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THE ARCHITECTURE OF SCOTTISH
UNIVERSITY MUSEUMS
1789 - 1930

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Thesis for degree of M.Phil.
March 1999



TH D 492

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INTRODUCTION

This research covers the period 1789 - 1930; from Robert Adam's designs for Edinburgh University's Natural History Museum in 1789, to the completion of the 1930 Robert Lorimer and John Matthew Animal Genetics Research Museum, Edinburgh. Museums built after 1930 have not been tackled in this discussion. There was a movement in Scottish universities during the 1970s which witnessed the establishment of purpose-built spaces for the exhibition of permanent collections of fine art, and also for the display of temporary shows. This is a separate subject in its own right. In a piece of work of this length, it would be very difficult to cover this topic succinctly within a discussion of (mostly) natural history museums of the period 1789 - 1930. That is not to say however that these later museums should not be considered against a background of almost one and a half centuries of Scottish university patronage of museum collections. Whilst the educational establishments of Scotland did not have the same sort of record as England in the acquisition of, and provision for, fine art, they still amassed and displayed collections of painting. The later, 1970s group are worthy of a study, and should be considered in the light of the evidence presented in this work.

It is a complex matter to decide what to include under the umbrella term 'university' museum. The decision to include or exclude certain museums and educational institutions is ultimately subjective and open to debate. The collections of the Phrenological Trust, the Royal College of Surgeons, and the Dick

Veterinary College (prior to its elevation to the position of Royal (Dick) Veterinary College) have been included despite the fact that they did not officially pertain to an established university. These institutions did not enjoy university status but were inextricably linked with a university and, without actually having a Royal Incorporation to the effect, functioned as such.

Certain museums have not been discussed here despite the fact that they relate to the group under discussion. It has been necessary to omit the museums of Patrick Geddes's Outlook Tower, Edinburgh, the Highland Society, Edinburgh, and the many museums of the learned societies. It would have been useful to look at these museums in this context, but they are excluded because a work of this length necessitates the imposition of artificial parameters.

Only those museums which were purpose-built to accommodate university collections are included. An exception has been made in the case of Rowand Anderson and Balfour Paul's New Barclay, Royal College of Surgeons. The tenement in which the Barclay Museum was located underwent such significant conversion and internal remodelling that to all intents and purposes it can be considered purpose-built. Collections that were housed in rooms designed for entirely different purposes, and which were not remodelled to suit a different use, are not discussed here.

Thirty purpose-built museums are covered in this research (see Appendix 2). A further thirty individual museum spaces have been mentioned although not covered in any great depth (see Appendix 4). The latter are mostly the numerous class and departmental,

subsidiary museums of the large college schemes. These have not been discussed in separate sections because the majority were essentially unremarkable multi-purpose spaces and far too numerous to mention individually. Other museums like that designed for the Botany Department, University College, Dundee or the museums of the Departments of Botany and Materia Medica, Marischal College, Aberdeen are certainly worthy of deeper investigation but few primary and secondary sources have been located for these museums. The latter two have been mentioned in some depth but they deserve a much fuller account than has been offered here (1).

There has been no previous attempt to look at the architecture and history of Scottish university museums as a particular architectural typology. Research of this kind has been conducted on the museums of the Andersonian and the Old Hunterian, both Glasgow, by T. A. Markus (2). There is also a comprehensive history of the building of Edinburgh University's Old College by Andrew Fraser (3). They are detailed in-depth descriptions but they make no attempt to place university museums within the context of a wider pattern of Scottish University museum building during the nineteenth and twentieth centuries. Some of the museums covered in this essay are well known, and have been written about in some detail. There has, however, hitherto been no piece of work in which descriptions of all Scottish university museums has been brought together and studied as a building type.

The Natural History Museum, University of Edinburgh, the Hunterian, University of Glasgow, and Marischal College Museum, University of Aberdeen are all well known and documented, but

there is a wealth of 'lesser' museums whose existence has been largely forgotten or ignored. Given the prominence that these spaces once enjoyed, and the central role that they played in university education it is important to study this group, and attempt to resurrect them from their present obscurity.

This is the first survey of all significant Scottish University museums which deals with the construction of museums by educational institutions as a movement or phenomenon. It is therefore also the first full, contextual study of this architectural group which considers the university museum against a broader background of issues and considerations.

The main body of this work constitutes a history of the inception of thirty Scottish university museums, and includes an architectural description of the museum spaces, and the buildings in which they were housed.

Preceding this are a number of essays discussing the conclusions drawn from this evidence. The first concentrates on the nature of, and reason for, the rise of university collecting. In addition, museum provision is placed in a broader context of Scottish university expansion. Following on from this, the second essay examines the distinctive features and recurring themes of this group of buildings which are brought together in order to examine university museums as a distinct architectural typology. The third topic under discussion is the effect on the pattern of museum building occasioned by changes in the nature of university education and developments in science. Finally, there is an inquiry into the close physical and metaphysical relationship between the university library and museum.

THE HISTORY OF UNIVERSITY COLLECTIONS

British university museum collections have a long history dating back to the seventeenth century. The close association of museums and educational institutions finds an early precedent in Oxford University's Ashmolean Museum. Opened in 1683, it was both the first public museum in Britain, and also the earliest example of a purpose-built university museum space. Oxford set an important example in the provision of room within universities for collections although it was over a century before others followed this lead. Beginning in 1789 with Robert Adam's plans for Edinburgh University's New College, and the opening of Glasgow University's Hunterian Museum in 1807, educational institutions in England and Scotland made it a priority to erect museum accommodation throughout the nineteenth and early twentieth centuries.

Following this, English university museums were established in large numbers at Cambridge, Oxford and London. The new universities in the north of England also erected buildings to house their collections such as that designed by Alfred Waterhouse for Owen's College in Manchester (1869) (See appx.5). This trend was no less strong in Scotland where the old universities of Aberdeen, Edinburgh, Glasgow and St. Andrews, and the new University College, Dundee, all established museums.

The tradition of housing museum collections within educational institutions is a long one. Historically, universities have always been seen as one of the most appropriate venues to keep collections of natural history, medical science, archaeology,

ethnography and fine art. Prior to the Museum Acts of 1845, 1850 and 1867, which encouraged the establishment of municipal museums, the collections of universities and the learned societies comprised the only truly public and methodically organised museums in Britain. Collections of natural history and fine art found in the private houses of the landed gentry were often little more than cabinets of curiosity. They were rarely arranged in any order that would render them scientifically useful, they were not accessible to the general public, and only a handful of them were housed in accommodation designed specifically for the purpose.

That the university environment was considered the most appropriate setting for collections of scientific specimens is hardly surprising given that the main functions of a university are education and research. These collections of natural history and medicine (and to a lesser extent those of archaeology and ethnography) formed the most important resource for teaching and research in the eighteenth and nineteenth centuries. They constituted the primary source or evidence for the truths and facts of science being taught in the classroom, and in this respect were equally as important a resource as the library. David Murray, who wrote extensively on the subject of Glasgow University (and museums in general) made the comment that:

Every Professor of a branch of science requires a museum and a laboratory for his department; and accordingly in all our great universities and other teaching institutions we have independent museums of botany, palaeontology, geology, mineralogy, and zoology, of anatomy, physiology, pathology

and *materia medica*, of archaeology - prehistoric and historic, classical and Christian - each subject taught having its own appropriate collection. (4)

In her report 'A World of Learning - University Collections in Scotland', Laura Drysdale identifies ninety-nine university collections (5). Of these there are eleven each of archaeological and anthropological, and medical science collections, twenty two of fine and decorative art, twenty three natural science collections, and thirty seven collections of scientific instruments (6). The pattern of university museum building in Scotland does not reflect these figures. Using Drysdale's groupings of types for the purposes of comparison it can be seen that Scottish universities clearly placed a greater emphasis on their collections of natural history and medical science (see appendix 4). There were thirty museums for medical science, three pertaining to archaeology and anthropology, only one each for fine art and scientific instruments, twenty one for natural science, and four 'general' museums (7).

Despite the large numbers of collections of archaeology, anthropology, fine and decorative art, and scientific instruments, there were very few museums devoted solely to these subjects in comparison to the large numbers built for medical and natural science. These areas were certainly represented in the first, general university museums, which were not devoted to any one particular subject, but there are few examples of spaces being designated specifically to accommodate these types of collections. The Old and New Hunterian, Museum of the Andersonian, Marischal Museum, and the Natural History Museums of

Edinburgh and St. Andrews Universities were quite general and held collections covering a broad spectrum of subjects.

Objects of artistic, cultural, historical, or social significance were much better provided for in the English universities. There is no university in Scotland that can match the Ashmolean Museum, Oxford, or the Fitzwilliam Museum, Cambridge, either in terms of the collections or the building itself. The trend towards provision of purpose-built accommodation for fine art in Scotland occurred much later on in the twentieth century.

A significant number of Scottish collections came into the possession of the university passively; as donations, bequests or by accident because of confusion over ownership. It is rare, in the early history of university collections, that there was ever an active policy to collect. The collections had their origins in the activities and interests of individuals associated with educational establishments, and the learned societies. F. J. Knox, Assistant Keeper of the Royal College of Surgeons in 1836, observed that:

Each individual exhibits certain peculiarities proper to themselves, and ... every museum takes its character, as it were, from the person who may have formed that collection. It is sufficiently striking that most anatomical collections now existing have been founded and completed by single private individuals. (8)

Scottish university museums house collections covering a wide variety of different subjects which often reflect the tastes and interests of the individuals or groups that formed the original

collection. These individuals, over the course of the nineteenth century, relinquished care, and often title, of the collection to a university either directly or via a learned society.

The reasons for this were usually financial. Collections of natural history were expensive to maintain and learned societies that had set out to create a museum frequently found themselves with little or no income to finance care of either the collection or the building in which it was housed. A vast majority of Scottish university museums were started in this way. Individuals who donated collections usually did so in the spirit of philanthropy. They intended that their life's work should be made freely accessible to individuals studying whatever subject the collection illustrated. Often the collection came into the possession of the university because the individual responsible for amassing it was an academic who had taught there. In these cases ownership was often ambiguous and there are examples of a university assuming title of a collection upon the death of a former employee when in fact it was heritable estate. The Natural History Museum at Edinburgh University was severely depleted after the death of Professor John Walker in 1804. As Keeper of the museum he had built up the collection during the last two decades of the eighteenth century but his family assumed title to the greater part of the collection upon his death. It is equally true that collections which appear to have been the property of the university were treated as private property by the academic curating it. This overlapping of personal and private property is due to the fact that an academic would often use a personal collection to teach a subject. This was then augmented during a

career so that what belonged to the individual and what was more rightfully the possession of any given department was a complex matter. By whatever method the university acquired the initial foundation of its museum it was rarely as a consequence of an active decision to collect.

As a result of the almost accidental, passive method of collecting, new acquisitions of specimens and objects were invariably housed and displayed in appropriated rooms within the existing college buildings. Without exception these arrangements were unsuitable from the outset both in terms of the shortage of space and because certain collections could not be adequately displayed in the sort of architecture designed for other purposes. This was particularly true for some of the very large specimens typical of zoological collections. Contemporary accounts of these early interim arrangements illustrate the chaotic and unsuitable conditions in which collections tended to be kept. Prior to the provision of purpose-built museums the collections of some educational establishments were housed in quarters which were so unsuited to the purpose for which they had been appropriated that the departments found it impossible to use their collections to any useful end.

The pattern of university museum building during the course of the nineteenth and early twentieth centuries was part of a much broader phase of expansion that witnessed major building projects in universities throughout England and Scotland. Increasing student numbers, the need for laboratories and large lecture halls, and the growth of library and museum collections all played a part in this. In all cases improvements and expansion

were a reaction to a chronic shortage of space and constitute a response after the event. Universities never tackled the problem of providing adequate rooms for their collections until conditions were so adverse as to threaten the very fabric and function of the collection.

Within all of the expansion projects of the late eighteenth, nineteenth and early twentieth centuries in educational establishments in Scotland splendid and spacious apartments were designed for university museums.

Also included in this group of early museums are the enormous museums of the New Hunterian, Glasgow (1866 - 70) and Edinburgh University Medical School (1875). Although they are actually much later they belong with the first phase of museum building. The latter was outdated before it was even erected, and marks something of landmark in being the last of its kind.

This first wave of museum construction represents the high point when university collections were accorded a uniquely privileged status. Their function at this time was as an aid both to teaching and research but, more importantly, they were a showpiece with which the university advertised the sum total of its achievements. These collections and their apartments were designed to impress the general public and academics from other institutions. There was a great deal of competition both within Scotland itself but also between universities on either side of the border. In particular the teaching of medicine was fiercely competitive between the four Scottish universities, and Oxford and Cambridge. During the first half of the nineteenth century 300 students graduated in medicine from the two English

universities compared with the 8000 who graduated from Edinburgh, Glasgow and St. Andrews (9). However, with the establishment of King's College, London (1829), and University College, London (1833), there was a significant challenge to Edinburgh's pre-eminence in the subject. Similarly, Edinburgh fought with London to attract students and official recognition in the teaching of veterinary surgery.

During the last quarter of the nineteenth century and the early twentieth century Scotland witnessed a second phase of university museum building. These later museums were considerably smaller in terms of size and conception. Some like that of the Geology Department, Glasgow or the many class museums in the 1895 Marischal College extension, were undifferentiated spaces which could have been used to fulfil a number of purposes. They were spaces which, aside from the presence of museum specimens and furniture, bear no obvious sign of being designed as museums. They were side-lit, single storey rooms and obviously intended only to be accessed by students of the department. They are private, functional rooms with no excess of ornament, and were not designed to impress like so many of the earlier museums.

There are however a significant number of museums built toward the end of the nineteenth, and at the beginning of the twentieth century which, although designed on a much smaller scale, nonetheless conform to the traditional early nineteenth century concept of the museum as architecture. Burnet's museums of anatomy, botany and zoology (Glasgow) illustrate this point very well.

THE ARCHITECTURE OF SCOTTISH UNIVERSITY MUSEUMS

All of the thirty museums covered here have a common set of distinctive architectural characteristics. In terms of style, proportions, internal arrangement of space, and lighting the architects commissioned to design these museums developed an easily recognised style. There was clearly a widely accepted standard as to what constituted an appropriate design for a museum in which to display university collections. This was not, however, an exclusively Scottish feature, but something common to the majority of all British university museums. It can be seen also at the universities of London, Cambridge, Manchester, Newcastle and Oxford. Neither would it seem that it is a Scottish invention. The very earliest example of a galleried, top-lit museum hall in Scotland is the Natural History Museum, University of Edinburgh (1816) (Fig. 92), but this is preceded by the museums of the Royal College of Surgeons, London (1806 - 1813) (Fig. 93).

Scottish national and municipal museums also used what was clearly considered an accepted design for this particular type of architecture. However, since these were erected after this style had been well established it seems obvious that the universities led the way. The very earliest public museums; Montrose (1841/42) and Elgin (c.1843), post-date certain key museums such as the Natural History Museum, University of Edinburgh (1816) (Figs.16 & 17), Anderson's Museum (1830) (Figs.60 & 61), and Marischal Museum (1834) (Figs.3 & 4).

University museums are different to public examples because

they were rarely free-standing structures. In fact there is only one example of a university museum that was entirely independent of a larger college scheme or departmental building. This was William Stark's Old Hunterian which, built in 1804, was the first university museum (10) (Figs.46 & 47). As a result of this it is also the only example of a university museum with external architecture that announces its function. Every other museum covered in this study was part of a much larger building in which other activities were conducted. Consequently, there is a recognised style for college architecture, but no definitive facade for this type of museum.

In England there were more free-standing university museums which were much larger than anything found in Scotland. Two of these in particular, the Fitzwilliam, Cambridge (1847) and the Ashmolean, Oxford (1845), were vast neo Classical conceptions, with facades that announce the function of the building (Figs.94 & 97). They are typical examples of the art gallery genre and are instantly recognisable as such. However, the numerous small college museums at Oxford and Cambridge, like those in Scotland, were subsumed within a larger building programme, and cannot be readily distinguished to the exterior.

As a rule the interior of the museum was a reflection of the facade. Where the entire college scheme is Gothic, the museum is decorated in the same style, and similarly neo Classical buildings contain museum interiors that are in harmony with the overall style of the college. With the exception of the museums of King's and Marischal Colleges, Aberdeen and New College, Glasgow, universities were generally predisposed towards the

classical.

Some of the later university museums in Scotland adopted the classical for the museum interior irrespective of the exterior. In some cases the contrast is so marked that the effect is quite startling. John James Burnet's design for the Zoology Department, Glasgow is one of the most obvious examples (Fig.73). The decidedly un-classical, functional facade is entirely at odds with the beautiful Doric columns and terrazzo steps of the museum inside. The same is also true of Rowand Anderson and Balfour Paul's New Barclay Museum for the Royal College of Surgeons, Edinburgh (Fig. 29 & 30).

From the outset classical architecture has been preferred above all other styles for museums and art galleries, and is by no means exclusive to those attached to educational institutions. Neither is it restricted solely to museum architecture; the classical language dominated the architectural vocabulary of all centres of learning. Whilst it was not always practical or financially viable for a university to construct an entire neo Classical college scheme, of the sort designed by William Wilkins for University College, London (Fig. 99), museum interiors at least conform to the idea that a museum should be classical. Gothic was employed for museums during the Victorian era, notably in England at the Natural History Museum, Oxford (1860) (Figs.95 & 96), and in Scotland at Marischal College, Aberdeen (1834 & 1891) and New College, Glasgow (1866). However the classical was employed with a greater frequency because it symbolised order and reason. It was associated with architectural and intellectual purity.

A characteristic of these museums is their configuration; a large single oblong hall often with a mezzanine. Occasionally a cabinet or additional room led off the main museum hall as at the New Hunterian, Glasgow or the Natural History Museum, New College, Edinburgh (Fig. 15). University museums were never designed with the complex sub-divided spaces of the Public and National galleries. It is quite exceptional that the museum comprised a suite of interrelating rooms. Robert Adam's unexecuted design for the museum of the New College, Edinburgh (Fig. 9) and Stark's Old Hunterian (Figs. 42 & 43) are significant museums that deviate from this rule. The former is the earliest known design for a university museum, and the latter the earliest built. Museum design after this was considerably simpler.

Four museums; The Old Hunterian, Glasgow, The Andersonian, Glasgow (Fig. 60), and the Anatomy and Fine Art Museums, New College, Edinburgh (Figs. 18 & 19) were centrally-planned. The Andersonian was circular and is the only one of its kind in this study. The two Edinburgh museums were octagonal, as was the central space at the Old Hunterian. The shape of the Anatomy Museum was modelled on that of continental dissecting theatres.

The majority carried a single mezzanine around two, three or four walls. One of the subsidiary museum spaces in the Hill Square extension to the Royal College of Surgeons, Edinburgh (Fig. 28) and the Zoology Museum, University of Edinburgh (Fig. 21) had just a single mezzanine, but they are unusual. In fact the latter was not even a true mezzanine since it did not overhang the walls of the museum hall, but was a first floor

cabinet which overlooked the ground floor. A similar arrangement is found at the Bell Pettigrew Museum, St. Andrews (Fig. 86) where the mezzanine was not cantilevered or carried on supports, but was constructed above rooms outwith the museum hall.

Those museums without a mezzanine tend to be later, for example the Lorimer and Matthew museums for the Geology (1929) (Fig. 23) and Animal Genetics Research (1930) Departments, Edinburgh.

Similarly, the private class museums of the large college schemes tend to have been designed without a gallery. As a general rule where the museum is large, public and top-lit the architect has included a gallery, and where it is small, private and side-lit, he has not. There are obviously exceptions to this rule: the *materia medica* and botany class museums of the 1891 Marshall Mackenzie extension to Marischal College (Fig. 7) had a mezzanine, as did the Skull Room at the Edinburgh University Medical School (Fig. 39).

Two Scottish university museums had a double mezzanine; the Anatomy Museum of the Medical School, Edinburgh (Fig. 38) and Botany Museum, Glasgow University (Figs. 69 & 70). The former was almost certainly inspired by the National Museum, Edinburgh (Fig. 92). Rowand Anderson may also have been influenced after encountering the same feature at Owen's College, Manchester (1869) and at the Royal College of Surgeons, London (1806 - 1813) (Fig. 93). Although it is not possible to prove it Burnet must have used Anderson's museum as a model for his later Botany Museum. Not only did it have a double mezzanine, but the architect also employed two spiral staircases, standing in opposite corners, to provide access to the gallery.

Movement between the principal floor of the museum and the gallery was usually direct. Functional, narrow staircases were placed in one or more corners. The exact number of stairs tended to depend on the size of the museum, although in some cases, even in relatively small spaces, the architect provided a surprising number of access points. The New Hunterian, Glasgow was an enormous museum which measured 129 x 60 ft. and had two staircases ascending to the mezzanine. At the Anatomy Museum, Glasgow the museum was considerably smaller, c.65 x 45 ft., yet it had four sets of stairs.

The sort of grand, centrally-placed staircases like those seen at the Andersonian Museum, Glasgow (Fig. 60) and the Botany and Materia Medica Museums, Marischal College, Aberdeen (Fig. 7) are the exception, not the rule. Staircases that communicated between the main museum floor and the gallery were generally discreet, narrow, and very rarely used as an architectural feature. Even in the large, showpiece museums, where it would have been perfectly in keeping to find a grand, imposing staircase, the architect has not availed of the chance to add any structural embellishment.

In five cases the architect has provided no direct access between the principal floor of the museum and the gallery. The visitor is required to move outside of the museum and negotiate corridors and a common staircase in order to move between the two. This is interesting because on a visual level the relationship between the two spaces is strong, but they are physically placed at quite a distance. The architect has merely created the illusion of physical proximity. Four of the museums are relatively late; Zoology Museum (1892) (Fig. 91) and

Anatomy Museum (1900), United College, Dundee, Bell Pettigrew Museum, St. Andrews (1908) (Fig. 82), and the Zoology Museum, Edinburgh (1927). The fifth example is Marischal Museum, Aberdeen (1834) (Figs. 4 & 8). Looking at the architecture of all other examples covered in this work it seems obvious that direct physical access between the two floors was considered something of a prerequisite in museum design. Why these architects should have chosen to arrange their museums in this way is difficult to understand. It can not have been as a result of limited space since these are quite large museums. The smallest of the four is the Anatomy Museum, Dundee. It could certainly never be said in this case that the architects were concerned about conserving space given that the mezzanine had no practical architectural function. It has been included here as either a decorative feature, or because of a desire to adhere to the traditions of museum design.

The problem of lighting was almost certainly the single most important determining factor affecting museum design.

Natural light was considered the most appropriate and necessary source of light for all buildings even after the widespread introduction of gas lighting in the second quarter of the nineteenth century, and electric lighting at the beginning of the twentieth century. Prior to the development of artificial lighting the most formative influence on architecture was the architects solution to the crucial problem of providing adequate light to interiors.

What constituted the best method of admitting natural light into museums and galleries was one of the architects central concerns,

and it was an issue that was written about and discussed widely. Architects were judged on how well, or poorly they had dealt with the problem. The following quote gives some indication of the sort of problems that had to be overcome in illuminating a public gallery. It is a letter from Sir Charles Eastlake to Sir Robert Peel concerning the National Gallery, London:

The fittest place for the windows, whether in the roof or in the wall, is a question on which much difference of opinion exists. Some are inclined to think that a skylight (always supposed to be furnished with ground glass, or with moveable blinds) is desirable for all pictures. This seems to have been Rubens's opinion, for Algarotti states that the museum which the great painter built for himself at Antwerp was circular, with a single light in the centre of the roof ... Indeed, in a climate like this, and with the effects, moreover, of smoke to contend with there should always be a superabundance of light, and whatever has been deemed necessary in this respect in the best lighted continental galleries should be rather exaggerated in London. (11)

Although this letter concerns a picture gallery rather than a museum it raises some of the most important issues concerning the illumination of the buildings discussed here.

