for the establishing and safeguarding of curatorial standards by legislation. Without such action many of the problems will continue, become more acute, or simply disappear as the heritage we are attempting to preserve returns to the mineral dust from which it was created.

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Editorial note. Mr. Doughty was unable to attend the colloquium to present his paper, which was read for him by Dr. M. G. Bassett. Many of the points raised here provoked considerable discussion, and where possible these have been incorporated in the Summary of the meeting (p. 269).