Seasonal changes in the number and quality of daylight hours obviously had a profound effect on public accessibility. The Old Hunterian, Glasgow kept detailed records of the numbers of visitors to the museum between 1808 and 1870 (12). These show that, between 1810 and 1820, there was an average of 473 visitors to the museum during the month of July. During the same

decade the monthly average for January shows a drop in visitor numbers to 246. There are obviously many factors that explain this seasonal variation such as the effect on visitor figures of inclement weather during the winter months. One of the most important factors, however, must have been due to restricted opening hours, and the poor quality of light on dark winter days when visibility would have been extremely poor.

The problem of providing adequate natural lighting was made difficult by these seasonal fluctuations, but even during the summer the architect could not necessarily rely on a sufficient or uniform amount of natural light. The problem of how best to provide sufficient illumination to museums was not easily resolved. Unlike in picture galleries where everything was wall mounted, museum objects were displayed in cases around the walls, but also in free-standing furniture which itself obstructs light and causes shadow. The deeper the room the harder it was for light to penetrate, but increasing the quantity and size of windows meant that there was less wall space for the display of objects. Furthermore, on bright, sunny days the glare from direct sunlight would have actually had a negative effect on the visitor's ability to see objects in glass cases.

The use of top lighting was universally accepted as the solution to this problem, and was widely used in galleries and museums. This usually took the form of lantern or pitched roof lights beneath which there were lay-lights of ground glass which diffused the sun's rays to provide an even, top illumination. This method was generally considered more advantageous than side lighting because fewer and smaller windows were required. This

was of benefit in reducing the amount of light shining directly into the eyes of the spectator, and it meant a greater proportion of wall space could be devoted to display. It had the further advantage of allowing much deeper and taller museums, which was of vital importance for the display of zoological collections which often had extremely large specimens. The inclusion of a mezzanine in these very tall museum halls meant the space was maximised, whilst allowing of the display of, for example, elephant skeletons which were usually placed on the floor, or whale skeletons which were suspended from the components of the roof.

Contemporary commentators on the subject further endorsed the need for top light to be used only in conjunction with a very high ceiling in museums and galleries because it reduced the chance of reflected light obscuring the object being viewed. High ceilings also provided a large amount of reflective space which would allow lateral light to penetrate the interior. However, very high ceilings were criticised because, where the space was lit principally from top light, there was an insufficiency of light for viewing objects placed on the lower floor of the museum.

The question of how best to light museums and galleries became a veritable science. It was much discussed and formed the basis of a number of lectures and newspaper articles during the mid nineteenth century. Speaking in 1857 to an audience at the Brompton Museum, Mr Redgrave, a member of the Royal Academy observed:

... there is another condition to which it is necessary to

refer in galleries which, like the Sheepshank Gallery, are lighted from the top (the most usual method, from the much greater hanging space obtained). One of the first requisites is sufficiency of light, but as the simplest way to remedy the evil of reflection is to diminish the size of the opening for the admission of light, and raise the roof, this expedient is often resorted to (the more that it accords well with the grandiose views of the architect). It thus happens that in shunning one evil we fall into another: by raising the roof, it is true that the place of the reflection is raised above the usual hanging line of the pictures, but, alas! they are as in a well where but few rays of light can penetrate. (13)

In practice, architects rarely relied solely on top lighting but employed both roof lights and windows in an attempt to satisfy the various criteria required of a museum hall. Windows could not be dispensed with entirely for practical and aesthetic reasons. In a very tall museum side light would be needed beneath the gallery, even if it was only of very modest dimensions. The only examples of Scottish university museums which are lit from roof lights alone are the Zoology Museums at Edinburgh and Glasgow. At the Glasgow museum the ceiling was very low, and there was no mezzanine so that light levels would have been sufficient. In choosing to omit windows, however, the facade of Burnet's museum was blind and rather ugly. It would seem that for the sake of the external appearance of the building alone it would have usually been considered important to include some windows.

The widespread introduction of artificial lighting in public buildings no doubt alleviated the problem of poor lighting to

some extent, although museums designed towards the end of the nineteenth century were still provided with large quantities of glass relative to solid masonry. For whatever reasons, the availability of artificial light had very little effect on university museum design.

Conservation issues were not a priority for the architects of these museums. The harmful effects to museum objects of direct sunlight were known about although there was probably no very great understanding of just how damaging this was in the long term. As a consequence of this ignorance there were few attempts to deal with the problem. The most important requirement was that of making the object visible, and all other aspects of museum design were subjugated to this. Some concessions were made with the fitting of blinds to the windows of some public galleries, but there are few examples of the same consideration being shown in university museums. Notable exceptions to this are seen at the Zoology Museums of the Universities of Edinburgh and Glasgow. At Edinburgh, Lorimer and Matthew commissioned special glass which excluded ultra-violet light, and at Glasgow deep grilles were fitted above the lay lights in order to help protect the museum collections from light damage.

The style and arrangement of furniture in university museums is also quite distinctive. All available wall space was fitted with glass-fronted exhibition cases. Since museums often acted as a venue for both storage and display, the lower part comprised drawers or cupboards, and the upper portion was glazed for display.

Cases fitted below the gallery tended to be quite deep, often

occupying all of the space beneath the gallery if it was a narrow one. Fitted cases around the walls above the gallery were usually much shallower, although it relates directly to the width of the gallery. A few of the Scottish university museums, like the New Hunterian, Glasgow, had substantial galleries which were wide enough to accommodate free-standing table cases.

Cases were frequently placed at right-angles to the walls between the windows to form carrels. This arrangement meant that the cases were well lit, and the space was conveniently sub-divided. The ability of a curator to present objects in meaningful groups, according to a particular system or hierarchy, was essential to the presentation of the majority of natural history collections. A carrel arrangement allowed the collection to be sub-divided so that specimens illustrating, for example, a particular family, genus, or species could be placed together and separated from other objects. It was a way of controlling the way in which visitors encountered the objects in the museum, and could be used to introduce and reinforce ideas and theories in the simplest possible way.

Michael Brawne, in his book *The Museum Interior*, maintains that the term 'Museum' does not describe a particular kind of space organisation, and that "... an absence of architectural determinism seems to be especially obvious in the case of Museums." (14). While this may be a very general truth as regards all types of museums, it is not applicable to university museums. These museums held very similar types of natural history collections and are a readily identifiable architectural group. They had well defined and characteristic attributes which can be

associated with specific uses and users. The well established spatial arrangement of the university museum is seen also in English universities and was adopted by architects designing public museums in Scotland.

UNIVERSITY MUSEUMS AND THE CHANGING NATURE OF UNIVERSITY
EDUCATION

During the course of this research certain patterns in the building and maintenance of university museums in Scotland have become apparent. The fortunes of these facilities, between their inception and the present day, have some link to the changing attitude toward the role of natural history collections. It also seems to be related to developments in teaching practice.

In the early nineteenth century the new buildings at the educational establishments of Aberdeen University (1834), Edinburgh University (1816), Royal College of Surgeons (1829), Glasgow University (Stark 1803, Baird 1846 & 1847, Scott 1866), Anderson's University (1830), and St. Andrews University (1849) all had large and lavish accommodation for their collections. These were general museums that held all of the university's collections under one roof.

Toward the end of the nineteenth, and into the twentieth century, after a period of decline, there was a second wave of museum building occasioned by a general period of university expansion, and a resurgence of interest in university teaching, and research collections. This period witnessed the foundation of a large number of smaller, more specialised museums.

At Edinburgh and Glasgow these were incorporated into new, free-standing, departmental buildings that were erected during major expansion projects (Burnet 1900 - 1923, Lorimer, 1927 - 1930). Aberdeen University increased its provision for museum collections in a number of smaller class museums which coincided

with a general period of growth. They were all built at the same time and incorporated into one significant extension to the original college scheme in the 1890s. University College, Dundee was only established in the 1880s but the building of accommodation for teaching during the next two decades included museums for chemistry, dyeing and bleaching (c.1888), zoology (1892), botany (1892), medicine (1901) and geology (c.1904)

St. Andrews University also undertook the building of the Bell Pettigrew in 1908. This was slightly different because the collection moved en masse from United College, and the original museum space was used for a different function. Despite this it still conforms to the general pattern of university museum building in Scotland: the new museum in St. Mary's was significantly larger, and collections relevant to the teaching of agriculture, chemistry and medicine were moved to specialised class rooms. Similarly, when the Veterinary College at Edinburgh moved to Summerhall (1913) it was provided with a large general museum and two further class museums for biology and *materia medica*.

At Edinburgh and Glasgow universities these periods of expansion, which included the establishment of departmental, purpose-built museums, follow a period of severe neglect of the university's collections. In both cases the establishment of new departments and the inclusion of accommodation for the relevant collections came about as a result of the concern, initiative and dedication of certain individuals. Contemporary reports on the state of the collections at the New Hunterian, Glasgow and Natural History Museum, Edinburgh reveal severe neglect of

specimens that resulted in the erection of the museums designed by Burnet at Glasgow, and those at Edinburgh by Lorimer.

This trend is interesting in view of the research done by Charles Waterston on the changing nature of University teaching, and the decline of the museums of the Royal Society of Edinburgh and the University of Edinburgh. In his book 'Collections in Context', Waterston identifies a link between the gradual decline and de-accessioning of the collections of these two institutions, the rise of the National Museum of Scotland, and changes in teaching practice throughout the nineteenth century (15).

Waterston maintains that the move away from the Baconian Inductive method of teaching, towards the Newtonian Deductive method changed the way in which collections of natural history specimens were viewed and used. Coupled with this were advances in science that radically undermined the place of hand-held museum specimens, and which resulted in university resources being re-channelled into other areas (16).

The Baconian method of science was inductive and demanded the observation of large numbers of objects in order to discover connecting principles. The Newtonian method of science was deductive and proceeded from agreed first principles to facts. The latter involves creating hypotheses and testing them to see to what extent they are viable. One works forward from observed fact, the other backward from a premise (17).

During the early part of the nineteenth century the Inductive method of enquiry was the most popular and dominant. This was threatened, and eventually superceded by the Deductive method. The way in which collections were arranged and housed seems to

reflect this.

In Edinburgh, Glasgow and Aberdeen the early museums at the universities were large museum halls in which specimens illustrative of every aspect of science were housed. These were arranged in a formal way which described the hierarchy of the plant and animal kingdoms according to the system invented by Linnaeus. Although it would have been a virtual impossibility these museums would, ideally, contain one example of every natural phenomenon.

The kind of museum required by an institution that approved the Deductive method was quite different. A science that is based on speculation and theory tends to favour experimentation over observation. As teaching shifted from the didactic toward research, the importance of the museum declined. In its place more space was given over to house research laboratories. Waterston asserts that this shift, coupled with the rise of subjects that involved the use of the microscope, meant the negation of the hand-held, macro object from the mid eighteenth century onwards.

Waterston's argument would tend to suggest the complete decline in university provision for museum collections. However, the evidence does not wholly support this. It is true to say that a large number of collections suffered severe neglect at one point or another throughout the period he identifies but this is often followed by a renewed interest in the collection, and the erection of a number of specialised museums. It is also the case that a lot of purpose-built museums were closed or radically altered so that the provision of space for the collection was

reduced. However, this is usually coupled with the erection of new museums which, although smaller and vastly simplified in design, were more numerous. Furthermore, the late eighteenth and early twentieth centuries saw the erection of museums, like those of Burnet, which were in fact quite large and spacious. It was also a period when completely new museums, like those of University College, Dundee, were being established.

The period which Waterston describes as being one in which the university museum was being eclipsed by the increase in public municipal museums and, in particular, the establishment of a National Museum (1861), was in fact one in which large numbers of university museums were being built.

This research has shown that changes in teaching practice and the rise of the municipal museum did affect the university museum but did not force it to become obsolete. They were still considered essential to the work of the university, and were established in large numbers. However, it is apparent that, in many cases, the style, size and position of the museum changed. Museums like those by Lorimer for the University of Edinburgh, or Marshall Mackenzie's class museums at Marischal College, or Gillespie and Scott's museum for the Bute Medical School show a vastly more simplified sort of design. They are also characterised by being placed in more private parts of the college. Instead of occupying positions in the most public and prominent part of the college or department, they are only reached after negotiating a network of doors, stairs and corridors. The same can also be said of some of those late nineteenth century museums that are large and decorative, and

which conform to a more typical idea of this architectural typology. Museums like those of Roberston and Findlay at Dundee University Medical School, Burnet at the Glasgow University Department of Zoology, and Robertson's for the Zoology Department, University of Dundee, are quite traditional examples in terms of style, yet they were all placed in quite obscure, inaccessible parts of the college.

What this would tend to suggest is that there was a shift in attitude toward the university museum. Whereas they were considered public property during the first half of the nineteenth century, they were now seen as a private space to be used only by students or academics of the educational institute.

Truly public museums were being created throughout Britain as a result of the *Museums Act* (1845) and the *Public Museums and Libraries Act* (1850). This legislation allowed local boroughs to spend part of their budgets on the creation of municipal museums. These allowed and encouraged the establishment of municipal museums for the use of the general public, although it was not until the 1867 *Public Libraries (Scotland) Act* that such legislation had much of an effect north of the border. This act named local authorities that were permitted to use rates to establish libraries and museums (18).

It is possible that, as a result of these parliamentary acts, there was no longer an obligation for universities to cater to the general public. Certain university museums were no longer viewed as a recreational facility for the entertainment of the uneducated but as a venue for serious academic enquiry and research. Its move from the public to private realm in this

instance is emphasised architecturally in three ways. In its reduced scale, architectural simplicity and remote positioning.

The large museums of the University of Edinburgh, Royal College of Surgeons, Anderson's University, University of Edinburgh Medical School and University of Glasgow all suffered complete closure or a drastic loss of space during periods of rationalisation. On the whole this did not occur until much later on in the twentieth century and coincided with a general trend that affected all university museums including those built between the mid-nineteenth century and the 1930s. At the time of writing only a handful of museum spaces remain in anything like their original state. Only those of the Hunterian, Royal College of Surgeons, Reid School of Music, St. Andrews Medical School, Anatomy and Zoology Departments, Glasgow, and the Zoology Department, Edinburgh still function as museums and retain anything of their former character.

THE UNIVERSITY MUSEUM AND LIBRARY

Museums cannot be too numerous or extensive. Without museums the profession would be in the state of man without a language.

Knox 'The Anatomist's Instructor and Museum Companion' (19)

All teaching and research was dependent on the resources of the library and museum which were essential to every aspect of its function and aims. The fact that the life of an educational establishment was centred around the information held within the library and museum is reflected in the way in which colleges were designed around them.

What is interesting about these two spaces, and what has been highlighted by this research, is the close proximity of library and museum, and the similarity with which the two were treated in early nineteenth century examples. Those responsible for the design approached them as resources that were alike in all aspects, because fundamental to both spaces was the discourse of rationality, order and reason. They were repositories of all things known, defined and understood. In the older, unspecialised, large museums in the colleges at Aberdeen, Edinburgh and Glasgow we can see collections whose form and arrangement is controlled by the Baconian Inductive method of Science. They are large halls which aimed to hold categorised objects illustrative of every aspect of the natural world; a sort of 'ark' in which the whole world could be contained in a concentrated form in a single room. The library was, similarly, a

large hall that held books which contained the totality of human knowledge of the objects kept within the museum. One was a library of natural phenomena and the other was a library of words detailing these phenomena. In his address to the Royal Physical Society in 1849, Professor Flemming urges the foundation of a National Museum by arguing that "There is no want more generally felt among students of this important branch of natural science than that of the sort of *dictionary* of specimens which a well-arranged and correctly labelled [sic.] collection of the kind would form." (20).

The importance of the physical presence of the object, upon which facts were based, should not be underestimated. In an age when scientifically proven facts were still very new it was as important to be able to access the evidence upon which these were based, as it was to read the 'truths' of scientists found within the library.

Throughout the nineteenth and twentieth centuries in Scotland provision for libraries and museums dominates new college schemes. Primary source documents for all of the buildings covered in this work attest this fact. Both library and museum commanded a disproportionately large amount of the space and finances. The status of these spaces is further indicated in their physical location on the principal floors, in the most prominent and public part of the college. The three rooms for museum, library and great hall (for examinations and formal functions) were considered the most important spaces within any new scheme, and the style, size and position of these three were frequently the only specific stipulations in a building

committee's remit to the architect. When mentioned, the accommodation for classrooms, laboratories, private rooms etc. was frequently vague and often dealt with later on in the planning process.

There are numerous examples that could be used to illustrate this. The most obvious are those built in the grand, new college schemes of the first half of the nineteenth century.

In 1836 the *Aberdeen Journal* published a description of Archibald Simpson's accepted design for Marischal College. The article stipulates that there would be provision for classrooms, a laboratory and teaching rooms for the professors of anatomy and surgery, but it is quite specific about the nature of space for "The Public Hall, Museum and Library [which] will be spacious rooms planned with a view both to convenience and to architectural effect. The approach to these rooms will be by a grand staircase contained in a tower ..." (21).

Principal Robertson's vision for Edinburgh University's New College buildings is recorded in his *Memorial* of 1767 in which he states that:

The chief object in view is to erect those public buildings which are necessary for an University; a Public Hall, a Library, a Museum, and convenient Teaching Rooms for the several Professors. (22)

In Senate Minutes of the following year more specific details are given of the dimensions required by each of the three 'public Schools' which are the Common Hall, 80 x 40 ft.; the Museum, 90 x 30 ft.; the Library, 100 x 40 ft.; and a Senate Room, 20 x 20 ft. (23). The same minutes do record the need for provision to be

made for the various 'private Schools', and in some cases it is quite well defined. However, there is clearly a distinction drawn between the 'public Schools' which take priority, and the 'private Schools' which are not given the same importance.

The prime motive in the decision to rebuild the colleges for the educational establishments covered in this study was, in the majority of cases, due to the desire to provide their museum and library collections with better accommodation. The criteria for 'better' being more prestigious, spacious and purpose-built.

That the museum and library, together with the examination/ceremonial hall, should be treated in this way is easy enough to understand. They were considered public spaces and were employed as a form of status symbol that declared an institution's wealth, status and academic prowess.

The museum in particular was made freely accessible to the general public. Although an entrance fee was usually charged every effort was made to ensure the universities' collections were a public resource. In his history of the Hunterian Museum, David Murray writes that "The Museum was regarded with pride by the professor, who felt that the possession of such magnificent collections conferred distinction upon the University and this feeling was shared by the citizens of Glasgow, who looked upon the museum as a notable ornament of the city." (24). Similar commentaries exist for the museums of St. Andrews University, the Henderson's Trust, the Department of Zoology, Glasgow University, the museum of the Marine Biological Station, Millport Haven. They all agree in considering the university museum to be an important asset to the university and the city as a whole.

In a large number of cases, the museum is placed in the vicinity of the library and the architect has frequently arrived at a very similar solution in providing accommodation for rooms with apparently different functions. Although designed for different uses and users the libraries and museums of Scottish universities are comparable in terms of positioning, style, dimensions, lighting and arrangement of space.

There are a number of examples in which the library and museum are conceived as symmetrically arranged, paired spaces occupying similar or identical rooms. This can be seen at Simpson's Marischal College, Aberdeen, and at Scott's Glasgow University. The architects have designed the library and museum as complimentary spaces in which either collection could have been placed. In each case they are galleried halls of the same dimensions placed on the principal floor, and are entered from doors that stand opposite each other across a hallway.

Furthermore, at both Aberdeen and Glasgow the great hall radiated from the same entrance hall so that all three spaces describe a 'T' shape (25). This particular arrangement is seen also at University College, London, the drawings for which had been published in 1826. Designed by William Wilkins (1778 - 1839), the College was a bold Greek Revival venture. On the principal floor an octagonal vestibule serviced the library and museum to the east and west, and the great hall to the north. Whether Wilkins or Simpson should be credited with this arrangement is open to some conjecture. Wilkins' plans pre-date Simpson's final design, but the Aberdonian had produced a scheme for Marischal College in 1825.

In other college schemes the library and museum have been provided with very similar apartments in the same block, on the ground and first floor, which share the same dimensions, arrangement of space and architectural features. Robert Adam's original design for Edinburgh University's New College placed the library above the museum in a set of rooms that are remarkably similar. In all three of Baird's unexecuted plans for Glasgow University the library and museum were provided with galleried halls of exactly the same dimensions, and with the same division of space into carrels. The Henderson's Trust Phrenology Museum and the Andersonian Museum were both situated in rooms above the library. The floor space of both was the same although the latter did not have a galleried library, which the museum did. Staircases led from one to the other so that the users of both facilities had easy and direct access. At the Andersonian the ground floor ceiling had been removed during the course of the nineteenth century thus making the relationship between the two, on a visual level, even closer.

During the first part of the nineteenth century the museum and library were often housed together in the same group of apartments in which either one appears as a subsidiary and supporting facility to the other. This can be seen at the Reid School of Music, The Phrenology Society's Museum, The Old Hunterian, and at the later Marine Biological Station, Millport. Externally, the elevations show no change in the difference of function, whilst internally there is a subdivision of the space into library and museum.

Museums in departmental buildings of the later nineteenth and

early twentieth centuries do not conform to this pattern in quite the same way. Burnet's three departmental buildings for the University of Glasgow all contain museums which are vast and proportionately larger than even the huge, galleried nineteenth century natural history museum halls of Aberdeen, Edinburgh and Glasgow Universities. Only the department of zoology had a library and this was just a small rectangular room of no particular architectural merit, situated on the first floor. During the process of university expansion, library collections remained together in a central location whilst museum collections were dispersed into a number of departmental sub-museums. Even at the zoology department where there was a class library, it has no real relationship with the museum and is very different in terms of its physical space, design and style. By this time it is clearly no longer a necessity for the two to be in close proximity.

All three of Lorimer and Matthew's departmental buildings on the King's Buildings site had libraries. In the zoology building this was on the opposite side of the building to the museum, and in very different accommodation. It is not known exactly what form the apartments for the museum and library took at the animal genetics research department but they were placed on the same floor either side of the main lecture hall. The collections of the museum and library of the geology department were housed in the same position, in virtually identical rooms, on the first floor of the east and west wings.

These later twentieth century examples show a change in approach to museum and library design in terms of how the two inter-

relate. In the majority of examples the relationship between the library and museum was not as close as it had been, and the treatment of the two spaces was quite different. However, in a number of examples it can be seen that certain nineteenth century notions of the placing, relationship and treatment of the two spaces persisted.

It is difficult to ascertain to what extent this is a deliberate decision or an accident of tradition. It is possible that, where the museum and library enjoy a close relationship in comparable apartments, the architect is following an accepted norm of the traditional design for these two types of spaces.

ARCHAEOLOGICAL MUSEUM, KING'S COLLEGE, UNIVERSITY OF ABERDEEN

John Gregory, a 'mediciner' and lecturer in the arts at King's during the middle of the eighteenth century, is the first person to have shown any interest in setting up a museum at the university. He established some sort of 'cabinet' of natural history at the college which housed 'Models of the most useful and curious instruments and machines, ancient and modern.' (26). This collection must have been temporarily housed in seconded space until a suitable purpose-built space could be provided. Even at this early stage in the history of the collection, it was the intention of those concerned that it should be housed in appropriate accommodation:

Though the furnishing of these apartments in any degree of perfection would be a work of time, the senatus declared that they had been encouraged to begin "in hopes that time and opportunity may favour a public design ... And they hope that their alumni, in different parts of the world, and others who wish well to this University and the improvement of natural knowledge, will contribute some proper furniture for such apartments, and be assistant in such a way as they see most proper for promoting so good a design. (27)

Although known latterly as the archaeology museum, it was initially a general museum of natural history. Following the Union of King's and Marischal in 1860, the natural history collection moved to Marischal. Objects pertaining to local and foreign antiquities remained, and the museum was thereafter known as the archaeological museum.

Aberdeen's city architect, John Smith, was responsible for the early nineteenth century extensions to King's College (28). Built between 1822 and 1825, they comprised the museum on the west side of King's Quad, and the reconstruction of the Cromwell Tower at the north east corner (29) (Figs. 1 & 2). These replaced existing college buildings which were in a severe state of decay, and which could no longer fulfil the function for which they had been built. The galleried museum occupied a greater part of the first floor of the southern-most section of the west front in a 25 x 45 ft. space.

The new range was built in a simple English Tudor collegiate gothic style with large external buttresses and a crenellated parapet. There were three windows to the museum on the west side, and one each to the south and east sides.

The entire project cost £7,000, of which £2,000 came from the Privy Purse, and £5,000 from public subscription (30).

MARISCHAL MUSEUM, MARISCHAL COLLEGE, UNIVERSITY OF ABERDEEN

During the early nineteenth century Marischal College, like King's, possessed collections of curiosities donated by graduates. It included objects relating to natural history, anthropology and archaeology. After 1860 the natural history collection of King's College was moved to Marischal College and, in 1907, the remaining local and foreign antiquities were combined with the Marischal collection and removed to the Broad Street premises.

A report of 1798 on the state of Marischal College (c.1676 - 1739) stated that the building was "... ill-designed, irregular, inelegant and unsuited to fulfil its function" (31). As a result of this report it was decided in 1824 that a new building be erected to accommodate the college, and that surveys and plans were to be obtained from two architects. Proposals were duly submitted by Aberdonian architects John Smith and Archibald Simpson, both of whom condemned the old college and suggested complete rebuilding. Shortly afterwards Smith declined to participate any further in the competition, leaving Simpson the sole architect involved in the project. The remit was thus: "That the new buildings should be in insulated portions; the classrooms to be separated from the central building containing the Great Hall and Library; the medical classes to be still more insulated. The architecture Grecian, presenting one storey throughout, to accompany an Ionic portico; but in the interior divisible, where necessary, into two storeys, the upper one to be lighted from above." (32). The building of the new Marischal College was to be

funded by the Treasury and by public subscription. Simpson drew up plans in 1825 which were subsequently destroyed by fire and of which no records survive.

Although it is impossible to be absolutely certain without Simpsons' plans to consult, it would appear that the guidelines given to the architect did not make provision for residential accommodation. This was a feature of Continental college design. Prior to 1825 all British college schemes at Oxford, Cambridge, King's College, Aberdeen and Glasgow provided extensive domestic quarters for staff and students. William Wilkins (1778 - 1839) had designed University College, London (1826) (Figs.99, 100 & 101) along Continental lines, and is usually credited with introducing these ideas to Britain (33). Wilkins' College makes provision only for museum, library, great hall and classrooms, but it may be that he was in fact influenced by Simpson's 1825 drawings rather than by any continental example. Although very different in design, it is also worth noting that Edinburgh University had also decided to dispense with staff accommodation within the New College. The small court of the original Adam scheme (1789) (Figs. 9 & 10) was allocated for Professor's houses, but by 1816 the architects involved in the competition were requested to submit proposals for a scheme that did not include domestic accommodation (34).

No progress was made with the building of Marischal College until 1834 because of an on-going legal argument about the viability of Marischal College merging with King's. In 1834 the King's Architect for Scotland, Robert Reid (1774 - 1856), drew up new plans and was subsequently taken off the project. In the same

year Archibald Simpson submitted his revised plans in which he abandoned the Classical in favour of the Gothic. By 1836 no steps had been taken to start construction of the new building because of the continued internecine inter-college bickering over the union until finally, in January 1836, one of Archibald Simpson's two revised plans for the college was accepted. The plan chosen was a greatly simplified revision of the 1834 proposal (35) (Figs. 3, 4 & 5). It was 'Collegiate Gothick' chosen over the Classical because "The Grecian front and portico of 1825 [were] obliged to be given up as too costly." (36).

This Tudor Gothic style building was started in 1836 using Rubislaw granite and sandstone and built on the same site as the seventeenth century edifice. The front facade, to the west, faced onto Broad Street and enclosed a courtyard on three sides. The central block, which encompassed the Mitchell Tower, housed the museum, library and Great Hall. Although there was one main museum space the building housed numerous 'class' and 'laboratory' museums for anatomy, anthropology, geology, medical jurisprudence, *materia medica*, midwifery and surgery. The great hall, library and museum on the principal floor formed a 'T' shape.

The natural history museum and library were paired first floor spaces occupying rooms on either side of the staircase to the west of the college. The museum which was set to the south has lost all of its original internal character in an insensitive and entirely inappropriate phase of modernisation in the 1980s. Whilst the museum has been ruined, the library, which was an identical space to the north side of the stairwell, has remained

intact so that it is still possible to get an idea of its internal arrangement, furnishings and general impact as a space. There was no staircase offering a direct link between the principal and gallery floors. A spiral staircase, in a subsidiary museum to the west, linked the two floors in a rather obtuse way. Exhibits were displayed in fitted cases on the principal floor of the museum along all four sides. These cases ran the full height and depth of the mezzanine. Objects were also exhibited on the floor above in glass table-top cases affixed to the gallery balustrade. The mezzanine was too narrow to allow of either fitted or free-standing display cases.

The museum was lit from windows at the gallery level to the north, east and west. The windows to the west overlooked the one-storey cloister in the courtyard. Professor David Walker believes that the interiors of both the library and museum were inspired by Smith's archaeological museum at King's College (37).

Although the college was finished in 1844, the museum was not fitted out until 1845. Damage to the college, as a result of a fire in the surgery museum, was repaired by Simpson. At the same time he was consulted over the completion of the main museum. Simpson estimated it would cost £1,000 including construction of the gallery, presses and furniture. The treasury were approached for a grant, but they declined. Exactly where the money came from is not known although the city donated £100 with the proviso that it would be accessible to the public free of charge on Saturdays (38).

Starting in 1891, and taking almost a decade, Alexander Marshall Mackenzie doubled the size of Marischal (Figs.6, 7 & 8). He

extended the college to the east, widened and lengthened the north and south wings, and increased the height of the Mitchell Tower by 80 ft. This enormous increase in the size of the college was used to provide another 10 museum spaces for the subjects of agriculture (2), anatomy, botany, chemistry, materia medica (3), medicine, pathology. This brought the total number of purpose-built museum spaces to a staggering eighteen. Simpson's great hall was converted into a picture gallery and a graduation hall was provided in the western extension.

Two of these additional museums, those for botany and materia medica, are quite interesting spaces. The botanical museum was situated on the ground floor to the north of Simpson's north wing. It measured 50 x 30 ft., and the only point of access was through the department's lecture theatre. A centrally-placed stair to the south gave access from the principal floor to the gallery which ran around all four sides. The plans show that there were no windows, so it must be assumed that the museum was top-lit.

The materia medica museum was also on the ground floor, but to the south of Simpson's south wing. Like the botany museum it was quite private, and could only be entered through the department's advanced laboratory or the practical classroom. It was a 25 x 25 ft. room with a gallery on three sides. The gallery was accessed from the principal floor in a similar fashion to the botany museum via a centrally placed flying stair on the north side. It was side-lit from three windows to the south.

THE NATURAL HISTORY MUSEUM, UNIVERSITY OF EDINBURGH

The University of Edinburgh museum has a particularly complicated history dating back to the mid-seventeenth century, and is related to the foundation of the Royal College of Surgeons' Museum (39). In 1642 the collections were housed in the library at the west end of the Old College grounds. The Old College was located on the same site as the present-day one and was divided into three courts. After the library was moved in 1767 the museum occupied the entire lower hall of the library building, and the upper floors were used to teach science subjects. At about the same time (1765) a museum was requested for the medical school which was connected to the university since a "Museum or repository for natural curiosities would tend greatly to complete the plan of Medical Education" (40).

Following the appointment of Professor Robertson Principal of the University in 1762, a project to rebuild the college was begun. Robertson was at the forefront of the movement that sought to "... [rebuild] the College in a decent and proper manner ..." (41), and he petitioned and argued his case continuously whilst Principal of the University. Such an ambitious project was not within the resources of Edinburgh Town Council so the necessary funds were raised through public subscription both north and south of the border. Edinburgh University was an unusual institution in that it was set up and run by the Town. Aberdeen, Glasgow and St. Andrews were pre-Reformation foundations and were independent of the Town Council. The building of the New College was set in motion with a public letter pleading for funds in

1768. This talks of the need to erect "...those public buildings which are necessary for an University; a Public Hall, a Library, a Museum..." (42).

Senate Minutes of March 1768 detail more specifically the sort of accommodation envisaged for the public and private schools. The dimensions of the apartments for the three 'public schools' are listed as: 80 x 40 ft. for the common hall; 90 x 30 ft. for the museum; and 100 x 40 ft. for the library (43).

Exactly how Robert Adam came to be commissioned to design the New College is uncertain. There does not seem to have been a formal competition and Adam was involved right from the beginning. The fact that Adam was related to the principle through his mother, and that he was the architect originally commissioned for the related South Bridge development probably helps to explain his appointment (44).

Robert Adam's work on the University building was finally started in 1789, and was to completely rebuild the college on its existing site while teaching continued. Adam died in 1792, just three years into the project with only the north west corner completed. However, the detailed plans he produced enabled the building to be continued under Playfair in a way which allowed the designs of the two architects to be combined into one uniform structure.

In Adam's original 1789 plans the college comprised two courts: the Great Court to the west and a smaller First Court to the east in which the majority of the space was given over to houses for the professors (Figs. 9 & 10). In this early scheme the museum occupied an enfilade of apartments on the principal storey on the

south side which ran from the First Court to the Great Court. It comprised a round room from which radiated two museum halls to the east and west, and a classroom to the north. It was side-lit from south-facing windows. Above the museum and natural history classroom was the library which had a similar enfilade arrangement of rooms. The library was also side-lit from windows to the exterior and courtyard. The Great Hall, which rose through two floors, was placed in the west end on the principal storey.

Adam died in 1792. Although work continued after his death under James Adam, Robert's younger brother, progress was slow. During the course of 1794, the year in which James Adam also died, work ceased completely. From the very beginning there had always been financial constraints on the project, and by 1794 the building fund was exhausted.

When the university was once again in a position to consider continuing with the construction of the college in 1807, Adam's plans had been abandoned. The university had no hope of being able to raise the necessary funds to complete the college according to the designs of Adam. Adam's two courts, and the expense of the south elevation, were outwith the budget.

Robert Reid, King's Architect, was asked to submit plans for a financially viable scheme in 1808. Reid produced a design in 1810 which was based on Adam's. He made considerable modifications in omitting the south side and combining the two courtyards into one. The museum and library were placed in adjoining apartments on the second floor of the east range, above the entrance. Despite the wide approval with which Reid's proposal was met, it was decided in 1815 to invite other architects to enter into a

competition to produce designs for the college. It may, in part, have been due to the delay caused whilst the Town Council petitioned the Treasury for the money to finance the building.

For whatever reason Reid's plans were not used and the competition was advertised in 1815 (45). During the course of this year the Senatus issued a report detailing the actual accommodation required by the university. This was sent to all the architects involved in the competition. Between the cessation of work in 1794 and 1815 the requirements of the college had changed considerably. The university's collection of natural history specimens was to be provided with two 90 x 30 ft. halls, a great deal more than was thought necessary in the 1790s. It was advised that in designing the museum the architect should consult closely with the curator, Professor Robert Jameson.

Ten prominent Scottish architects submitted designs and the competition was judged in 1816. Each architect submitted two sets of plans. The second set was necessary as a result of the Trustees changing their minds and deciding that the scheme should be based around a single courtyard. William Henry Playfair was declared winner during the same year.

Work was resumed in 1816. Playfair's designs made fundamental changes whilst preserving the overall theme of Adam's plans and incorporating the existing 1789 - 1792 buildings. Playfair proposed rearranging the two small courtyards of Adam's scheme into one large one, as suggested by the Senatus (Figs. 11 & 12). The museum was relocated and placed in the west wing on the ground and principal floors which Adam had set aside for the Great Hall. Placed thus the museum enjoyed the most prominent

location in the college.

Playfair's design was finally approved and accepted by the Senate because it granted the collection the most prestigious and central place in the college. He rearranged the space so that the great hall and chapel were placed in rooms originally set aside for the library. Playfair's design was also heavily supported by Jameson, Professor of Natural History, and Alexander Munro, anatomy lecturer, who both appear to have been quite influential characters in the university.

Work started in 1817 and in the same year George III granted a general order for the collection of natural history objects for the museum. This was largely due to the insistence of Jameson, the driving force behind the collection and its growth.

The museum as completed was similar to Adam's Great Hall externally although internally it was quite different. Playfair's design was faithful to the original in its elevations where Roman Neo-Classical is continued without interruption. The east elevation comprised five bays; three bays in the centre and end pavilions of one bay each. The facade was typically Adamesque in decoration with rusticated stone work on the ground floor, and paired Corinthian columns and pilasters, and Venetian windows on the first floor. Playfair retained Adam's ground floor 'piazza' entrance from the courtyard.

The museum constituted two halls; a lower museum on the ground floor (Fig. 15), and a tall, galleried upper museum (Fig. 14) above this on the first floor. The upper floor was the principal space of the museum. It had a gallery around all four sides which ran behind the anta pilasters supporting the segmental arches

which bore the ceilings. The space behind these pilasters on the principal floor contained niche display cases. To the north and south ends there were screens of distyle in antis Ionic columns which separated the three bays devoted to the museum from the two bays which were occupied by staircases that allowed access to the gallery. To each of the three bays there were Venetian windows along the west side. The upper, lunette part of these windows was not glazed because Playfair had decided to leave the gallery blind. Two 'cabinet' corridor galleries ran down the length of the upper museum above the piazza on both the principal and gallery levels. In Adam's design this had been a balcony but Playfair clearly thought that it would be best utilised as display space for the museum. Three staircases from the main floor of the museum led to the mezzanine. Doors from the east side of the principal floor and mezzanine allowed access to the cabinet museum rooms, and doors at the north end of both cabinets opened onto the staircase to the north of the piazza.

The three Venetian windows on the west side of the principal floor provided the only side light. The mezzanine level was blind on all four sides to provide as much space as possible for continuous display cases. Three conical skylights, the central one crowning a dome, corresponding to the three bays of the museum, admitted top-light (Fig. 17). In Playfair's competition drawings the skylights to the north and south were depicted as rectangular lanterns (Fig. 16). The corridor cabinets were lit on the principal floor from Venetian windows over-looking the courtyard, and on the mezzanine level from skylights.

Specimens were displayed in continuous glass-fronted wall cases

around the walls above and beneath the gallery. The cabinetmaker William Trotter was commissioned to construct free-standing furniture for the museum. This included one octagonal and six astragal-ended table cases in mahogany. Three of the latter survive; one is housed in the National Museum on Chambers Street, and the other two have found their way to Mellerstain House, Gordon (46).

Robert Adam's design for this space was quite different because it was intended to accommodate the Great Hall. The only features that Playfair retained were the staircases flanking the piazza on the east side, and the columnar screens to the interior at the north and south ends of the lower and upper halls.

Beneath the principal museum hall was the lower museum which has been described by Gifford, McWilliam and Walker as "... a Greek Doric temple inside out ..." (47) (Fig. 14). The entrance to this was from the north side of the piazza via the stair that led to the upper museum hall. This museum was on two levels which was negotiated by two short flights of steps to the north and south. Attached columns decorated the walls on the east and west sides. Distyle in antis screens of columns to the north and south, aligned with the steps, marked the change in level at each end. The space was lit from just five windows in the west elevation. The two windows that Adam had planned to the east were made into external niches and the central door became a decorative blind window (Fig. 13). Playfair's plans for this space are quite different to Adam's in respect of fenestration and also in the inclusion of the attached Doric columns to the east and west walls. Internally, Adam's room would have been apse-ended to the

north and south. The columnar screens, like those of the upper museum, seem to have been adapted from the Adam design.

The collection was deaccessioned and divided in 1865, with the majority of it forming the basis of the National Museum in Chambers Street. The geology and zoology collections were moved to museums in new departmental buildings built on the King's Buildings site during the 1920s and 1930s. Both the upper and lower museums have suffered very little modernisation. The upper museum remains largely as designed by Playfair and still functions as an exhibition space. The lower museum was fitted up in 1973 to be used as a Senate Room. Whilst this re-fitting is completely insensitive to Playfair's interior, it has left the internal arrangement of space intact and has not altered it irreparably.

ANATOMY MUSEUM, UNIVERSITY OF EDINBURGH

The teaching of anatomy in Edinburgh during the eighteenth century was a joint venture between the University and the Royal College of Surgeons. At the University, the chair was occupied by a dynasty of professors from the Monro family. Between them Alexander Monro (primus), Alexander Monro (secondus) and Alexander Monro (tertius) held the anatomy chair for 126 years between 1758 and 1846 (48).

The subject was originally taught at the university in the Old Anatomy Theatre, in a building that was erected in 1617. In 1764 an extension was added to the east which provided the department with an octagonal lecture theatre. Subsequently, the old lecture theatre was converted into a museum in which anatomical specimens were displayed.

Robert Adam's 1789 designs for the new College placed anatomy in the north west corner of the quadrangle. It was the first part of the College to be completed, and the fabric of the building was finished by 1792, the year of Adam's death. The design of the new theatre was very similar to the original; it was an octagonal space with raked benches around a central dissecting table (Fig. 18). Centrally-planned lecture theatres were common for instruction in this subject. The circular dissection theatre at Leiden University was designed in 1591 by Jan van Hout (49). It was built in the De Kerk van het Faliede Bagijnhof, a former church, and is the probable inspiration for all centrally planned dissecting theatres. Both Monro Primus and Secondus had studied at the Dutch University, and it seems likely that the inspiration

for the design of the Edinburgh lecture theatre came from the Continent. Placed on the upper floor of the college, it was 60 ft. high.

On the principal floor, beneath the lecture theatre, was the anatomy museum. It was also octagonal to the interior; its shape being dictated by the lecture theatre above. To the east of this there was another room given over to house the anatomical collections. In order to create an octagonal room from a square space the corners of both the theatre and museum were partitioned off. Within the north eastern corner triangle thus formed there was a staircase which provided direct access between the department's museum and classroom.

The museum was lit from two three-light windows to the north and west. The small triangular spaces in the north east, north west, and south west corners were each lit from a single window. The wide apertures between the main museum room and the corner cabinets did not have doors, so that the windows illuminating the corner spaces also lit the central octagon.

It was not until Playfair took over the college scheme that the museum was fitted out with furniture in 1826. Playfair designed neo Greek fixed display cases around the walls. His drawings indicate that the furniture beneath the windows comprised table cases with drawers underneath. The triangular niches in the corners were also fitted out with furniture in which to display the collection.

With the removal of the anatomical collection to the university's new Medical School in the last quarter of the nineteenth century, the room ceased to function as a museum.

Nothing remains of the original interior of this space.

FINE ART MUSEUM, UNIVERSITY OF EDINBURGH

Adam's late eighteenth century designs for the college had originally included a dome over the entrance to the quadrangle. A lack of funds meant that nothing was done about it until the 1880s after the University had received a generous bequest in the will of Robert Cox of Gorgie. Cox had died in 1872 leaving money specifically for the building of the dome (50).

Robert Rowand Anderson, who had designed the University's Medical School during the previous decade, was invited to submit a design (Fig. 19). The new dome was based on the Adam design, but greatly enlarged. It comprised a very high drum of two stages surmounted by a dome, its interior being lit by four windows in the form of distyle in antis Ionic porticos in place of the clock faces Adam had planned. The interior was given over to housing the new department of fine art. The classroom was located on the lower floor whilst above it was the fine art museum. It was an octagonal room side-lit from the four three-light windows of the porticos with eight circular windows set high in the wall beneath the dome. A spiral staircase to the north west gave access to the classroom below. The total cost was £3,700. It is the only example found of a purpose-built university museum designed exclusively for this sort of collection during the period covered by this study (51).

ZOOLOGY MUSEUM, ASHWORTH BUILDING, UNIVERSITY OF EDINBURGH

The University of Edinburgh's zoology museum has its origins in the Robert Sibbald and Andrew Balfour collections that formed the basis of the museum in the university's old college (Adam and Playfair). Its early history therefore follows the fortunes of Edinburgh University's museum until the early twentieth century when, in the care of Professor J. Hartley Ashworth, it sought and obtained new premises. Ashworth inherited a department and museum from his predecessor which was inadequate to cater for the subject in every respect. He was instrumental in obtaining funds to secure a separate departmental building (named eponymously) and oversaw the design and building of more commodious apartments on the new King's College site during the first quarter of the twentieth century.

Ashworth travelled to the United States in the 1920s specifically to appeal to the Rockefeller International Education Board for a grant towards the construction of a new building for the department. Significant donations towards the cost of erecting more suitable apartments for the department and its collection had already been promised from the Carnegie Trust (£18,000), and from a private bequest (52). Ashworth succeeded in obtaining a further promise of funds from the foundation of £74,000 (53), an enormous sum of money which paid for the majority of the building constructed on the Kings Buildings site (54). Robert Lorimer and John F. Matthew were the partnership chosen to design the building (1926) (55).

With its front elevation facing north-east, it comprises a

central pavilion with two splayed wings of uneven frontage either side (Fig. 20). The museum is housed in the longer west wing. The building is designed in a simplified and functional version of classicism, and with 'fitness for purpose' as the central guiding tenet of its form (56). For all this it is a fine piece of architecture. It is a two storey structure with a flat, horizontal roof line, and enormously wide and tall windows which fill the width of the space between each of the giant-order columns. Although the total surface area of glass to masonry is very high, the structure does not look ephemeral or light but rather has the impression of solidity. The utilitarian nature of the design is alleviated by zoological clay medallions by the sculptress Phyllis Bone.

The museum was situated to the extreme west of the west wing, and entered from a door at the end of the corridor that ran through the centre of the wing and which serviced the various laboratories and classrooms on either side. It rose through the height of the two storeys; the main hall occupied a space 55 x 40 ft. To the south there was a gallery, c.43 x c.14 ft. which was supported on solid masonry and beneath which was a cabinet room that housed the aquarium (Fig. 21).

Both the central hall and gallery were exclusively roof lit. The main space was lit from what is described as a cupola for which special glass was commissioned that would reduce the entry of ultra-violet light.

[The museum] has a roof glazed with a glass which excludes the ultra-violet rays, which have been found to cause the fading of colours in specimens this is the first

attempt of the kind by Messrs. Chance, of Birmingham.

Externally it looks a fairly deep green, but the light transmitted is only very slightly - and pleasantly - tinted and does not disturb the colour values of the specimens. (57)

This concern and awareness of conservation issues is largely atypical of the time, although the University of Glasgow had also displayed a similar sensitivity for the care of its collections, albeit with different solutions, in the construction of the Zoology Museum.

The collection still exists although the majority of its space has been reallocated for laboratories; only the mezzanine and the south wall are still used for the display of museum objects. The north wall of the museum has been removed to extend the laboratories to the north of the west wing.

THE COCKBURN MUSEUM, GRANT INSTITUTE, UNIVERSITY OF EDINBURGH

The geology collection of the University of Edinburgh Museum moved to the Grant Institute, Department of Geology in 1931, where it was housed in a purpose-built space. The original collection was built up by Robert Jameson, Professor of Natural History at the University of Edinburgh (1805 - 1855), and was housed in the upper museum of the New College of Edinburgh University. The entire building was funded by Sir Alexander Grant of Forres, Bt., a wealthy Scottish businessman, who was granted an honorary degree and a permanent monument to his name, in return for his generosity (58). The Institute was built to house the university's department of geology, and designed by Sir Robert Lorimer (1864 - 1929) in 1929 (59).

It is placed between the earlier buildings of the departments of zoology and chemistry (1920s) which run in a line on the King's College site from east to west. The Institute is a two storey structure with an additional half basement to the east and attic space above the central pavilion. Prior to the 1970s extensions it was an 'E' plan building built on sloping ground (hence the half basement) with the front elevation facing north (Fig. 22). Both internally and externally the institute has very little by way of extraneous ornament. It has a projecting central entrance pavilion with five bays either side of this, and projecting one-bay pavilions to the east and west. Gable roof ends above the bays to either side of the entrance and to each of the end pavilions add rhythm to the roof line but do not punctuate the horizontal. The fenestration is even and simple but the manner in

which the pitched roof crowds down upon the first floor windows gives the building a long, low and squashed appearance. In essence it is a practical piece of architecture with little or no pretension. The only gratuitious ornament is the pedimented and balconied first-floor window, and relief sculpture (1931, Alexander Carrick A.R.S.A.) in the central pavilion (Fig. 24). This sits uneasily and in stark contrast to the functional simplicity of the rest of the building. Earlier sketches of the north elevation show a much more restrained pediment. This excessive detail is almost certainly the result of over-exuberance on the part of Matthew, and is a terrible imposition on an otherwise entirely successful piece of architecture.

The museum was housed in a rectangular room on the first floor of the east wing and mirrored in the west wing by a library occupying a square space on the same floor (Fig. 23). The museum was blind on two sides, and the total display area for the collection described an 'L' because of a store room in the north-western corner. Immediately abutting both the museum and library in the east and west wings were two secondary staircases providing access from the ground floor. The museum was lit by three windows to its southern elevation and four to the east, with additional artificial lighting. Interior photographs of the museum, prior to the removal of the original furniture, show fixed display cabinets running continuously along the walls in between the windows, and a number of glass-topped display tables arranged at right angles to the door.

THE MUSEUM OF THE DEPARTMENT OF RESEARCH IN ANIMAL GENETICS,
KING'S BUILDINGS, UNIVERSITY OF EDINBURGH

Lorimer and Matthew's third departmental building for the University of Edinburgh was that for Animal Genetics Research. The department was established in 1920 by Professor F. A. E. Crew, and grew out of the Department of Zoology. Prior to the construction of purpose-built accommodation on the King's Buildings site, the department was housed at the Old Infirmary, and within the Chemistry Department. Crew, who was instrumental in the establishment of the department, was also the first occupant of the University Chair.

The department was financed from a number of different private individuals and organisations. Most notable were gifts from Mr T. B. Macaulay (President of the Sun Life Assurance Company of Canada), the International Education Board, and Lords Woolavington and Forteviot. Mr. Macaulay had established a long tradition of providing financial assistance to Scottish Universities; he funded the Soil Research Institute at Aberdeen, and gave the University of Edinburgh more than £67,000 for several different projects over a number of years.

Opened in an official ceremony in 1930, Animal Genetics Research was the western-most in a line of departmental buildings designed by Lorimer and Matthew, which fronted West Mains Road. The department was the last in the series to be constructed. Since the plans have not been located it is not possible to ascertain exactly when it was designed or to give a very full report of it as built. The following description of the department and its

museum is based upon contemporary accounts and photographs printed in the national press (60), and a press release issued by the firm for an article to be printed in *The Scotsman* in June 1930 (61).

The principal elevation was to the east and measured 91 ft. in length. From east to west, along the West Mains Road, it was 140 ft. It was a very simple, undecorated building of three floors (which includes a half basement). Of all the edifices designed by Lorimer and Matthew on this site this is by far the most plain, almost to the point of being ugly. A flight of steps, negotiating the half basement led to the entrance door in the east elevation. This door was placed in a projecting central pavilion, and recessed beneath a wide, low, depressed arch. The single-bay central pavilion was decorated with a tall, curvilinear pediment, which is typical of Lorimer. As at the department of geology this central pavilion is too ornamental and tall to find harmony with the rest of the structure. It seems inappropriate in its curved lines when the rest of the building comprises straight, horizontal and vertical lines. Although the building suffers from this incongruity, it could never be said that the building was spoilt by these excesses, since it was never an especially handsome edifice.

Exactly how the space was divided internally is a matter of conjecture since the plans have not been located. The architect's press release describes it in some detail: directly above the entrance hall, on the first floor, was the main lecture hall. Flanking the lecture hall, on either side, were the museum and library. The former was lit from south light, whilst north light

illuminated the museum. The dimensions and internal arrangement of space within the museum are not known (62).

PATHOLOGICAL AND ANATOMICAL, AND BARCLAY MUSEUMS, THE ROYAL COLLEGE OF SURGEONS, EDINBURGH

The Alexander Munro anatomy collection which was housed in an old anatomy classroom at the University of Edinburgh was moved to the Royal College of Surgeons Hall in 1804 when it was decided to separate the two disciplines of surgery and anatomy (63). Subsequently, the Royal College established the post of Professor of Surgery and set about obtaining specimens to add to the collection it had inherited from the university. The museum collection was originally housed in the Old Surgeons Hall of 1697 but as it grew by donation and acquisition, notably the Barclay bequest of 1828, a new building was required.

The New Hall Committee had initially proposed that the College purchase the old High School building which could be converted and extended, but following the advice of William Playfair a completely new building was agreed (64). The new accommodation was required to include a Museum, Library, Committee Room, Meeting Hall, Classroom and supporting service rooms (65). One of the most important considerations in making this decision was the need to provide a building that could properly display the Barclay bequest. The subject of the Museum forms the first resolution passed by the Committee in a report of 1828 "That the College should erect a New Hall, enabling the pathological and anatomical specimens to be displayed to their best advantage and to be available for teaching." (66). The college purchased the Riding School, a large building by Robert Adam on Nicholson Street, and in 1829 Playfair's designs for the building were

accepted (67). The Old Surgeons Hall was in such an advanced state of decay that it was not considered safe to leave the collections there. All specimens were removed to private houses until the New Surgeons Hall could receive them upon its completion in 1832.

The Surgeons Hall is a Greek neo Classical edifice with an enormous Ionic portico on Nicholson Street which rises to the full height of the building (Fig. 25). The fluted columns of the portico rest on a high pedestal which forms a screen wall, flanked by footgates, to Nicholson Street. If the portico had risen from a flight of steps, as was standard in neo Classical buildings, it would have set the hall so far back as to be obscured by the tenements facing Nicholson Street on either side. Playfair explained the use of the pedestal in a meeting with the Committee in 1831. "This front wall would enable the portico to project so far forward to be seen at a distance, which is of the first importance." (68). The tympanum and frieze are decorated with an acanthus motif, which was a compromise negotiated by Playfair. The Committee had rejected the use of the Corinthian order for the portico because of the expense involved, and they had also decided against any enrichment to the facade for the same reasons. Playfair managed to convince the committee that, for relatively little expense, they could improve the external appearance of the College by adorning it with decorative foliage sculpture in the classical tradition. Playfair even argued that in allowing decorative sculpture, the facade would give the impression of being Corinthian without actually being so. Playfair's New Hall comprised two storeys with a tall basement

level; the two collections occupied the entire first floor in two halls (Figs.26 & 27). The New Hall Committee had advised Playfair to situate the two museums adjacent to one another, with the Barclay Collections forming "...a grand and imposing frontage." (69). They also requested that the two collections be distinct yet unite to form a complete and interesting museum. The museum entrance was built to the side rather than at the front because Playfair considered that the alternative would be too expensive and that it would spoil the overall aesthetics of the space. The hall at the west end held the Barclay collection. It was a 40 x 40 ft square and contained a gallery. The pathology collection was housed in an oblong hall at the east end which measured 40 x 97 ft. It had a gallery on all four sides and was divided into seven bays on each side at both the lower and gallery levels. The mezzanine is supported on a giant pilastrade of square piers with coupled antae. The possibility of fire-proofing the museums by replacing the wooden floors with stone or iron was raised during the course of construction. Playfair objected to this; it would have been too expensive and the timbers had not been designed to carry the weight of anything other than a wooden floor. He also objected to it on the basis of aesthetic principles (70). The floor was therefore executed in oak.

Both museum halls were lit from windows at the lower level, and with roof lights to the central well and gallery. The college was fitted out with gas lighting from the outset to supplement natural light. The roof lights were in the form of skylights over ground-glass laylights. In 1831 Playfair presented the Committee of the College of Surgeons Hall with a report concerning the

lighting of the building in answer to concerns expressed by the Committee.

The Museum it will be recollect is lighted by a range of windows that are below the Gallery and by a series of skylights which are in the ceiling. At the South Eastern corner the New Hall approaches very closely to the High Houses that have been erected there - and in consequence that end of the Apartment is thrown somewhat into the shade. This effect however has always been anticipated and is the result of a situation that could not be avoided. Another cause which contributed to give a grave character to the Apartment is the arrangement of the skylights. These consist of Internal Horizontal Skylights resting on the Timbers of the Roof. The latter being immediately above the former the light passes through them both in its passage to the museum and is generally diffused over the apartment by the interposition of the Ground Glass. This diffusion of the light occasions a less luminous general appearance than would be the case were it transmitted through common glass alone but for useful purposes does not in my opinion interfere. I think indeed that no apprehension need be entertained on the subject and that when the Painter has done his work and the preparations are in their places, they will be seen to great advantage....Although there will be no general blaze of light in the apartment there will be quite sufficient at those places where it is most wanted - always excepting one or two rows of shelving in the South Eastern End of the Museum.....It has been suggested that to remedy the want of light a window should be opened at the

Eastern End of the Apartment. This in my opinion would be of very small advantage to those parts that are in the shade.....I am quite of opinion that good steady light is of the highest importance in a Museum and if a greater quantity should be wanted here I would recommend a different mode of getting it than the introduction of another window. I would advise that the space between the inner and outer skylights be boarded up and painted white which would at once confine the light and reflect it down upon the room. (71)

Playfair further suggested that the walls of the houses standing opposite the College, which had blocked out the light, be white-washed to help reflect all available light into the museum. The alterations suggested by Playfair were adopted for two of the skylights. It was also found necessary to replace the ground glass of the lay-lights at the east end of the pathology museum with clear glass because of the serious deficiency of light to this end. The remaining lay-lights were to be left for a trial period of twelve months.

The museums were heated by a number of stoves along the south-east wall.

The painting of the interior of the college was contracted out to a number of different painters, among whom was David Ramsay Hay, a pioneer on colour theory and widely accepted as one of the first professional interior decorators. Hay had been involved in the decoration of the interiors of a number of Playfair's buildings including the National Gallery and the New College of Edinburgh University. Playfair's level of involvement in the design of his buildings also included a large input in the

fitting out and decor of the interior. The overall effect of the finished product, and the appearance of the interior were as much his concern as the basic fabric. He designed the furniture and display cases, directed the joiners in the construction of the plinths, and he sent out specifications for the contract painters. This was partly to ensure unity of the whole once completed but also so that his work, as architect, would not be overshadowed or embarrassed by the poor judgement or over enthusiasm of others. In a letter to Lord Lynedoch written during a visit to London, Playfair writes of the interior decor of Windsor Castle that it is "...very appropriate and in general well understood, but considerably I think overcharged with gilding. The upholsterer frequently puts the Architect too much in the background." (72)

THE NEW BARCLAY MUSEUM, ROYAL COLLEGE OF SURGEONS, EDINBURGH

An extension to the Royal College was proposed in 1908 which comprised a bridge from the principal floor of the pathology museum into tenements to the south east at No.s 7-9 Hill Square. This extension was required because of an earlier (1907) decision of the College Council to convert the Barclay into a meeting hall (73). It was initially suggested that the anatomy collection simply be disposed of altogether:

It is necessary to point out clearly that in order to carry out the whole scheme it is essential either to get rid of The Barclay Collection or to remove it to some other part of The College property. The Collection has ceased to be of any value to the Fellows or to anyone visiting the Museum and it is occupying much needed space to no purpose. (74)

Opinion on the subject was varied. Charles Walker Cathcart, the college conservator, was of the opinion that the collection should indeed be disposed of but favoured the continued use of the space as a museum (75). There must also have been a large faction that supported keeping the collection, for the end result was the conversion of the museum into a meeting hall, and the removal of the collection to the Hill Square extension.

Robert Rowand Anderson and Balfour Paul were the architects selected to carry out the work (76). Rowand Anderson was an obvious choice given his experience of designing both museums and educational establishments; he had also undertaken major conversion projects in Edinburgh and Glasgow.

Barclay Hall was extended 6 ft. each way to the north and south

in 1908/9. The huge columns and mezzanine were removed, and the skylights above the mezzanine were filled in, leaving just the central domed skylight that sat over the museum well. The ceiling and cornicing were drastically remodelled - Playfair's simple and restrained cornices gave way to flamboyant and chunky plaster work. These alterations seem somewhat pointless in view of the fact that Playfair's original room was completely ruined, rather than enhanced, for the sake of an extra 12 ft. of space.

The extension of the museum into Hill Square, also by Anderson and Paul, ran concurrently with the other work. The tenements, which had been used as laboratory space, were massively altered so that all of the third floor apartments, and the majority of those on the second floor became museum accommodation (Figs. 28 & 29). No.7 housed the principal museum and was known as Cathcart Hall. Nos. 8 and 9 held further museum spaces one of which had a gallery which also acted as a corridor into a museum at the eastern end of the extension.

The second and third floors of the tenement that was to become Cathcart Hall were completely gutted, and a spacious and extremely ornamental museum constructed in its place (Fig. 30). The principal floor was reached from the bridge that connected it with the pathology museum. It was surrounded on all four sides with a mezzanine that was decorated with a metal balustrade which imitated the style of Playfair's, and thus provided some level of continuity between the old and new apartments. This however, is where the cooperation of styles begins and ends. Anderson and Paul's museum is a most unexpected Rococo event. It is as decorative and lavish as Playfair's is modest and understated.

That it is so obviously a secondary space, an extension, which is not 'labelled' by remodelling of the exterior, makes its splendour a complete surprise. Playfair's museum relies on size and elegant proportions for its effect, whilst Cathcart Hall, which is relatively modest in size, uses a great deal of decorative embellishment for its impact. The squared column supports of the mezzanine and roof are classical but conform to no distinct order. They are surmounted by fussy capitals, and the cornice is decorated with a lavish and highly plastic fruit and flowers motif.

A narrow, wooden dog-leg stair leads from the principal floor to a cabinet room which communicates with the south mezzanine. A well-stair outwith Cathcart Hall in No.8 also gave access to the gallery, and to that of the secondary museum space of the extension. Specimens were displayed in free standing cases and in glass panelled wall cases.

The ceiling of the central well of Cathcart Hall was barrel-vaulted and a large part of it was glazed with ground-glass lay-lights. Light was also admitted from banks of lights above the mezzanine, those to the south and east, like the central sky-light, consisted of lanterns over laylights. The north and west ones were simply flat lights following the line of the roof. The majority of the old tenement windows were blocked up but three were left on the second floor to the west, and one, lighting the staircase on the top floor, also to the west. Two windows on the south side admitted light to the museum cabinet gallery but these, together with the window that lit the staircase, were the sole source of natural illumination to this space. It must

therefore have been relatively gloomy. All of the other museum rooms were lit from windows which, in the case of No.8 were at both second and third floor levels. Artificial light was almost certainly used in conjunction with natural light. The college records detail electricity bills as early as 1894/5 (77), and by the time Nos 7 - 9 were converted in 1909 it is probably safe to assume that artificial light was common throughout the hall, and that Cathcart Hall was designed with electric lighting. The lack of natural light to the cabinet and the very elaborate cornicing in the main museum hall of the extension would tend to support this.

Given the grandeur of the museum extension, and the expense involved in both converting the tenements, and the old museum into a suitable meeting room for the college fellows, the external appearance of the New Barclay is a surprise. No attempt was made to make the exterior look like anything other than a very shabby domestic building. Why this should be so in the Edwardian opulence of the 'garden party' era that preceded World War I, remains something of a mystery. It cannot be seen as indicative of either a shortage of funds, or as a sign that the emphasis of the collection's role in education at the college was in decline. The treatment of the interior is too thoughtful to admit of this, and makes the careless approach to the exterior all the more difficult to understand.

REID SCHOOL OF MUSIC, UNIVERSITY OF EDINBURGH

The University's School of Music has its origins in the first decade of the nineteenth century with a sizeable bequest in the will of General Reid specifically for the foundation of a Professorship in Music (78). The collection itself was not established until the middle of the same century under the University's Professor of Music, John Donaldson, who also instituted the plans for, and oversaw the building of, the Reid School (79). Donaldson's struggle to wrestle back the Reid Bequest from the University Court and Senate, who had been misappropriating the fund since it had first come into their possession in 1838, is now part of the University's legend. The Court had taken control of the fund and, ignoring the intentions of the bequeather, used it to finance a number of projects that improved and extended the university buildings but which were not specifically connected to the establishment of a School of Music. In 1854 the university suggested that the school contribute towards and share a building designed as a public meeting place. Donaldson, who was King's Counsel, took legal action against Court and Senate, and after five years of litigation secured the Reid Bequest (80) solely for the use of the Department of Music. The School was designed by the city architect, David Cousin, c.1858. The foundation stone was laid in 1858, and the building was completed by 1859/60 (81). Situated in Teviot Place, facing west, Cousin's building predates the Medical School and McEwan Hall and, originally dominated the site. It is now totally overshadowed by these much larger and taller buildings to the

extent that it is now difficult to appreciate just how fine a piece of architecture Cousin's Roman neo Classical building is.

Running from west to east, it comprises a very tall, two storey central portion, with two, low one-storey wings flanking it to the north and south. A basement underneath the whole is above ground on the south side because of the slope of the ground. The south wing is essentially a facade built to balance the front elevation; it is an entrance hall and is only one bay deep. The north wing runs the length of the building and houses the museum (east) and library (west).

There were two entrances to the museum from a rear door to the east and, to the west, from the main entrance hall via the library. A door from the museum opened into the curator's quarters on the east side. There was, therefore, no direct access to the museum from the outside - it could only be reached by the users of the whole building ie. students of the subject. The museum occupied two thirds of the north wing (Fig. 31). It was lit from four large windows set high into the north wall (the sills are roughly shoulder height) which provided plenty of light but no view. Early photographs show that artificial light was provided from at least two gas lights which hung from the ceiling down the centre of the room. Objects were exhibited in fixed, glass-fronted, wall cases, and in a series of free-standing cabinets that ran the length of the room.

There was no great entrance to the museum and it was clearly not intended as a public space or with a view to creating any great impact on the visitor. Its design and relationship to other

spaces in the School is indicative of its function and purpose (82). The museum was a repository for instruments used to demonstrate and explain the science of acoustics. Many instruments were purchased by Donaldson at auction, or acquired by donation, but they were never treated as historical or ethnographic objects. A large number of them were modern when purchased or commissioned from instrument-makers, and it was never Donaldson's intention to collect items that would become historical objects, only that they would be a source of reference for the students (83).

GENERAL MUSEUM, ROYAL (DICK) VETERINARY COLLEGE, EDINBURGH

William Dick (1793 - 1866) is generally considered the founder of veterinary practice in Scotland. He graduated from the Veterinary School in London in 1818 and began lecturing in Edinburgh in 1819 (84). In 1821 the question of establishing a school to teach the subject was first raised by the Lord Provost of Edinburgh. He envisaged it being under the auspices of the university although, when a school was established, it was in connection with the Highland Society (85). The committee appointed to oversee the appointment of a lecturer elected William Dick to the position. Dick taught in rented accommodation on Clyde Street but within the space of five years he had raised the question of the School needing its own premises. O. Charnock Bradley provides a vivid account of Dick's rooms as described by a vet of the 12th Lancers in 1830:

You may fancy to yourself a room of no very great dimensions in an old and apparently long untenanted house in Clyde Street. You enter it from the street door, and are immediately struck with the delightful confusion which seems to reign within. Skeletons of all descriptions, 'from a child's shoe to a jack-boot', from a horse to an ape, not ranged in 'regular order all of a row' but standing higgelty-piggelty, their ranks having been broken by the Professor's table, and their heads looking in all directions, as if thrown together by chance. Over the Professor's 'devoted head' is seen suspended a portion of inflated and injected intestine ... while all around the room, and especially in the corners, are heaped

together vast quantities of diseased bones, and other preparations, seemingly without order, and without arrangement. (86)

There were several attempts at alleviating the chaotic conditions in which Dick taught by making piecemeal additions to his rooms. This allowed him to separate the different tasks involved in teaching the subject into different rooms. By 1831 his teaching collection was in a space of its own and is first referred to as a museum. Conditions, however, were far from ideal;

The Lecturer's room is not comfortable, the museum is small and does not permit of the proper display of specimens. (87)

Between 1831 and 1833 a new School was designed and built on Clyde Street. The total cost of the building is not known but Dick himself provided £2500, and the Highland Society donated £50 to fit up the lecture room (88). Designed by Richard and Robert Dickson of Edinburgh, the School was built around an oblong yard with an entrance through an archway from Clyde Street. It included accommodation for a surgery, stables and loose boxes, lecture room, library, museum, Dick's office, and his private dining room. The museum was located on the west side of the yard on the first floor above the stables. The rooms on this side of the quad were somewhat oddly distributed so that Dick's dining room was situated between the museum and the library and lecture room (89).

Dick campaigned tirelessly to get his course recognised by the Government. He wanted the certificate that his students received to be on an equal footing with that given to the London graduates

in veterinary surgery. This he succeeded in doing with the agreement that graduates from Edinburgh qualified to practise in the army or East India Company (1837), and when the School received its Royal Charter and became the Royal College of Veterinary Surgeons (1844) (90).

Following the death of William Dick in 1866 the Lord Provost, Magistrates, and Council of the City of Edinburgh were appointed Trustees to manage Dick's estate which he left in trust to maintain the Royal College. Shortly after his death the Trustees proposed moving the School to a new site so that it could, amongst other things, be closer to the university. This did not happen until 1916. Instead the Clyde Street property was upgraded and extended.

An investigation into the shortage of space in the College was instigated by the Board of Management in 1907. The resulting report was sufficiently inauspicious to warrant the Board making the decision to build an entirely new College on a larger site. The Old Brewery and a group of domestic houses in Summerhall were purchased the following year (91).

David McArthy, the architect who had advised the board in 1907, was commissioned to draw up plans in 1909. Progress was extremely slow, and it was not until 1913 that the existing buildings on the Summerhall site were demolished and building could begin. The design of the College seems to have been a collaborative effort with a great deal of input from the lecturers. Furthermore, at some point between 1909 and 1913, the architect and Principal of the College travelled to the Continent to study veterinary school design (92).

There are two sets of drawings still surviving for the original building dated November 1912 and 8 February 1913. The first set of plans are for the 'Clinical Department. Back Buildings.' which constituted a large block for livestock built around a courtyard to the rear (east) of the site. Plans for the college itself were submitted to the Dean of Guild Court a year later (93) (Figs. 32 & 33).

Architectural critics have been rather unkind about the exterior and interior of McArthy's building, and it has been described as "Fag-end Wrenaissance ... the front a dreary frame of columns and pediments. Inside, the pompous stair-hall is an epitome of bourgeois smugness." (94). It must be said that whilst this criticism is harsh it is also exact. The facade is a particularly unattractive example of Edwardian Baroque ill-suited to its large glazed areas. The three storey central pavilion sits awkwardly with the remainder, and the clashing detail of the exterior is matched by a surfeit of opulence to the entrance hall which is needlessly ostentatious.

The building was roughly 'u' shaped in plan. It was double-pile with a corridor that ran along the north-south axis, and west-east through the north and south wings. There were three rooms allocated to the museum collections of anatomy, biology and *materia medica*. The general museum (situated in the anatomy department) was the most significant of the three spaces. The 1913 plans show alterations which indicate that the general and biology museums were originally intended as one continuous 28 x 59 ft. space. The decision to create two separate museums was obviously made very late in the proceedings, and the dividing

wall and door between the two appear as sketched additions to the plans.

The corridor through the north wing was interrupted by the general and biology museums which had to be traversed in order to move between the departments of anatomy and biology. The general museum, as finally realised, occupied a large portion of the north pavilion on the ground floor in a 28 x 40 ft. space. Access was provided from a door to the corridor and the museum also connected with the anatomy department through the biology museum. There were no doors directly to the exterior so the museum could only be reached from either of the two departments.

A very large, three-light window to the west, and four single-light windows to the north provided the only natural light to the museum. There was no top light. The collection was displayed in continuous, fixed wall cases which lined the walls of the museum on the south, east and west sides. The plans show that the wall case on the west side ran across the large window of the north pavilion. The furniture on the north side of the museum was arranged in carrels which created four bays, each lit by a window. In addition, each carrel was bisected by table cases which ran parallel to the cabinets that described each bay.

Separate museum spaces were designated for the collections of the departments of biology and materia medica. The biology museum sat to the east of the general museum and occupied a 28 x 19 ft. room which was created through the rationalisation of the general museum. It was side lit from two windows to the north and furnished with both fixed wall cabinets and table-top display cases. The museum of materia medica had apartments in the south

wing of the college similar to those of the biology museum.

It is interesting that the dissecting room on the first floor of the north wing was more archetypal of museum design than any of the museums purpose-built for the college. It rose through two floors and had a mezzanine floor to the south and west. The gallery was supported on consoles to the south, and on metal columns to the west. A metal staircase led from the principal floor to the gallery, and a door at the eastern-most end of the gallery allowed access to the staircase in the north wing. The dissecting room also housed museum objects in fixed wall cases both on the principal and gallery floors. Huge north-facing, bench-to-ceiling side lights lit the principal floor and gallery. In addition to this there were angled sky lights in the coved ceiling which admitted north light.

ANATOMY MUSEUM, UNIVERSITY OF EDINBURGH MEDICAL SCHOOL

In 1871 the accommodation provided for the medical school in Playfair's Old College had become inadequate to cope with the size of the department. At that time the University's medical school was considered one of the finest in Europe, although its premises barely reflected its status. Extra space was urgently required and the University Senate agreed to purchase the land to the south of Teviot Place to erect a building to house the school (95). This was a particularly appropriate site since the new infirmary was in the process of being erected on the other side of Meadow Walk. The building committee invited architects to submit proposals and stipulated that there was to be no excess of ornamentation, and that the building was to include an anatomical museum, lecture theatre and college hall (96). Designs were received from Lessels, Cousin, Peddie and Kinnear, Wardrop and Reid, and Anderson.

Robert Rowand Anderson was the successful competitor and was given the commission in 1875. Prior to drawing up his design, Anderson had travelled widely through Britain and Europe conducting research at the universities of Liverpool, Manchester, London and Oxford, and at South Kensington Museum, the Sorbonne and institutions in Amsterdam, Utrecht, Berlin, Leipzig, Bonn and Aachen (97). Anderson's approach was a serious and professional one; he intended to borrow from the best of what he saw in laboratory, museum and lecture theatre design in order to formulate the most successful solution in his own medical school. Anderson's competition plans were for a building constructed

around two courts; one public (the Great Court) and one private (98). The two were separated by college buildings that were to house the anatomy museum. The front elevation of the school faced north onto Teviot Row (Fig. 34). With the purchase of more land in 1877, to the east of the existing site, the plans were significantly altered. The school still had the same basic plan but the great court was vastly extended as the semi-circular graduation hall on the east of the court was pushed out into the newly acquired land. The eastern pavilion, which matched that to the west of the front elevation, was replaced by a soaring campanile (an architectural feature often used by Anderson, although thankfully never built here). The western pavilion was given an extra floor presumably to balance the extraordinary height of the campanile.

Anderson chose an early north Italian Renaissance style for the building, which was a sensible decision given the asymmetrical overall plan of the school as a result of both the irregular plot and Anderson's commitment to providing the most suitable space according to function. In the west facade the asymmetry is at its most obvious and takes the form of blocks of accommodation with varied elevations. The style Anderson chose had the flexibility to cope with this and managed to avoid looking untidy or unsystematic. A contemporary critic, writing for the *Scotsman* in 1877, appreciated the thoughtfulness of Anderson's design and observed:

In catering for the difficult task of providing for the varied requirements of ten distinct professors, Mr Anderson proceeded on the sound principle, too often disregarded by

architects, of first securing the necessary accommodation in the most desirable shape, and then considering what sort of elevations would adapt themselves to the interior thus adjusted, so as to secure an artistic ensemble. (99)

This piece of journalism expresses the early Victorian trend towards architectural 'honesty'. This was a notion first championed by Ruskin who demanded that form follow function and that buildings should not disguise their function but describe it. Writing in the *Chronicle* in 1854, Patrick Allan Fraser of Dundee encapsulates the argument in his article 'Amateur criticism of Architectural Works':

During all my examinations of ancient buildings I have ever found strong proofs that one great principle, that of usefulness, had suggested and controlled their original construction, and however quaintly picturesque in some of their lesser features, even their having grown out of the requirements of the individuals or bodies for whom they were erected, and that invariably their exterior forms correspond in character with their interior arrangements, and with the end and object for which they were designed. But I have failed in my attempts to discover any such leading principle as usefulness regulating the construction of modern buildings. I see Police Offices, Infirmaries, Railway Stations, Clergymen's Manses, Jails, Country Mansions, Villas and farm houses, all possessing pretty nearly the same external features, and all bearing evidence of a want of consistency or harmony between their exterior and interior arrangements. and the requirements of those for whom they have been erected. (100).

Anderson's medical school makes him very much a part of this movement. In a speech given at the official reception for the Tercentenary Festival, Anderson said that he could not have used Greek Revival because it would not have been suitable, and that Palladian would have required him to " ... sacrifice the interior to the exterior." (101). His use of the north Italian style marked something of a departure in architecture; it was not a particularly popular style, although it had been used at the earlier Industrial Museum.

The school was finally started in 1878 and the first phase of building was completed by 1880. The second phase, which coincided with the Tercentenary of the university, was finished by 1884. The school, including the McEwan graduation hall, was completed between 1886 - 1890 (102).

One of the three apartments distinctly specified as a prerequisite in the building committee's original remit for the school was the anatomy museum. The site and design of the museum remained the same throughout Anderson's initial competition submission and the subsequent revisions. Completed as part of the first phase of building, the museum was housed in the portion of the building to the south of the great court on the first, second and third floors (Figs. 35, 36 & 37). In addition to the main museum space there were five other rooms given over to the display of the department's collections. One of these subsidiary museum spaces, the skull room, is discussed later.

A door from the rib-vaulted entrance hall led into the principal floor of the museum on the first floor. Rising through three floors to the ceiling, the museum occupied a 112 x 39 ft.

rectangle. It had a mezzanine to all four sides on both its second and third floors (Fig. 38). The lower mezzanine was supported on columns, whilst the narrower, upper mezzanine rested on brackets. Two spiral staircases in the north-east and south-west corners gave access from the principle floor to both of the mezzanines.

Lighting was provided from a combination of side and top lights. There were six three-light, and one single-light, windows to each of the north and south elevations on the first floor, and most of the ceiling comprised a ground-glass laylight over which there was a lantern sky-light. More windows were put into the second and third floor during the 1960s and 1970s when the mezzanines were filled in to provide more space for classrooms.

The entire space was fitted out with fixed wall cases on all three floors. On the principal floor glass-fronted display cases, which ran the height and depth of the mezzanine above, were arranged in carrels. On the same floor specimens were displayed in free-standing floor cases. A large amount of this purpose-built furniture still exists and is used to house the collection in the upper mezzanine which continues to function as a museum.

The huge amount of space given to the museum, as a proportion of the whole, and its immense grandeur is unrivalled by any other university museum built in Scotland. It is a testament to the dominance of anatomy in the teaching of medicine, and of the pre-eminence of Edinburgh University in this subject. Other museums, like that built for natural history at Old College, Edinburgh, were undoubtedly spacious and splendid, but they were devoted to the collections of a number of different departments. The medical

school's museum was given over entirely to anatomy (although objects which are more obviously illustrative of social history found their way into the collection), and there is no other university museum dedicated to one subject on this scale. It is ironic however, that the very same decade in which the museum was built saw a trend in the teaching of medicine towards physiology and away from anatomy. Thus, shortly after completion the museum was already something of an anachronism.

McKinstry, author of the definitive book on the life and architectural history of Robert Rowand Anderson, believes that the probable inspirational source for the medical school, in terms of style, is likely to be the National Museum on Chambers Street. It is also possible that Anderson sourced Fowke for his double mezzanine, which was unique in Scotland at this time. Anderson travelled to England in 1875 to investigate modern museum design. The notebook he kept whilst travelling mentions a visit to Waterhouse's Manchester University. Later on in the same year the architect went to the Royal College of Surgeons, London where he sketched the internal elevations of one of the many museum spaces (103). Both of these English examples had double mezzanines.

THE SKULL ROOM, UNIVERSITY OF EDINBURGH MEDICAL SCHOOL

To the west of the Medical school's anatomy museum on the first floor was a door that led into a cabinet museum which housed the school's skull collection (Fig. 39). It is a beautiful small-scale example of university museum design and is preserved in its entirety. The museum still possesses its original terrazzo mosaic floor and the majority of its furniture, including some tables designed by Anderson.

The museum is a 16'2" x 23'10" space with a mezzanine around the north, east and west walls which is supported on wooden brackets. A narrow, wooden, dog-leg stair runs between the main floor and gallery. Beneath this, continuous glass-fronted cabinets running to the height of the mezzanine line three walls. There is a further range of floor to ceiling wall cases on the second floor. Specimens were exhibited on the south wall in a table-top display case under the window.

The cabinet is lit from an enormous 10 ft. tall window that occupies most of the south wall over-looking the private yard.

THE PHRENOLOGICAL MUSEUM OF THE PHRENOLOGY SOCIETY AND
HENDERSON'S TRUST, No. 1 SURGEONS SQUARE, EDINBURGH

Edinburgh established a Phrenological Society on 22 February 1820, and was in possession of a collection which could be termed a 'Museum' from at least 1841 onwards. Minutes of a meeting of the Trustees of the Henderson Trust detail a request from the Society for a yearly donation of £6 to help defray the rent of the two apartments in which their museum was housed (104). The museum was housed on Clyde Street and in later minutes of 4 March 1850 reference is made to this property being in the possession of a "...Mr. Dick of Clyde Street..." (105). This is William Dick, founder of the Royal (Dick) Veterinary College, which, from 1833 acquired a purpose built School, for which Dick himself provided £2500.

Although minutes make reference to a phrenology museum at Clyde Street it is difficult to ascertain if this was a purpose-built museum space or merely rooms within the building being given over to house the collection. The term museum has always had a very loose application and can be used to refer both to a collection and the physical surroundings it occupies. Furthermore there is no reference to a phrenology museum in Bradley O. Charnock's 'History of the Edinburgh Veterinary College' which contains a description of the Dick accommodation as it was in the 1830s and 1840s.

Whilst the Phrenology Society was a body separate from and independent of the Henderson's Trust, it is quite obvious that the Society had few resources of its own and relied very heavily

on the financial support of the Trust, and that consequent of this, the minutiae of its business were known to the Trustees. This commitment to the Society was as a result of the directions of the founder of the Trust, the deceased Dr. William Ramsay Henderson, who directed that the residue of his estate "...Shall be applied by his Trustees in whatever manner they may judge best for the advancement and diffusion of the science of phrenology and the practical application thereof." (106).

The minutes record that by March 1849 the museum of the society was in desperate need of re-location because of the lack of room at Clyde Street (107). Exactly when the Trust began to take such a pro-active interest in the Society's affairs is not clear but certainly by this date it had assumed a supportive role.

With the recognition, in c.1849, of the Society's need to find new premises to accommodate the growth of its collection it was mooted that property be bought in the Old High School Yards (108). This was No.1 Surgeon's Square, the anatomical lecture room, museum and dissecting room of Prof. Lizars. The Trust had the necessary funds to meet the purchase price of £400, and considered it would suit the Phrenological Museum. The use of the museum for teaching purposes, and the desire that it should be freely accessible were, and continued to be, of primary concern to both the Society and Trust. Even before it had purchased No.1 Surgeon's Square, the Trust had resolved that the rooms adjoining the museum should be used for the instruction of medical students, the working classes and the general public. This concern was expressed often throughout the museum's history and was frequently reiterated in agreements and constitutions as the

museum's status changed and title passed from the Society to the Trust (109).

Legal ownership of No.1 Surgeons Square passed from Prof Lizars to the Trust in 1850. The Trust financed considerable alterations to the building in order to render it suitable to house the collection. In its accounts of 4 March 1850 a total expenditure of £593.14.2½ is recorded, of which £193.14.2½ was spent on rendering it suitable for the Society's activities (110).

From the record of accounts it is possible to ascertain that the museum was lit from both sky-lights and side-lights, that the objects were displayed in open shelving that ran around the room in between the windows and that it was further lit, when necessary, with fitted gas lights. All of the old shelving from Clyde Street was reused but a further £17.11 was spent on new shelves which indicates that the collection had grown considerably, and that the new museum was much bigger than that in the previous building. The museum was sky-lit which necessarily implies that it was situated on the first floor of the building.

The Society did not own this building but paid rent to the Trust. This rent was fixed at £4, that paid to William Dick at Clyde Street, because by 1850, "...the Society is nearly destitute of funds." (111). Indeed, by 1859 the Society was so impoverished that it could no longer afford to sustain its museum and offered the Trustees its collection of skulls and casts, together with the presses in which they were displayed, as payment in kind for approximately six months rent arrears (112). The museum was offered to the Trust dependent on it accepting

certain conditions. These included that either the present building or a suitable alternative be maintained to display the collection, that the public should have free access every Saturday for three hours, and that, on extraordinary occasions, individuals should be granted access outwith the usual Saturday hours on condition that an application had been made in advance (113).

The Trust accepted title and responsibility of the collection in 1857 and agreed to the conditions imposed upon it (114). That there was a body willing to take on the responsibility of care for the collection was most fortuitous since the Society was in such dire financial straits by this point that "...it was to be feared that unless the present arrangement were entered into, the collection would, in the course of a few years, be unavoidably dispersed." (115). A further condition of the agreement was that the Society were to have "...sufficient access thereto in all time coming." (116). Minutes in the proceeding years indicate that the Society did remain in very close contact with their museum and continued to enjoy unlimited access, and that relations between the two were at all times cordial and cooperative.

On gaining possession of the museum the Trust set about making significant improvements and alterations. The skylights were fitted with plate glass and the interior was painted. Alexander Stewart, the curator, cleaned, arranged and labelled all of the casts and skulls, and the shelves were fitted with curtains on rollers to help preserve them (117). Minutes of 1859 contain a report by the curator which detail the full extent of his

achievements since entering office as 'conservator' in 1854.

Within the space of five years Stewart had "...reduced the Museum to order...", organised a catalogue of its contents and labelled 950 objects (118). All of this shows a sincere commitment on behalf of the Trustees toward education, conservation and accessibility.

A record of visitor numbers between 1858 to 1864 illustrates that the museum was well patronised, and that phrenology was of considerable interest to the general public during the third quarter of the nineteenth century. An average of 868 visitors are recorded in attendance at the museum per year between these dates, and the figures show a steadily increasing number of people using the facility throughout this time (from 731 to 1175 per year between 1858 and 1864) (119).

During the course of 1867 the Trust was given the chance to buy the collection of the late Prof. Spurzheim. Spurzheim was one of the most influential figures in the study of phrenology and he had amassed a huge collection of skulls and casts. The purchase of such a collection would have necessitated a major expenditure both in terms of the initial outlay and the cost of creating space for it in the museum. No decision was made on the matter until 1870 when a large part of it was bought (120).

In the three year period between the Trust first being offered, and then actually purchasing, Spurzheim's collection, they had been negotiating, unsuccessfully, the transfer of the collection to the Royal Infirmary. The exact details of this, of who was the protagonist or what the conditions and motives were, are not made explicit in the Trust's minutes. Yet there is a serious anomaly

between this and the Society's plans for growth and expansion which included both the acquisition of the Spurzheim collection and the building of the Phrenology Mueum on Chambers Street just two years later. To some extent it prefigures the ultimate fate of the museum on Chambers Street even before it was designed, built and occupied.

PHRENOLOGICAL MUSEUM OF THE HENDERSON'S TRUST, CHAMBERS STREET,
EDINBURGH

The issue of purchasing land on Chambers Street in order to build a new museum was first mentioned in July 1872. The trustees felt it politic to relocate the museum in a more public and salubrious part of town. Chambers Street offered the perfect site; Francis Fowke's Royal Scottish Museum was under construction, and Adam and Playfair's University of Edinburgh New College already occupied a large part of the eastern end of the street to the south. It was a prestigious location where the Trustees resolved to "...build commodious premises for a museum with lecture room and accommodation for the Curator, and Shops on the Street Floor which might be let to advantage" (121).

Within the year the committee had progressed with the project to the extent of having commissioned the City Architect, David Cousin, to draw up plans for a building to be erected to the west of the proposed New Watt Institute (122). Six months later, in February 1874, minutes of the Henderson Trust indicate the scheme had undergone serious revision, and that the building was to be a joint venture between the Institute and the Trust. The same site was to be used but Cousin adapted his original plans to provide a building that could house both institutions. With the decision to cooperate with the Institute, any intention to use the ground floor as rental property for commercial ventures was abandoned, and it was proposed that the museum would occupy the ground and basement floors, with the upper part being given over to the Institute (123).

An agreement between the two bodies was finalised in October 1874 and, at some point between July and October 1874, the Directors of the Watt Institute purchased the plot of land on Chambers Street for £40 (124). Cousin was present at the same meeting in October 1874 and presented further amended drawings for that part of the building to be occupied by the museum. These were approved during the same session and Cousin was authorised to seek tender for construction. As city architect, Cousin was clearly the most suitable candidate for the project and, since he had designed the Museum and Classroom of the Reid School of Music (1858 - 1860), he was also familiar with this particular architectural typology.

Concurrent with the finalisation of the design of the museum were the negotiations between the Trustees of the Henderson's Trust and the Directors of the Watt Institute. Discussion had taken place prior to the October meeting with regards title of the land, building, and on the subject of the Trust making a loan to the School. This was finalised with an agreement that involved the Trust lending the School £2,600 to defray the costs for their part of the building. As security against this loan the Trust were to have sole title of the plot and building pending repayment (125).

With this agreement in place the committee assigned by the Trust to oversee works designated £2000 for the museum (126). The museum at Surgeons Square was closed c. February 1875 and a notice posted in the *Scotsman* to that effect. The Minutes do not record when construction started but work must have been considerably advanced by February 1876 since the committee were

discussing with Cousin the design of the display cases, and the materials to be used in their manufacture. What decision was made on this matter is not recorded either but the Trustees expressed the opinion that "...Wood Work of the Cases should be of Pitch Pine, that the shelving of the Wall Cases should be of Wood, that the plan should embrace suitable Cases for the front window, and that as regard the Centre Cases, the subject of Glass shelving should be carefully considered by Committee, particularly as to strength before finally deciding thereon."(127). During the same meeting in February 1876 a special committee was set up to consider how best to organise transfer of the collection from Surgeons Square, and in order to deliberate on the future care of the collection.

By December of 1876 the Museum was completed and a meeting of the Trustees convened at Chambers Street which was still empty and awaiting the transfer of the contents of the old museum.

All that now exists of Cousin's museum is the shell. The interior was completely rearranged in later improvements. However, something of the appearance of the museum can be ascertained from three of Cousin's drawings that still survive which are dated December 1874 (128) (Figs. 40 & 41). The drawings are of the front and rear elevations and of the ground floor plan. Unfortunately no cross sections survive and there are no details of the arrangement of floor cases.

The front elevation is a two-bay addition to the Watt Institute of four floors with a free Renaissance facade and a French roof. The facade of the ground floor comprised an entrance with a canted bay window to the left. The keystones of the three windows

of the bay and the entrance were embellished with sculptured heads depicting prominent figures of the science of phrenology. Further decoration was offered in the deep horizontal channelling and coupled pilasters either side of the canted bay. The museum was recessed slightly from the street with a light-well to the basement so that the entrance was reached via a short arched flyover from the street. The entrance led into a small vestibule from which only the museum was serviced.

The museum occupied all of the ground and basement floors in a 50'6''x 20'6'' space. A spiral dog-leg stair, situated in the middle of the east wall, gave access to the basement. The plans clearly show that this staircase led down to the basement but did not ascend to the apartments above. This arrangement allowed the two to be completely distinct from one another. There was no door communicating between the School and the museum on the ground floor so that the museum could only be entered from Chambers Street and the small door in the basement, to the rear, from Scott's Close.

Where the span was at its widest on the ground floor, towards the rear of the museum, the ceiling was supported with encased iron columns. There is no mezzanine indicated on the plans and the first floor did not have sufficient height to allow for one.

There is no indication on the plans of any space being set aside for a curator's office, classrooms, lecture rooms or cloakrooms. It must therefore be assumed that the society held its meetings and lectures in the museum room itself, and that a portion of the basement was possibly set aside for curatorial activities. This was in contrast to the Surgeon's Square museum which had a number

of lecture rooms from which academics ran classes and where the Phrenology Society met. That the Trust did not make provision for teaching facilities is some indication of the lack of demand for instruction in the subject.

Both museum halls were entirely side lit from an assortment of windows to the north and south on both floors. There was also a lunette window above the entrance from Chambers Street that admitted light into the vestibule.

Exactly how the display cases were arranged is not known. Fixed glass-fronted cases lined the walls and there were free-standing cases on the floor arranged in the same way as they were at Surgeons Square. Although the basement area was marked as a museum on Cousin's plans it is not known if it was actually used for that purpose since it was to be offered to Stewart for his bookbinding workshop.

The total cost of the museum, as reported in the *Scotsman*, December 1887, was £2,810 (129). Since the funds originally designated in 1875 for the project were just £2,000, the museum came in £810 over budget.

Stewart was assigned to oversee the removal of the collection but it is interesting that two of the Trustees were elected to search out a suitable candidate for the new curatorship. Since Stewart had been offered the use of the basement for a bookbindery in February 1876 one can only conclude that the Trustees intended to split his job and create two separate posts (130). Prior to this Stewart had acted both as librarian and curator, and it was obviously felt that two people were needed to carry out the work.

Less than three years after the museum officially opened, the minutes record in 1870 the first suggestion that the Trust is experiencing financial difficulty with a statement that "...the annual income is now insufficient to meet the annual expenses." (131). Furthermore, by the end of that year the Trustees were engaged in a legal action with two relatives of the late William Ramsay Henderson. These two individuals took out an action against the Trustees which challenged their use of the residue of William Ramsay Henderson's Estate. They were clearly questioning the validity of phrenological enquiry, and felt that the money should be used "...more in accordance with modern science than the present administration." (132). They attempted to freeze the Trust's funds until the matter was resolved in an effort to stop the Trustees wasting any more money on a defunct science. This necessarily put enormous pressure on the Trustees who were responsible for the upkeep of the museum. The impasse was resolved by the acquiescence of the Trustees who offered a compromise. They agreed to accept one of them onto the Board in order that he would facilitate "...the development of the Trust in useful directions." (133). This implies some sort of an admission that phrenology was not 'useful' and ultimately led to the eventual deaccession of the collection and the sale of the museum.

In December 1882 the Trustees were planning to offer the collection to the new Industrial Museum, Chambers Street, and the premises to the School of Arts (soon to become the Heriot-Watt Institute). Minutes of the following year indicate that the Keeper of the Industrial Museum was not interested in the

collection. In the same minutes comes the first explicit admission that phrenology has been discredited as a science and was no longer deemed a useful avenue of intellectual enquiry :

The Trustees deliberated as to the course that ought to be followed and they were of opinion that as the Museum had not fulfilled the intentions of the Trustees and at present [required] a sum greater than they considered its usefulness qualified it was expedient it should be closed in course of time and the contents transferred elsewhere. (134).

Between 1885 and 1886 the Trustees negotiated with Professor Turner, head of the Department of Anatomy, University of Edinburgh Medical School with regards transfer of the collection to the University (135). Both sides agreed to the various conditions and a formal agreement was made between the two in March 1887 (136).

There is no entry in the minute books regarding the sale of the museum building to the Heriot Trust but detailed accounts of the Trust from 1900 contain a break down of all expenditure on the museum from 1885 - 1900. Included in this is an annotation which mentions the sale in Nov 1886; "The Museum Buildings in Chambers Street stood in previous accounts at the cost price of £2820:5:4. They were sold to the Heriot Trust at 11 Nov 1886 for £1800" (137).

THE OLD HUNTERIAN MUSEUM, UNIVERSITY OF GLASGOW

The Hunterian Museum of the University of Glasgow has been housed in two different buildings since it moved to Scotland in the first decade of the nineteenth century. The collection was bequeathed in 1783 by William Hunter, a former student of philosophy and language at the University and latterly a successful medical practitioner. Hunter was particularly interested in anatomy and collected zoological specimens for teaching purposes. When he bequeathed his collection to the University, with sufficient funds to build a museum, it was his express intention that the museum be used for lectures and that it should be open to the public (138).

The Old Hunterian was designed in 1804 by William Stark (139), an influential architect of the post-Adam Greek Revival, although his design for the Hunterian was predominantly Roman. He designed the Old Hunterian following a limited competition that involved only himself, David Hamilton and Peter Nicholson. Despite not being involved in the official competition, Robert Mylne had also produced designs for the museum as early as c.1799.

Stark's work was much influenced by architects working in England, particularly Sir John Soane (1753 - 1837) and his pupil Robert Smirke (1780 - 1867) the latter of whom was one of the leading exponents of the Greek Revival. His design followed the Roman neo Classicism favoured by Robert Adam and is Roman Doric externally, and Greek Ionic internally (Figs. 46 & 47).

It was a compact structure built on sloping ground and comprised two main storeys with a basement which, because of the slope, was

entered at ground level from the rear (Figs. 42, 43, 44 & 45). This slope allowed the basement to be illuminated by natural light from a series of windows. On the first floor the octagonal picture gallery was top-lit from a shallow dome mounted on a tall drum structure. The two rooms which flanked the picture gallery were also lit from the central cupola. To the rear of the building was the library, the main body of which opened into the octagon and which received light from the same source. The octagonal room on the ground floor, which housed the natural history collection, was lit from nine windows in the rooms adjoining it. The rectangular room to the rear of the building on this floor housed the anatomy collection. The same method of lighting was used for the basement. In order to maximise the flow of light from the dome on the first floor and the windows on the ground floor the octagonal rooms had four very wide openings. The dome was supported on columns rather than solid walls, similarly the first floor octagon was supported on columns in conjunction with solid masonry. The overall effect is one of elegant simplicity.

During the 1870s the Hunterian was demolished by the Glasgow Union Railway Company.

Stark's Museum was the first purpose-built university museum in Scotland and in 1804 there was no established precedent for the architecture of public museums that housed permanent collections.

During the eighteenth century country and town houses throughout Britain housed purpose-built private picture and sculpture galleries. Purpose-built gallery spaces were also constructed during the late eighteenth and early nineteenth century for the

temporary shows of the Exhibitions and Academies, and for the London-based commercial galleries and auction houses.

However, the sort of space required for exhibiting these two types of collections was very different to that necessitated by a large, varied, permanent collection like Hunter's which was intended as a public resource.

There were in fact very few models for this architectural typology; at Oxford University there was Thomas Wood's Ashmolean of 1683, and Robert Adam had designed a museum space in his New College scheme for Edinburgh University in 1789 (Fig. 9). Neither of these two seem obvious precursors to Stark's Hunterian which is a free-standing, temple-type building centrally-planned around a dome which provided top light to the principal room.

In London George Saunders had designed the Townley Gallery for the British Museum in 1803 (Fig. 98). Saunders' Gallery was an extension to the west of Montagu House running from south to north parallel with the west wing. It comprised a single storey museum 'corridor' of enfilade rooms which led into a two-storey gallery building. The former was top-lit from two small domes and a series of domical sky-lights. The principal gallery on the ground floor was side-lit from windows placed high in the east and west walls. The first floor gallery above this was also side-lit.

The Townley Gallery is a possible source for the Hunterian which uses the very open enfilade arrangement of rooms, and top lighting to maximise wall space for the display of objects (140).

It is also possible that Stark was inspired by a building which he saw during his visit to Russia. Although there is no obvious

precedent in the neo Greek idiom, it may be that Stark was inspired by the neo classical Academy of Arts, St. Petersburg (1765 - 1789) (Figs. 102 & 103).

Stark's use of the 'temple' was an original concept which was much repeated over the next hundred years.

Museums and galleries based on the centrally-planned, classical temple became the accepted norm throughout the nineteenth century; some examples are: Barry's Royal Institution, Manchester (1823); Schinkel's Altes Musem, Berlin (1823); Wilkins' National Gallery, London (1832); Basevi's Fitzwilliam, Cambridge (1837); Cockerell's New Ashmolean, Oxford (1841) and Playfair's Scottish National Gallery, Edinburgh (1850).

THE NEW HUNTERIAN MUSEUM, UNIVERSITY OF GLASGOW

Plans to relocate the university in new premises began in 1845. The Professors of the Faculty were approached by the Glasgow, Airdrie and Monklands Junction Railway Company in that year who offered to buy the university site in the High Street, and fund the erection of a new college building on Woodlands Hill in the east end. Nothing came of this scheme at the time, and it was not until the 1860s that the sale of the Old College enabled the university to acquire its splendid new college at Gilmorehill (141).

Although never realised, the original scheme at Woodlands Hill deserves some discussion since it is quite clear that, in his designs for the college at Gilmorehill, Scott was inspired by Baird's designs of the 1840s.

A Glaswegian architect, John Baird, was invited to draw up plans for the college scheme in 1845 (142). This first set of designs, and the later amendments, were produced during the first six months of 1846. They depict an 'E' shaped building with the principal elevation to the east. The front elevation was dominated by an ornate projecting central pavilion from which there rose a square tower with pinnacled stair turrets to each corner. Neo Jacobean in style, the scheme borrows from a number of different sources but is heavily dependent on Heriot's Hospital. Screens on the west side closed off the two open courtyards.

The north and south courts were defined with a block that housed

the library on the ground floor and the museum above it (Fig. 48). Both library and museum were long, narrow, galleried halls, c. 135 x c. 55 ft.. Each space was divided into 12 bays on either side.

These bays were defined by Ionic columns that supported the mezzanine and ceiling. The cases would have been arranged in carrels, with a window to each bay on both the principal and upper floors. Additional light was admitted into the museum from skylights in the barrel-vaulted ceiling.

Alterations were made to this first design following criticisms from the professors of the Faculty and following the advice of Edward Blore. These changes concerned the construction of the library and museum but did not affect the overall layout or style of the scheme.

For a number of different reasons Baird started on a new design in 1846. The plan of this second design was a double quadrangle with the principal elevation to the east. Instead of the screens to the west, the courtyards were more emphatically closed off by a range of buildings. The museum and library remained in the same place as in the original but were extended into the central portion of the west range. The professors of the Faculty had considered the library and museum insufficiently provided for in the first design. Baird's addition of a 'transept', in the west wing, to the museum and library significantly increased the space of both: the main hall was 145 x 50 ft., and each wing was 33 x 33 ft..

Once again the style was a mixture of Italianate and Scots Renaissance, although the two were not so finely blended as they

had been in the first scheme. The style and internal arrangement of the museum changed very little from the original: the mezzanine and ceiling were supported on rows of Ionic columns, it had the same lighting arrangements, and the museum was situated on the top floor above the library (Fig. 49).

Baird's second scheme followed the same fate as the first. The professors of the Faculty sought the advice of Pugin and Barry on both of the designs. They found fault with almost every aspect of the proposed college including the style, plan and internal arrangement of space in the library and museum.

Following suggestions made by the two London architects, Augustus Pugin and Charles Barry, Baird conceived a third scheme in 1847. In style this was very close to the second design, and the tower above the central pavilion was retained. The plan, however, was drastically revised with the omission of the range of buildings that bisected the quadrangle, and the lengthening of the north and south wings (Fig. 50). The library and museum were placed, one above the other, on the ground and first floors of the west wing in two galleried halls of c. 195 x 50 ft.. The relationship of the library and museum spaces was thus very similar to that envisaged in the first two schemes. Despite this final reworking, following the advice of Pugin and Barry, Baird's third design was again disapproved, this time because it was found too costly. Edward Blore was called upon to redesign the elevations in a less elaborate, and therefore more affordable, style (Fig. 51). Blore completed his drawings in 1849 and these, along with what remained of Baird's third design, were approved in the same year.

As a result of the inordinate amount of time it had taken to agree the design of the new college, and because of financial problems, the whole scheme was abandoned. The existing college was renovated and the university remained in its premises on the High Street until the 1860s (143). When the plan to relocate was eventually revived, the university commissioned a different architect to design the new college.

In 1863 an Act of Parliament was passed allowing the college to sell the old university site and move to Gilmorehill on the west side of the city. George Gilbert Scott (1810 - 1878) was commissioned to draw up plans for the new university buildings (146), to which end he visited Glasgow in 1864 to receive instructions from the building committee (145). During the following twelve months the committee sent him details of the internal arrangement of the accommodation required. Scott received measurements for the classrooms, laboratories, the museum and library, and suggestions as to the space required by the different faculties from the relevant professors. Work started in 1866 and it was agreed that the building would progress in four stages (146). The first two were to be (a) the south front and western side of the north front (including the Library and the Hunterian Library), and (b) the Hunterian Museum. It seems obvious that Scott was much influenced by the designs of Baird for the college. Although there are no similarities of style, Scott's plans follow those of Baird's second design in the double-quadrangle and clocktower arrangement (Figs. 52 & 53). The allocation of the majority of the west range for the library and museum was taken from Baird's last design, although in Scott's

version the division of space for the two is quite different (Fig. 54).

Scott's style was very individual and described by the architect himself as one of his own invention, a "... thirteenth or fourteenth century secular style with the addition of certain Scottish features." (147). Between them the library and museum occupied the entire first floor of the north range of the quadrangle and the ground floor of the western side; the library to the west, and the museum to the east (Fig. 55). They occupy seven bays each and are both surrounded by a gallery to all four sides. The museum entrance hall is an apse-ended space accessed by a wide, ornate polychrome staircase decorated with different coloured marble (Fig. 56). This was constructed at a later date (By John Oldrid Scott. The stone staircase replaced a temporary wooden one.).

The following description of the Hunterian is based partly on a precis of Scott's own account included in Allen Thompson's report *University of Glasgow New Buildings*. It is a description that is used for both the library and museum since the two are virtually identical spaces different only in minor detail (Figs. 57 & 58). The style of the college is based on that of works of the thirteenth and fourteenth century, subject to modifications which introduce Scottish vernacular themes. "It is not a style that would have prevailed in Scotland during the fourteenth century but it quotes French characteristics which were worked into Scottish architecture at a later date, and which came to be received as the style of the country ... The north range is divided into five parts; angle blocks form towers to the east and

west, and a central block of lower elevations ... The Library and Museum are alike in design. There are two great halls in each, occupying respectively the ground and first floors, these being 129 x 60 ft.. The lower hall is in each case of a simpler, and the upper of a more ornamental, character. This storey is 52 ft. high., and is supported by ornamental columns of iron, behind which each are galleries on either side." (158).

The space is divided into fourteen bays by the iron columns, with a window to each. The cast iron columns supporting the roof form clustered piers at the lower level of the upper museum and paired cylindrical shafts at the gallery level; the upper part of the gallery piers are decorated with a repetitive geometric design. These slender columns are surmounted by gothic capitals (Fig. 59).

Above the central well and the north and south aisles the timbers of the wagon roof are left uncovered although the space between the rafters is panelled. The entire roof structure rises from the capitals of the cast-iron columns and from braces and corbels in the walls.

Both the museum and library floors of these buildings are fireproof; formed of iron beams, the spaces between them being filled with concrete. Similarly the doors communicating between the library and museum, and the various departments to the extreme east and west are of iron and fireproof. The entrance hall to the museum and library at the top of the stair housed the Hunterian Library. On either side of this the museum and library occupied two large halls, identical in all respects save the addition of an internal stair that connected the lower and upper

library halls in the south-east corner. When the collection of the Old Hunterian was removed in 1870 it was housed in the attics of the new buildings until the furniture was fitted. This was made by cabinetmakers James Weir and James Barr of Glasgow. The museum furniture is described in Allen Thompson's abridged version of Scott's account:

"Owing to the peculiar construction of the Hall, in which a range of pillars is placed between the body of the Hall and the aisles, it was found necessary to construct cases upon a special plan in conformity with the divisions made by these pillars; and thus it was found expedient for the proper exhibition of objects to place in the space between each pillar and the wall glass so contrived, that, while the outer part is completely enclosed by glass, and fitted with brackets and shelves for exhibition, there is a vacant space in the interior which admits of the keeper entering for arrangement of the specimens in their places." (149).

There were eleven cases in total (10 ft. long, 5 ft. 6 in. deep, and 10 ft. high) of which the upper part was covered with glass, and the lower part filled with drawers. They were arranged in carrels. Free-standing double table cases (15 cases @ 12½ ft. long, 11 cases @ 7 ft. long) were also used for display on both the main and gallery levels.

The museum was lit by a range of seven windows on both the main and gallery levels to the north and south. In addition, light was admitted from decorative rose-windows set high into the east and west gable-ends. The anteroom between the museum and the entrance hall held ethnographic specimens in presses and cases. The

Hunterian Library Hall (entrance hall) was a rectangular space with an apse to the north, and side aisles to the east and west. It was lit from five very large windows that occupied most of the apse and two roof lights in the canted ceiling of the side aisles. The hall was lined with bookcases (9½ ft. high), and further accommodation was provided for books on the floor in double bookcases (4½ ft. high).

In addition to the main museum hall of the Hunterian Museum there were other museum rooms in the college. To the east of the Hunterian were two rooms housing the natural history, surgical and Hunterian anatomy collections. The University Court Room was also designated for the Universities collections of antiquities and coins.

As an ardent neo gothicist Scott championed the gothic for almost every type of public and private building. Although there was a well-established tradition of using the classical for museum buildings throughout the nineteenth century in Scotland and England, Scott's use of the gothic for a museum of this type did have precedents in museums connected to educational establishments, particularly when part of a larger collegiate scheme. Scott's Hunterian bears similarities to two such museums in Aberdeen and Oxford.

Archibald Simpson's Gothic Revival Marischal College was designed over thirty years before the New Hunterian (Fig. 4). As at Glasgow the museum and library halls were virtually identical, paired, first floor spaces separated by an entrance area. In both cases the halls were galleried and side-lit. The interiors of the two are however quite different. At Marischal College the narrow

cantilevered mezzanine is little more than a walkway with a simple, almost delicate metal balustrade. The interior of Scott's Hunterian has considerably wider galleries which, to the north and south, run behind the cast iron supports of the roof forming side aisles on both the upper and lower levels. In addition, the gallery has a solid, obvious balustrade and the structural components of the building are revealed and enjoyed. Scott used some of the most modern iron construction technology in erecting this building and does not disguise it. The effect produced gives the museum a solid and heavy appearance. Simpson's Marischal Museum cannot match the solidity of construction seen at the New Hunterian.

The other obvious inspiration for the Hunterian is Woodward and Deane's Natural History Museum for the University of Oxford (1855 - 1860) (Fig. 96). Like Scott's building it is a very fine example of the high-Victorian Gothic. Although called a 'museum', a significant portion of the building was given over to house various departments and associated class and lecture rooms. The museum occupies the central court of the building. It is a vast space with a glazed roof which rests on large numbers of tall, slender, clustered cast-iron supports. As at the Hunterian these structural components are elaborate and beautifully decorated with wrought-iron detail. Woodward and Deane made no attempt to disguise the nature of the principal structural members of their building, and Scott's New Hunterian is similar in finding itself unembarrassed in its use of iron.

The New Hunterian is the only example of an English architect being commissioned to design a university museum or gallery in

Scotland, and his presence was widely resented at the time as "... an invasion from the south." (150). Scott died in 1878 and his son, John Oldrid Scott (1841 - 1913), oversaw the completion of the Bute Hall and Hunterian stair section of the Gilmorehill project.

The interiors of both the library and museum have survived with only a small number of changes. The museum still holds part of the university collections, although zoological, anatomical and botanical specimens were removed during the first two decades of the twentieth century. The university library is now housed in a 1960s building on the north side of University Avenue and the original library space allocated to the museum.

MUSEUM OF THE ANDERSONIAN, GLASGOW

John Anderson (1726 - 1796) established Anderson's University through his will of 1795 in which he made provision for a democratic, forward-thinking institution. As envisaged by Anderson it was managed by 81 trustees drawn from a wide cross-section of society. The Institution was intended as a radical alternative to the exclusivity of Glasgow University. This establishment, committed to the instruction of the working classes in science subjects, was liberal and populist, and did not discriminate on grounds of gender, class or religion (151). Included in Anderson's legacy was a library and museum collection which included scientific apparatus, natural history and geological specimens, ethnography, and antiquities.

The University was originally housed in rooms rented from the Grammar School in George Street. In 1798 the Institution moved to the Fleshmarket on John Street. Although designed as a market the building was never used as such and was purchased by the Trustees in that year for £2000 (152). Thirty years later the Institution needed to expand and at the same time was approached by the Bank of Scotland which wanted to buy the John Street site. During the course of 1828 the managers of the Trust negotiated selling the Fleshmarket to the Bank for £5000. Conjoint with the offer for the John Street site was the appearance on the market of the premises on George Street in which the Institute had originally started out. The Trustees resolved to purchase the Grammar School and bought it in 1828 for £3000 (153).

John Craig had designed the Grammar School in 1787 - 88. It was

a simple neo-classical quadrangle entered from the rear of the premises. On gaining title the Trustees of the Andersonian decided to make significant alterations and additions to render it fit accommodation for a University. The architects chosen to redesign the School were James Watt and Robert Scott. This partnership had advised and made designs for the Institute for some years prior to the move to George Street, and had been involved in a proposed extension and improvement scheme at the John Street site (154).

Scott and Watt enriched the George Street facade of the building with an Ionic portico, and the internal space was rearranged. A significant extension was built to the rear on the Grammar School's playing fields, purchased separately from the building. Whilst Scott and Watt are the architects credited in the minutes as the architects, a history of the Institution by A. Humboldt Sexton attributes the design to James Smith of Jordanhill (155). This is further backed up by a reference in the minutes of 22 March 1830; "Mr Smith laid before the Meeting a Prospective of the Library and Museum which was approved. " (156). In the following month it is stated that "Mr Smith laid before the Meeting sketches of the (new) proposed new apartments for the Museum and he was requested to get Mr Scott to make working plans and give them out for estimates..." (157). Smith was a fellow of the Royal Society and was President of the University from 1830 to 1839. He seems to have been instrumental in pushing the University to build a museum for Anderson's collection which, since the year of his death, had grown from a number of different donations and bequests.

The extension was a circular building (52 ft. in diameter) roofed in with the dome from the fleshmarket which the Bank of Scotland had agreed to sell to the University for £300 (158). The lower part of the addition was fitted up as a lecture room that seated 400 people; the upper part housed the museum under the dome.

Although no plans or drawings survive two pictures of the interior of the museum give a clear indication of the space as it was designed. The first is a watercolour by John Gilfillan, Professor of Painting and Drawing at the University from 1830 (159) (Fig. 60). There is also an engraving by Gray & Son after a drawing (c.1830) by Robert Hart (160) (Fig. 61).

These two pictures are very close in what they depict, and serve to back one another up as accurate documentation. Both views are taken from the same vantage point on the principal floor of the museum. The room was a circular space with a narrow gallery supported on ornate console cantilever brackets. Its soffit was decorated with ornate plasterwork. A wide double-return staircase led from the principal floor to the gallery. To either side of this were doors leading into cabinet rooms. The room was lit from glass lights in the dome and from windows on the principal floor. Specimens were displayed in fitted, glass-fronted cases around the walls on both floors. An assortment of free-standing table cases was arranged on the main floor. Because the space was circular the floor cases were arranged somewhat awkwardly. The easy compartmentalisation of space that a rectilinear room allows of is much more difficult to obtain in a room of this geometry.

Both pictures depict what appears to be a circular, glass-topped

display case in the centre of the room. However, according to Sexton's description of the University's buildings this was a glass-topped lantern which admitted light to the lecture theatre below. (161). Although domed and galleried central spaces had featured in several Scottish country houses at this time, this constitutes quite an eccentric solution to the problem of lighting a lecture theatre, and was certainly unique in the history of Scottish university museums. A lantern-light, rather than a light-well would have been necessary to avoid noise travelling from the museum to the lecture hall.

Sexton's account of the Institute's buildings in the late nineteenth century suggest that there was, at some point between 1830 and 1890, a drastic reorganisation of the internal space in the museum. This is corroborated by archive photographs from c.1890 (162). The lecture hall was given over to the museum to provide extra display space for the growing collection, and the greater part of the lecture hall ceiling was removed so that the museum hall now rose through two floors from the ground floor to the dome. Part of the first floor was left to provide a second gallery. This level, and the upper gallery of the original museum, were now carried on a series of Ionic columns. The lower section of the staircase to the upper gallery was also remodelled; the single flying stair, which rose at 90 degrees to the gallery, was replaced by two, narrow flying stairs which ran parallel to the gallery. The upper section of the stair remained the same and rose from the landing in a double-return. These photographs also show that the dome was reconstructed at some point during the period 1830 and 1890. Exactly when these

alterations were made is not clear but a catalogue of the museum's contents from 1865 make mention of a ground floor, upper floor and gallery which would tend to suggest that the ground and first floors were still separate spaces at this time (163). Between 1865 and 1894 the museum gave over the ground floor to house the library.

ANATOMY MUSEUM, UNIVERSITY OF GLASGOW

The anatomy department was designed and built by J.J. Burnet and J. Oldrid Scott in 1900 - 1901 (164) as part of an extension programme at the University which also included the erection of the departments of botany and engineering. Sir John James Burnet was the 'son' part of the Glasgow based firm Burnet, Son and Dick. He was an obvious choice for the project since his academic background involved the study of museum architecture whilst travelling on the Continent in 1895. He had also researched laboratory design in the United States from 1896 onwards (165). Scott's links to the university as an architect were well established; his father was the architect responsible for the Gilmorehill scheme, and he completed the project after Gilbert Scott's death in 1878. Burnet and Scott went on to design the departments of botany (1911) and zoology (1922).

Both the department and its museum were housed in the eastern range of the new college until the Smith Bequest (1900) provided £10,000 towards the cost of furnishing the department with more salubrious accommodation. The bequest was augmented by donation and subscription (166).

The new anatomy department was essentially an extension to Gilbert Scott's new university, tacked on at the northern-most point of the east wing and with little or no attempt by the architect to imitate or sympathise with the existing structure in terms of style or proportion. The front faces north and externally it is a relatively unremarkable edifice, combining neo Gothic with Scots Baronial (Fig. 62). There is no grand

entrance, indeed the main point of access from the exterior is an apologetic side door (Fig. 63). Despite this somewhat misleading exterior, the museum that it houses is a superbly grand and handsome affair.

The department is 'T' shaped in plan, with the museum occupying a c.65 x 45 ft. space to the south (Figs. 64 & 65). The area to the north is given over to teaching laboratories and private accommodation. A corridor which runs west-east on the ground floor from the entrance gives access to the classrooms and main stair (north), and to the museum (south). The main stair, which leads to a similar corridor on the first floor that also provides entry to classrooms, private apartments and the gallery of the museum, is functional and similar in style to those of the department of botany. It is a narrow half-turn stair with metal newel, handrail and balusters; the newels are decorated with a simplified cupped claw and cannonball. This detail is the only attempt at continuing the Scots Baronial theme of the exterior into the interior.

On the ground floor the museum has three points of entry from the corridor, the central pedimented door is flanked with attached pilasters. The section of the gallery balustrade immediately above this is significantly more decorated than the rest, emphasising the main museum entrance. The museum rises through the full height of the building and is surrounded by a gallery on all four sides. Free-standing columns support the principal components of the roof and the gallery, and rest on disproportionately tall, square plinths, encased in wood panelling. The gallery is reached from the first floor corridor

via two doors to the north. Furthermore, there are four very narrow, wooden straight-stairs from the principal floor of the museum at each corner.

A combination of both natural and artificial light was used to illuminate the space. Top light was provided from a series of five pitched roof-lights which run from east to west across the ceiling of the central well. Of these, four are relatively large and glazed so as to admit only north light, while the fifth, southern-most roof light, has a much shallower pitch and is glazed both to the north and south. The light is not diffused by lay-lights. Three windows to the main bays on the western side gave side light to the ground floor.

Display cases were arranged in carrels in five bays on the ground floor underneath the gallery. These fixed cases ran the entire height from floor to the underside of the gallery. Further display cases lined the walls of the mezzanine and the gallery balustrade supported glass-topped table cases. The original furniture of the gallery balustrade has been replaced and added to with the most insensitive and inappropriate fittings that actually cut across the vertical of the columns, and which destroy the height and sense of space in the museum. The original cases, prior to refurbishment, ran in sections in between the columns rather than across them.

BOTANY MUSEUM AND HERBARIUM, UNIVERSITY OF GLASGOW

Burnet's second contribution to museum architecture was his 1911 botany museum (for wet specimens) and herbarium (for dry specimens) at the botany department, Glasgow (167). Like those in zoology and anatomy, the museums were housed within a larger departmental building which was a result of the increasing strain on the space at Scott's college as the department and museum expanded.

The building matches Scots Baronial with Scots Renaissance in an entirely pleasant and resolved symmetry (Fig. 66). Uneven fenestration gives the impression of regularity because of the architect's consideration to massing of masonry - the east and west sides of the structure are treated slightly differently to the exterior, according to the internal arrangement, yet preserve an aesthetic unity and hold the same overall weight. This flexibility is given by a very free and clever use of two styles; Renaissance entablatures sit quite happily between vernacular stair-towers and decorative corbelled stair-turrets. It is not an especially remarkable edifice but entirely successful in its own right; it doesn't express any particular purpose or offend in any way. Like anatomy it faces north on to University Avenue, and is a rectangular pile in terms of plan. The central entrance pavilion is decorated with classical detail on both the ground and second floors.

The two museum spaces are situated on the west side, and to the right of the ground floor entrance corridor.

(a) THE HERBARIUM

The herbarium held dry specimens and was situated in the north west part of the building (Fig. 67). A single door from the entrance hall serviced the space, which measured 40 x 35 ft (Fig. 69). A gallery ran around three walls to the north, south and east. The north section of this was significantly broader, and was carried on two cast-iron supports. A stair-tower in the south west corner gave access to the mezzanine. The same staircase also serviced the different levels in the museum and therefore allowed visitors to move freely between the museum and herbarium.

Three windows to the north, and one to the west admitted natural light to the herbarium both above and beneath the gallery. There was no top light. The cases were arranged in carrels of three bays (corresponding to the windows) on both levels to the north side where the mezzanine was deepest. Throughout the rest of the space, on the ground and first floors, specimens were displayed in fixed wall cases.

Very little of the original herbarium survives. The room was sub-divided during later twentieth century improvements, to provide two floors. However, the space left after the removal of the mezzanine wall cases is still in evidence.

(b) THE MUSEUM

To the south of the herbarium was the museum (Fig. 68). This was also accessed from the corridor on the ground floor, and from the stair-tower in its north-west corner (Fig. 69). A second internal spiral staircase to the south-east ran from the principal floor to the lower and upper galleries (Fig. 70). In

addition, a door from the second floor corridor gave access to the upper gallery.

Unlike the herbarium, the museum was arranged on a north-south axis and measured 52 x 34 ft.. The museum boasted a double mezzanine which is unusual in the architecture of Scottish university museums, and seen only in one other museum: Robert Rowand Anderson's earlier anatomy museum for the Edinburgh University Medical School. For no obvious reason the two galleries were set slightly lower than the level of the first and second floors in the rest of the building. Both mezzanines ran around all four walls; the lower gallery was slightly wider than that on the upper floor.

On the ground floor the collection was housed in a variety of free-standing and fixed wall cases. On both the lower and upper mezzanines specimens were displayed in wall cases; the galleries were too narrow to allow free-standing display cabinets.

Three four-light windows on the west side and a further two to the south lit the ground floor and lower mezzanine. The windows were bisected by the gallery. A smaller four-light window in the gable of the south elevation admitted light on the second floor. Additionally, eight lay-lights, running down the centre of the barrel-vaulted ceiling, provided top light. To the south the ceiling cuts across the top of the window which therefore lets in light both above and below the lay-lights. Simple square moulding along the cove between the lights and the top of the wall echoes the shape of the lay-lights.

The museum has been radically altered in order to make three separate floors. The ground and first floors have been

partitioned to provide numerous, small laboratory spaces. On the second floor, the upper mezzanine has not been divided into smaller units and acts as a departmental library. The south window and lay-lights remain intact, and it is still possible to get some sense of the original dimensions of the museum.

ZOOLOGY MUSEUM, GRAHAM KERR BUILDING, UNIVERSITY OF GLASGOW

The Zoology collection of the Hunterian Museum was moved to the new Zoology Building of the University of Glasgow in 1924. The core of the collection is therefore John Hunter's although it has been significantly augmented by donation from other private sources. The collection numbers 1.25 million specimens of which the majority are insects. Most invertebrate and vertebrate groups are also represented (168).

After a period of severe neglect, the collection and department were rescued from near extinction by the Professor of Natural History, John Graham Kerr (1869 - 1957). Kerr set about expanding the department, and the erection of the Zoology building is largely his initiative. He was a collector and museum enthusiast who had a love of teaching and who was responsible for the creation of a Zoology Department that far surpassed any other in Britain at that time in terms of both housing and equipment. Graham Kerr had studied mathematics, natural philosophy, geology, botany, zoology and medicine at Edinburgh University, and went on to study at Christ's College, Cambridge. He had a distinguished career which included expeditions to South America where, in his role as zoologist, he concentrated on ornithology, his own particular interest. His butterfly specimens still form part of the collection among which there are many type specimens. In 1902 he was appointed Regius Professor of Natural History which at that time included zoology, mineralogy, geology and palaeontology. In 1903 he was appointed first Regius Professor of Zoology, a chair he held until 1935 (169).

This building has been described by Gomme and Walker as an example of an architect designing from 'the inside out' (170); a legacy of the philosophy of both the Gothic Revival and the Arts and Crafts Movement. It is also a reflection of the increasing need for the Edwardian architect to create different designs that were specific to the use and users of a building. In this case the architect had to fulfil the specifications of science and scientists (171).

Burnet's Zoology Building has also been described as "Edwardian meets Functionalism" (172). This is undoubtedly due to the years Burnet spent studying the architecture of educational establishments in Europe and the United States. It has an asymmetrical exterior in respect of fenestration, height of elevations, roofline, plan and the massing of masonry. It is built of grey Northumberland sandstone with the front elevation facing to the east. The basement is decorated with very deep horizontal chanelling and the building comprises large areas of blind walls: the southern part of the eastern elevation, the west elevation, and part of the south elevation. The plan roughly describes a 'U' (Figs. 71 & 72). Between the east and west wings is a courtyard screen behind which was a compound for live animals.

The museum is blind on all four sides but to avoid the tedium of blank walls and the heavy mass of masonry to the exterior, the architect has introduced slightly projecting corner pavilions and decorative blind windows. Despite this the appearance of the exterior of the museum is still massive and austere.

Internally, the museum occupies a single-storey rectangular

space (122 x 75 ft.) situated in the west wing and orientated on the north-south axis (Fig. 73). The roof is supported on steel reinforced Tuscan columns which surround a shallow sunken well on all four sides. The well is approached by a flight of three terrazzo steps upon which the bases of the columns are supported. There are two entrances to the museum in the north east (from the elementary teaching laboratory) and north west (from the main corridor) corners. Heating is provided by two radiators occupying niches on the north wall and a further three pairs of radiators running down the centre of the well which were concealed beneath table cases. The museum was entirely roof-lit from four skylights, underneath which were laylights. Graham Kerr was well acquainted with the damage caused to museum objects by direct exposure to natural light and suggested the laylights be fitted with light-proof shutters. Since these proved too expensive Burnet advocated the use of deep wooden grilles (15 in.², 27 in. deep) which would diffuse light above the laylight and effectively block out all direct sunlight. Dick had consulted with "...the Astronomer Royal on the steepest angles of the sun's rays - all at the insistence of Graham Kerr who had a deep egg-box type of false ceiling placed under the rooflights of the museum to cut out direct sunlight from the exhibits." (173). The specimens were displayed in a variety of old and new cases. Cases were moved from the Hunterian and Messrs Sage installed glass and steel uprights that lined the walls and smaller free-standing cases with internal lighting. The basement provided ample storage for the large numbers of objects not on display. Steam and water pipes were routed so as to avoid the basement store and thus

ensure that it remained at a low temperature.

Graham Kerr's approach to education involved the use of specimens as teaching aids and he therefore placed great importance on the zoology collection and recognised the need for it to be properly accommodated. In accordance with this the museum was to display only those specimens that would be of use in teaching. The museum was not intended as a mere ornament with which to vaunt the possessions and achievements of the University; it was to be a necessary and functional appendage. "The restriction in size is justified by the belief that the series of exhibited specimens in a University Museum should be kept within rigid limits, nothing being shown that is not of distinct teaching value." (174). The building is therefore not built around the museum as an ostentatious showpiece as is clearly a formative motive in older, nineteenth century examples of the same type. Whilst being handsome and admirably proportioned, the museum is as practical as any of the classrooms and laboratories that form part of the whole. This is clearly seen in the approach to the museum space which has an unimpressive, almost casual entrance at an oblique angle from the north-east corner which says nothing of the exhibition space beyond it. This lack of pretension was criticised in a contemporary commentary on the building in *The Architects' Journal*: "One would expect a more ample and obvious approach." (175). The museum was open to the general public at weekends and it was clearly intended that it should be used by the population of Glasgow as a public building in the broader sense. "The primary function of the Zoological Collection is the instruction

of University students, but it is capable of playing an important part in spreading knowledge of, and interest in, biological science amongst the citizens who are not actually students. With this object in view the University Court has sanctioned the Museum of Zoology being opened to the public on Saturday afternoons from 3 to 5 o'clock." (176)

MUSEUM OF THE UNIVERSITY MARINE BIOLOGICAL STATION, MILLPORT HAVEN, ISLE OF CUMBRAE

The Marine Laboratory Station at Millport Haven was established as a collaborative venture between the Universities of Glasgow and London. However, the original impetus emanated from Edinburgh as the centre of oceanographic research. Dr. John Murray led the movement to establish a marine station for the study of marine fauna and flora following the Challenger Expedition of 1872 - 1876. In 1882 Murray approached the Meteorological Society of Edinburgh with a proposal for setting up a station. He offered to provide accommodation and equipment through private funding if the Society could donate an annual sum to run the station. This was agreed during the same year; Murray raised £3000 and a great deal of the necessary equipment, and the Society promised £300 yearly (177).

In 1883 Murray purchased a disused quarry in Granton that had been flooded with sea water. In this he moored an old lighter called the Ark which housed the laboratory. The aquarium, museum and further laboratories were accommodated in derelict buildings beside the quarry (178).

During the course of 1885, following a visit to the naturalist David Robertson on the Isle of Cumbrae in the Firth of Clyde, Murray decided to establish a branch of the station at Millport Haven. Research was carried out in the Ark which had been relocated there in 1885. Gradually this 'branch' succeeded the Granton Station which closed in 1903; the marine stations at Cumbrae, St. Andrews and Plymouth were far more successful in

commanding government funding (179).

As the Granton station fell into decline, and interest shifted to the work being carried out on the Clyde, Robertson promoted the building of a permanent onshore station at Millport Haven. The money for building and equipping the new station was raised almost entirely by private subscription from wealthy Glaswegian businessmen who were amateur marine naturalists. The foundation stone was laid in October 1896 and the building was officially opened in 1897 (180).

Between 1885 and the opening of the new station in 1887 the Ark was used as a museum and aquarium. Members of the general public were granted access to it six days a week for an entrance fee of 1d.

Erected on a north-south axis with the front elevation facing south, the new building was a simple, two-storey rectangular block (181) (Fig. 74). On the ground floor there were offices to the south, and a large research laboratory occupying half of the space to the north. The first floor was given over to house the museum, with a small room dedicated to the library at the north end.

A simple dog-leg stair led from the ground floor entrance hall to the south end of the museum. The museum was well lit from both windows and roof lights. There was a large semi-circular window in the south gable and a pair of tall, round-headed windows in the south end of the west elevation. It seems likely that the latter lit a small curator's office partitioned off from the museum hall. In addition a bank of sky-lights in the pitched roof provided top light. There was no ceiling beneath the roof so that

these lights admitted light directly into the museum hall. Since there were no other windows in the east and west elevation on the first floor it must be assumed that display cases ran continuously around the walls of the interior.

Of all the Scottish University museums covered in this work this is the most basic. It is a purely functional building which, to the exterior, resembles a shed for industrial machinery far more than it does a centre of learning and research. The interior is equally bare and there is nothing which is surplus to requirements.

Access to the museum for the general public was the same as it had been when the collection was housed on the Ark. The entrance fee was 1d, and, during the summer it was open six days a week. It was also open two days a week during the winter and for a few weeks over Christmas. Visitor figures from 1897 to 1905 demonstrate that, despite its small collection and remote location, the museum attracted a surprisingly large audience; between 5000 and 8000 per year (182).

During a period of expansion at the station in 1939 the museum collection was moved into the old laboratory space on the ground floor. The first floor museum now houses the library.

NATURAL HISTORY MUSEUM, UNITED COLLEGE, UNIVERSITY OF ST. ANDREWS

The core of the Natural History Museum dates back to the fifteenth century; it was a collection that was formed into a cohesive unit by the Literary and Philosophical Society in 1838. Although owned by the society it was housed in university buildings in a purpose-built structure designed by the King's Architect; William Nixon (c.1810 - 1848).

Robert Reid's (1774 - 1856) building to the east side of United College dates to 1829 - 1831. The north range was to be built following this but the grant that was to come to St. Andrews went instead to Aberdeen for Marishal College.

William Nixon replaced Reid as government architect and designed the north wing of the college (Fig. 75). Reid had submitted his own proposal for the United College site which never came to fruition with the reallocation of funds to Marischal College. Nixon completed the north range by 1849 (183). The building was designed by the government architect because at that time, like Aberdeen, all University projects were supervised, funded and controlled by the Government through the Board of Works; it is only in c.1860 that the University Court (formed by an Act of Parliament in 1858) had a role to play in such matters.

Following Reid's lead, the north range is neo Jacobean and copies the east range in spirit and style if not in exact detail. Although far simpler, Nixon's contribution is better proportioned and therefore more successful. The break in construction is highlighted in the very different coloured sandstone employed.

Nixon's building extends from Reid's to the west. It comprises a

three bay central pavilion with three bays to either side. The central pavilion is decorated with detached Tuscan columns on high pedestals either side of the entrance. Displayed above this are the Royal Arms of Scotland. The central pavilion projects slightly and is higher than the rest of the building so that it has a three storey elevation. The third storey attic runs the depth of the bulding from north to south and is lit from windows in the north and south fronts.

The museum occupied the entire first floor of the building to the west, and above that the third floor attic (Fig. 78). Fish-bellied beams support the principal floor of the museum (Fig. 79). These cast-iron beams were employed because of the huge span which needed to be covered, and the great weight that had to be supported. That they should be used at all is unusual since a span of that size would usually have been tackled with timber; they were also cast in one piece which required quite sophisticated engineering skills.

Interior photographs of the museum from c.1900 reveal that the collection was displayed in cases arranged in carrels to the north which formed five bays on either side corresponding to the four windows to the west of the entrance (Figs. 76 & 77). The bay to the east end on both the north and south sides was wider because externally it is the window to the west of the entrance in the centre pavilion. On the south side the walls were lined with fixed, glass-fronted cases that ran across the three western most windows. Four enormous pitched, glass-topped, apse-ended table cases ran down the centre of the floor from east to west. There were a further two octagonal table cases, reminiscent

of Playfair's for the Royal College of Surgeons Hall, that completed the furniture to either end of the museum. Four vents in the ceiling in the extreme corners provided ventilation from the upper museum into the roof. The third floor which was also used for display was accessed via a metal spiral staircase on the first floor landing.

Light was admitted from the large window in the west end, the four to the north, and from those parts of the windows left exposed above the wall cases on the south side.

During the 1840s the Government provided funds for an additional hall to house the collection. At the same time the museum was to be made increasingly available to students, members of the Literary and Philosophical Society, and the general public. As the collection increased in size an extension was proposed which was to be built to the west of the college (184) (Figs. 80 & 81). Nothing came of these plans and instead a completely new museum was built in St. Mary's College next to the new Bute Medical Buildings.

The additions originally proposed to the west of United College would have extended the first floor museum by an extra 61 x 33.5 ft.. It was designed with top lighting and although it would have had windows in its north and south elevations these would have been for purely cosmetic reasons since the cases were planned to run continuously around the walls. A mezzanine was also envisaged. If built, this extension would have been very much in keeping with the tradition of design considered most appropriate for the housing of university and municipal collections, and very much more specific to its use than the sort of multi-purpose

space of the extant museum hall, which was readily adapted to a number of different functions.

THE BELL PETTIGREW MUSEUM, UNIVERSITY OF ST. ANDREWS

A firm of local architects, James Gillespie and Scott, designed the new natural history museum in 1908/1909 (185). It was neo Jacobean to be consistent in style with their Bute Medical Building of 1897/99, and the adjacent St. Mary's College. The structure is rectangular in shape with projections to the north for a bay window and stair, and on the south side for a stair turret (Figs. 82 & 83).

Most of the building was given over to house the collection although some space was set aside to accommodate classrooms, preparation rooms and laboratories on the north and west sides of the ground floor. Two corridors led from the ground floor vestibule along the north and west sides, these gave access to the staircase, the museum and to the various associated spaces just mentioned (Fig. 85). A door from the ground floor north corridor led into the main museum hall (Fig. 84).

This was a 90 x 30 ft. space and rose through two floors to the ceiling. It was surrounded by a gallery around three sides (Figs. 86 & 87). The wall that it shared with the Bute Medical Building did not carry one. Gillespie and Scott's gallery is relatively unusual because it did not project into the ground floor museum hall, rather it sat back from it, and was supported on solid masonry rather than corbels, brackets or supports. The space beneath the gallery was occupied by corridors and departmental rooms outwith the ground floor museum hall. The roof above the gallery rested on a row of short Tuscan columns.

Specimens were displayed in continuous plate-glass-fronted cases

around all four blind walls on the ground floor, and in free-standing cases down the centre of the hall. These were commissioned specifically for the museum from Messrs. Frederick Sage & Co. of London. In addition, there were fixed wall cases, by the same firm of cabinetmakers, lining the west corridor, and a few cases of specimens along the corridor to the south. The cases in the museum were fitted with ground-glass tops to minimise the risk of light damage to the natural history specimens but were much criticised by the curator, Professor William Carmichael McIntosh, who failed to appreciate the conservation aspect of the design;

The roofs of these wall-cases...are covered with opaque glass, the only merit being that it does not show dust so readily as the transparent plates, for the notion that, in looking upward at the specimens, it forms a background is chimerical. The experiment may be tried on the floor-cases which have clear plate-glass on the roof. Moreover, in viewing the wall-cases from the upper floor the eye rests on a meaningless blank all round the hall - caused by the opaque glass, instead of the varied outlines of the contents. Besides, less light reaches the cases. (186)

On the first floor, the museum was fitted out with a combination of old and new cases. Fitted wall cases ran between the windows, and the gallery was wide enough to allow of free-standing cases running along its length as well. The enormous semi-circular ended table cases of the United College museum were carved up and recycled to hold specimens on the gallery floor.

Whilst McIntosh found much to criticise in the new museum, he

did acknowledge that the museum was well lit and declared that "On the whole the new museum has the advantage of roof-space and abundance of light in the main halls." (187). There were windows along the north, south and west elevations. A series of ground-glass lay-lights beneath six pitched skylights lit the museum well. These skylights were only glazed to the north. The principal museum hall had no side light; there were no gloomy corners caused by a gallery overhang to necessitate windows. The museum was also fitted out with electric lighting.

McIntosh's main point of contention with the decision to move, rather than extend, the museum was that it removed the collection from the centre of the campus and thus cast doubt upon its importance within university teaching. He considered that in being removed from the main hub of the college, and relegated to university extensions on South Street, the collection was no longer accorded the same level of prestige that it had previously enjoyed at United College; "...the museum [is considered] a useless appendage and not an educational establishment for the students and public." (188). It is easy to understand how McIntosh would perceive the university's decision as perfidy and treachery. Notwithstanding this affront he was also concerned that a resource which he understood to be a public one would become less accessible because of its relocation to an obscure corner of the college. It is clear that McIntosh's sense of ignominy encouraged him to find fault unjustly with what was a handsome and spacious museum which provided amply for the collection in every respect.

ANATOMY MUSEUM, BUTE MEDICAL BUILDING, UNIVERSITY OF ST. ANDREWS

Also by Gillespie and Scott is the earlier Bute Medical Building that housed the medical faculty (189). Built in 1897/99 it was to this building that the natural history was added in 1909. It was a Neo-Jacobean structure which faced south onto Queen's Terrace (Figs. 82 & 83).

The Gillespie and Scott plans show four separate museums spaces two each on the ground and first floors. Only one is identified as being specific to a particular subject: the anatomy museum on the east side of the ground floor. Two doors led into the space from the entrance hall and the corridor that ran between the entrance hall and the laboratories on the north side. There was also a door which communicated between the museum on its north side and the private rooms of the professor of anatomy. None of these doorways could be described as anything more than functional; there is no architectural statement being made in order to convey a sense of movement from a lesser space to one that is more important or significant. Equally the museum itself is simply a room that contained a reference collection which makes no attempt to impress. The room was lit from three huge square windows to the north (in keeping with the belief that north light was the best source of natural lighting) which overlooked the private yard through which cadavers were brought into the medical school from Westburn Lane. Two niches set into the south wall of the museum provide the only extraneous ornament. Wall cases were arranged around the wall to all four sides with carrels, punctuated by the niches, along the south

side.

CHEMISTRY MUSEUM, UNITED COLLEGE, UNIVERSITY OF ST. ANDREWS

Instruction in chemistry was not formally offered at the University of St. Andrews until the beginning of the nineteenth century, which was late in comparison to the other Scottish Universities. It became a compulsory subject in 1811 and the chair was established in 1840 (190).

In 1890 Walter Wood Robertson, an architect from H. M. Office of Works, designed a Chemical Laboratory for the university. The design was approved the same year and work started almost immediately (191). It was a one storey building erected to the east of Reid's east range.

Gillespie and Scott were asked to draw up sketch designs for an extension to Robertson's laboratory in 1902 (192). The additional buildings, to the north, provided room for classrooms, a lecture theatre and professors' rooms. There was also a small first floor museum measuring 22.6 x 14.0 ft. The final plans of 1903 show a few alterations to those of 1902 although the overall scheme was essentially the same (193). The chemistry museum remained in the same position on the first floor on the west side of the building but was slightly larger at 30.0 x 14.4 ft. (Fig. 88). A door from the landing of the staircase gave direct access to the space. One very wide and tall three-light window lit the museum.

The museum as built was faithful to this plan, although it has now been horizontally divided to provide two rooms with very low ceilings.

ZOOLOGY MUSEUM, UNIVERSITY COLLEGE, DUNDEE

University College, Dundee was founded in 1881 by a Deed of Endowment which established the college in theory, although it did not exist de facto until 1883. Set up by Miss Baxter of Balgavies in the spirit of Victorian philanthropy, it was intended to provide the city with a facility for the further education of its industrial masses, and to place Dundee firmly on the intellectual map of Scotland as a place of significance and importance that bred and possessed scholars and thinkers. Although it adopted the title university, the college was not in fact linked to a university until its union with the University of St. Andrews in 1890, when it became University College, Dundee.

In 1882 four detached Victorian villas on the Nethergate were purchased and modified to provide accommodation for the university (Fig. 89). These domestic properties were altered, extended and added to as the pupils, staff, subjects and possessions of the establishment increased. They provided the nucleus of the university campus until the 1960s when they were demolished in favour of 'the tower' and its associated buildings.

The first mention of a museum is in the 1885 - 1886 University Calendar, the same year in which Professor D'Arcy Wentworth Thompson joined the staff of the college:

Professor D'Arcy Thompson ... only entered upon his duties in the middle of the Winter Session; but has since been doing work in connection with his Laboratory and Museum such as will enable him to offer very special advantages to students

of his Science ... considerable progress has been made towards the creation of a Museum ... About 600 bottles of permanent specimens have been prepared by me, and some rare and valuable preparations would even now form a useful type collection, had I room and cases for their proper display.

(194)

The following year Thompson is recorded in the University Calendar expressing his enthusiasm at the growth of the museum whilst at the same time mentioning that " ... circumstances still oblige me to teach Zoology without a museum ..." (195). In the 1891 - 1892 Calendar he desperately notes that "We are at our wits end for room to store additional specimens." (196).

The first mention of the Council attempting to address the absence of a purpose-built museum space, and alleviate the very serious problem of overcrowding was in 1890:

We trust that the buildings themselves, with such additions as may be found possible, may continue to serve their purpose for many a long year to come, for no proposal to demolish them and to erect a new college could be carried out without the needless sacrifice of vast sums of money. But the ingenuity of our architect, Mr Murray Robertson, has produced a design which, for a moderate cost (not exceeding £5,000), seems to make the most that can be made of the situation, by grouping the buildings together on one continuous and harmonious front, and providing at the same time accommodation for the homeless department of Botany, and a Museum extension. (197)

It was not however, until 1892 that the Council resolved to

adopt Murray Robertson's plans for the extension of the Nethergate buildings. The alterations conducted by the architect did not take long and the natural history department moved into its new premises in 1894.

The museum was housed in a building which Robertson built in-between, and to the north of, the two eastern-most Victorian villas (198) (Fig. 90). All of the four original detached houses on the site were different in style (although the two to the east were obviously built at the same time and as a pair), and the architect continued this theme by designing a three-storey building that is quite distinct in style to the rest but which, to the south, resembled domestic housing. The north elevation was a far grander affair which ran the length of both the museum in full, the botany department to the east, and the villa that sat to the west. The architect was therefore given a longer elevation and greater scope to express something of the function of the building. The south front of the museum completely disguises the nature and distribution of the internal space.

The museum occupied the first and second floors of the structure built between the existing Victorian villas, and the second floor attics of Robertson's extension to the north (Fig. 91). There were three points of access to the principal floor of the museum; a corridor to the east which connected to botany on the ground floor, a door leading to an unnamed private space (possibly Thompson's office), and, to the west of the museum, a corridor with a well-stair that led to the ground floor of zoology. The first floor of the museum measured 38 x 32 ft. It was surrounded

by a mezzanine to all four sides which was 4 ft wide to the east and west, and 5.5 ft wide to the north and south. This was supported on large decorative cast iron cantilever brackets where the mezzanine was narrowest, undecorated iron girders to the south, and with the aid of slim iron supports at the north end. The retaining wall to the north had been removed and led into the north extension at attic level. The museum occupied all of the space beneath the roof of the north wing which was continuous with the mezzanine except for the bird room to the west. The bird room was accessed from the mezzanine and from a half-turn spiral stair to the south.

The museum was lit from three windows to the south on the first floor, by two dormers on the second floor (also to the south), and from a cupola above the central well. Although the plans do not detail it, a letter from the architects Mills and Shepherd in c.1895, makes mention of a cupola in conjunction with the mansard roof (199). The bird room was lit from two narrow banks of skylights in the north and south pitch of the north wing.

This museum is interesting for a number of reasons: firstly because it was so large for such a humble establishment. Its size, relative to the rest of the university's property as a whole, is a telling indication of the importance of the role it played in education at the university during the nineteenth century. In addition to this the architect's decision to mimic the domestic interior of its neighbouring, converted buildings is curious. Sketches of the south elevation in 1892 prior to Roberston's addition show a major remodelling which would have provided the sort of continuous facade indicative of an

educational establishment. However in both the sketches (that project the appearance of the exterior) and in its realisation, the building that sat between the two existing villas was deliberately at odds with its context in terms of fenestration and elevation. That this was the case is no doubt due to a lack of funds, yet in both the projected sketches and final result quite extensive changes were made to the south front which were clearly, and deliberately, at variance with the museum. The archives give no clear indication as to why the architect chose to make the museum distinct, and at the same time disguise it as a domestic building.

Dundee University Calendars from the 1880s and 1890s make mention of a number of other museums being established concurrently with that of the zoology department. In the Calendar of the sixth session mention is made of a technical museum attached to the Chemical, Dyeing, and Bleaching Department, and Calendars of the seventh, eighth, tenth and twelfth sessions mention the museum of the department of botany (200). The Calendar of the twenty-second session indicates that by 1904/5 the geology department also had a museum (201). Exactly what form the technical and geology museums took is difficult to ascertain. No documentation has been found to indicate the arrangement of these spaces. The botany museum was set up under Patrick Geddes and occupied rooms in the villa to the east of the zoology department. This was converted to suit the needs of the department by Murray Robertson concurrent with the redesigning of the department of zoology. Geddes took possession of his new accommodation and its museum during 1894. It was placed on the

ground floor and was lit from three windows to the south.

ANATOMY MUSEUM, MEDICAL SCHOOL, UNIVERSITY COLLEGE, DUNDEE

The history of education in medicine in Dundee is complicated, and involved a great deal of bickering between University College, Dundee, and the University of St. Andrews. Affiliation between the two institutions was a tortuous process with each establishment bargaining over possession of clinical and pre-clinical teaching. Instruction in the latter began in the 1887/1888 session, although it was not until 1890 that an agreement between the two universities as to the distribution of taught subjects and students was reached. Dundee and St. Andrews suffered a temporary split following this union, during which time students studying at Dundee graduated through either Edinburgh, Glasgow or London. Re-affiliation of the two occurred in 1897 and a conjoint medical school started in earnest with the establishment of the Faculty of Medicine. From this point all clinical years were taught at the Dundee Royal Infirmary, and anatomy and physiology were taught at the Medical School, Dundee (202).

During the course of the 1890s the University Commissioners had been discussing the necessity of erecting a building in which to teach medicine. The fact that the college was destitute of funds was a serious obstacle to instituting this plan. There was also a great deal of uncertainty about the future of the conjoint Medical School because of the inability of St. Andrews and Dundee to agree on the form it would take.

In 1902 Robert Rowand Anderson was appointed architect to design a number of different buildings for the University (203). He

superseded the Dundee architects Murray Robertson and John Findlay who had already designed a Medical School, which it was estimated would cost £20,000. Robertson's designs were lodged with the Police Commission by September 1901 so it is clear that his scheme pre-dates Anderson's appointment (204). An appeal to raise funds was started in 1902. The University of St. Andrews provided £14,000 and the rest was donated from a number of other sources including bequests from Sir William Ogilvey Dalgleish and the Carnegie Trust.

Building started in 1902 under Murray Robertson's successor, James Findlay, and the School was completed by 1904/5. It stood to the north of the converted Victorian villas that formed the earliest University buildings. Robertson's plans are true to the finished product and show a four-storey Scots Baronial edifice with its principal elevation to the south. Each corner boasted corbelled, ogee-topped projecting stair turrets from the second to the third floors. These were purely cosmetic conceits and did not function as staircases. Above the central pavilion was a curvilinear pediment, and a small ogee-shaped cupola atop the steeply pitched roof echoed the stair turret roofs. It was a building of enormously tall and solid elevations which then would have completely dwarfed everything in its vicinity.

The anatomy museum was situated in the centre pavilion of the north side of the building on the second and third floors. It was 32 x 26 ft. with a gallery around all four sides. The light well was 15 x 12 ft. A door in the north corridor led on to the principal floor of the museum. There was no internal staircase

between the principal floor of the museum and the mezzanine.

Access to the museum gallery was through a door from the corridor on the third floor. Two doors to the east and west led to a private laboratory and dissecting room.

Windows above and below the mezzanine admitted north light, and there was no top lighting. Robertson's plans give no indication as to the intended arrangement of cases. It must be assumed that on the mezzanine specimens were displayed in continuous wall cases in between the windows because its width would have prohibited free-standing furniture or a carrel arrangement of cases.

Robertson's plans indicate that there was a second smaller, 'class' museum on the first floor. It was situated on the first floor directly beneath the anatomy museum. This space was possibly used to display specimens used for the teaching of *materia medica* since it was in close proximity to classrooms and laboratories given over to this department.

CONCLUSION

Throughout the period 1789 - 1930 Scottish universities were pre-eminent in their provision for museum collections. During the early part of the nineteenth century, when collecting was firmly established as a European preoccupation, there were very few public museums in Scotland and England. Those that did exist were established and funded by educational institutions.

Universities played a central role in the provision of publicly accessible museums, and it is significant that the first public museum in Scotland, William Stark's Old Hunterian (1804), was a university museum.

The state showed itself reticent in providing a mechanism for funding collecting and the erection of museums. The universities, however, established museums in large numbers throughout the early nineteenth century. Although there was rarely an active policy of acquisition, universities needed collections in order to fulfil their central role as centres of education and research. When universities did find themselves in possession of collections they made it a priority to provide suitable, purpose-built accommodation in which to store and display them. Within all of the new college schemes of the educational establishments of Aberdeen, Dundee, Edinburgh, Glasgow and St. Andrews there were significant rooms allocated for displaying teaching and research collections.

Common to all of the large, public university museums is the very privileged status they enjoyed. Vast sums of money were allocated for the design of large museum halls with extremely

lavish interiors. Some of Scotland's finest architects were commissioned to design these museum spaces, and as a consequence they are an architecturally outstanding group. Furthermore, as a building type they are distinctive in design. The museum hall, rising through two floors, with a mezzanine and top-lighting is a recurring theme. Established as an accepted standard for university museums in both Scotland and England, it was copied by the architects of public and municipal museums.

The Old Hunterian, Glasgow is a particularly important building. It was the first construction of its kind in Britain, and although never repeated by the architects of this group of museums, it did set a precedent for the architecture of public galleries. The reason for the non-continuation of the classical temple-type is due to the fact that it was a design which was more appropriate for the display of fine art. The 'palace of art' (205) concept of museum architecture was not relevant in the Scottish university context where the emphasis was on provision for natural history and medical collections. It must also be remembered that, with the exception of the Old Hunterian, university museums were never free-standing, but always conceived as sub-units of larger college schemes.

The evidence presented here highlights several important issues for consideration. Firstly, as museum collections have ceased to play a part in university education the rooms that were designed to house them have been re-designated.

The decline in the status of the hand-held museum object and the shift away from pedagogic teaching methods did not have an immediate detrimental effect on the status of museums of

educational institutions. Many of the museums covered here were built after the collections they housed ceased to have any useful purpose in teaching. The second, late nineteenth and early twentieth century, group of university museums could never have been truly useful in the teaching of the subjects that they illustrated. The enormous Anatomy Museum of the University of Edinburgh Medical School is a testament to this. Built after anatomy had been superceeded by other 'micro' medical subjects, it is hard to understand why it should have been thought necessary to include it in the School at all.

The pattern of the establishment of university museums would tend to suggest that the inclusion of a museum space, in any new departmental or college building, was a matter of habit. The tradition of setting aside a room for various departmental collections was so well-established that to omit it would have been inconceivable.

The inevitable neglect and de-accessioning of collections, and the subsequent reallocation of museum spaces for other uses, occurred much later on in the mid twentieth century.

The much larger principal museums of the universities of Aberdeen, Edinburgh, Glasgow and St. Andrews have survived. Due in part to their role as a college ornament and advertisement, but also because they were (and continue to be) a public resource.

The widespread neglect and underfunding of these collections is a characteristic feature of the history of Scottish universities throughout the latter half of the twentieth century. The sense of crisis surrounding university museums formed the subject of a recent HMSO report into the current status of university

collections (206). This report deals only with university collections and not with the spaces designed to accommodate them. The neglect and unwitting destruction of university museums is a cause for concern, and is linked to the current careless attitude towards the collections themselves. University museums have suffered irreparable damage on account of successive periods of rationalisation of space. Many of the museums, like the Old Hunterian, Glasgow, or the Andersonian, Glasgow, no longer exist. Other museum spaces covered here have been altered so radically that they bear little resemblance to their original appearance, and are beyond restoration.

In the past there has been a remarkably perfunctory attitude towards the importance of preserving relevant archival material, relating to this significant contribution to the architectural heritage of Scotland (207). Valuable plans, correspondence, and photographs which document the erection of some of the smaller museum spaces are in danger of being lost or damaged because there is no system in place for organising a proper archive.

APPENDIX 1

List of Architects involved in the design of Scottish University Museums

Key to date symbols

(s) = started

(p) = date of plans

(c) = completed

ADAM, Robert

1728 - 1792

Anatomy Museum, University of Edinburgh

1789 (p) (completed by Playfair)

Natural History Museum, University of Edinburgh

1789 (p) (unexecuted)

ANDERSON, Robert Rowand

1834 - 1921

(a) Anatomy Museum, Medical School, University of Edinburgh

1878 (s), 1880 (c, first part), 1890 (c, second part)

(b) Fine Art Museum, University of Edinburgh

1887 (c)

(c) Anatomy Museum, Medical School, University College, Dundee

(plans by James Findlay and John Murray Robertson)

1901 (p), 1902 (s)

(d) New Barclay Museum, Royal College of Surgeons, Edinburgh

(with Arthur Forman Balfour Paul)

1908 (p)

BAIRD, John, I

1798 - 1859

Hunterian Museum, University of Glasgow, Woodlands

(i) 1846 (p) (design 1, unexecuted), (ii) c. 1847 (p) (design 2, unexecuted), (iii) 1847 (p) (design 3, unexecuted)

BLORE, Edward

1787 - 1879

Hunterian Museum, University of Glasgow, Woodlands

1849 (p) (unexecuted)

BURNET, John James

1857 - 1938

(a) Anatomy Museum, University of Glasgow

(with John Oldrid Scott)

1900 (p)

(b) Herbarium and Botany Museum, University of Glasgow

(with John Oldrid Scott)

1911 (p)

(c) Zoology Museum, Graham Kerr Building, University of Glasgow

1921 (p) and 1923 (p)

COUSIN, David

1808 - 1878

(a) Museum of the Reid School of Music, University of Edinburgh

c.1858 (p), 1959/60 (c)

(b) Phrenology Museum, Phrenological Society, Edinburgh

1874 (p)

CRAIG, John

? - c.1815

The Grammar School, George Street, Glasgow

1887 - 1888 (c)

DICKSON, Richard and Robert

1792 - 1857 and c.1794 - 1865

Museum of the Royal College of Veterinary Surgeons, Clyde Street,
Edinburgh

1833 (c)

FINDLAY, James

? - 1943

See John Murray Robertson

GILLESPIE, James

1854 - 1914

(a) Anatomy Museum, Bute Medical School, University of St.

Andrews

(with James Scott)

1899 (c)

(b) Chemistry Museum, United College, University of St. Andrews

1903 (p)

(with James Scott)

(c) Bell Pettigrew Museum, University of St. Andrews

(with James Scott)

1908 (p), 1909 (p)

LORIMER, Sir Robert

1864 - 1929

(a) Zoology Museum, Ashworth Building, University of Edinburgh

(with John Fraser Matthew)

1927 (s)

(b) The Cockburn Museum, Grant Institute, University of Edinburgh

(with John Fraser Matthew)

1929 (p)

(c) Museum of the Department of Research in Animal Genetics,

University of Edinburgh

(with John Fraser Matthew)

1930 (c)

MACKENZIE, Alexander Marshall

1848 - 1933

Class Museums, Marischal College, Aberdeen

1891 (s)

MCARTHY, David

c. 1854 - 1926

General Museum, Royal (Dick) Veterinary College, Summerhall,
Edinburgh

1913 (p)

MATTHEW, John Fraser

1875 - 1955

See Robert Lorimer

NIXON, William

c. 1810 - 1848

Natural History Museum, United College, University of St. Andrews
(with Robert Reid)

1849 (c)

PAUL, Arthur Forman Balfour

1875 - 1938

See Robert Rowand Anderson

PLAYFAIR, William Henry

1790 - 1857

(a) Natural History Museum, University of Edinburgh

1816 (p)

(b) Pathological and Anatomical, and Barclay Museums, Royal
College of Surgeons, Edinburgh

1829 (p), 1832 (c)

REID, Robert

1775 - 1856

See William Nixon

Natural History Museum, University of Edinburgh

c. 1810 (p) (competition plans - unexecuted)

ROBERTSON, John Murray

1844 - 1901

(a) Zoology Museum, Medical School, University College, Dundee

1892 (p)

(b) Anatomy Museum, Medical School, University College, Dundee
(with James Findlay)

c.1901 (p)

SCOTT, George Gilbert

1810 - 1878

Hunterian Museum, University of Glasgow

(with John Oldrid Scott - completed college scheme after 1878)

1866 (s)

SCOTT, John Oldrid

1841 - 1913

See George Gilbert Scott and John James Burnet

SCOTT, James

1861 - 1944

See James Gillespie

SCOTT, Robert

? - 1839

Museum of Anderson's University, St. George's Street, Glasgow

(with James Watt)

1830 (s)

SIMPSON, Archibald

1790 - 1847

Marischal Museum, Marischal College, University of Aberdeen

1834 (p), 1836 (s)

SMITH, John

1781 - 1852

Archaeological Museum, King's College, University of Aberdeen

1822 (s)

STARK, William

1770 - 1813

Old Hunterian Museum, University of Glasgow

1803 (p)

WATT, James

? - 1832

See Robert Scott

APPENDIX 2

A list of Scottish University Museums covered in this work.
Listed by location.

Key to date symbols

(s) = started
(p) = date of plans
(c) = completed

Aberdeen

1. Archaeological Museum, King's College, University of Aberdeen
1822 (s)
2. Marischal Museum, Marischal College, University of Aberdeen
1834 (p) (Simpson), and 1891 (s) (Mackenzie)

Dundee

3. Zoology Museum, University College
1892 (p)
4. Anatomy Museum, Medical School, University College
1901 (p)

Edinburgh

5. Anatomy Museum, University of Edinburgh
1789 (p)
6. Natural History Museum, University of Edinburgh
1816 (P)
7. Pathological, Anatomical and Barclay Museums, Royal College of Surgeons
1829 (s)
8. Museum of the Royal College of Veterinary Surgeons, Clyde Street
1833 (c)
9. Phrenology Museum, Phrenological Society, 1 Surgeons Square
c.1850 (c)
10. Museum of the Reid School of Music, University of Edinburgh
1858 (p)

11. Phrenology Museum, Henderson's Trust, Chambers Street
1874 (p)
12. Anatomy Museum, University of Edinburgh Medical School
1878 (p)
13. The Skullderry, University of Edinburgh Medical School
1878 (s)
14. Fine Art Museum, University of Edinburgh
1887 (c)
15. New Barclay Museum, Royal College of Surgeons
1908 (p)
16. General Museum, Royal (Dick) Veterinary College, Summerhall
1913 (p)
17. Zoology Museum, Ashworth Building, University of Edinburgh
1927 (s)
18. The Cockburn Museum, Grant Institute, University of
Edinburgh
1929 (p)
19. Museum of the Department of Research in Animal Genetics,
University of Edinburgh
1930 (c)

Glasgow

20. Old Hunterian Museum, University of Glasgow
1803 (p)
21. Museum of Anderson's University
1830 (s)
22. The Hunterian Museum, University of Glasgow
1866 (s)
23. Robertson Museum and Aquarium, Marine Biological Satation,
Millport, Isle of Cumbrae
c. 1887
24. Anatomy Museum, University of Glasgow
1900 (p)
25. Herbarium and Botany Museum, University of Glasgow
1911 (p)
26. Zoology Museum, Graham Kerr Building, University of Glasgow
1921 (p)

St. Andrews

27. Natural History Museum, University of St. Andrews
1849 (c)
28. Anatomy Museum, Bute Medical School, University of St.
Andrews
1899 (c)
29. Chemistry Museum, United College, University of St. Andrews
1903 (p)
30. Bell Pettigrew Museum, University of St. Andrews
1908 (p), 1909 (p)

APPENDIX 3

A list of Scottish University Museums in date order.

Key to date symbols

(s) = started

(p) = date of plans

(c) = completed

- 1789 (p) Anatomy Museum, University of Edinburgh
 Robert Adam (1728 - 1792) (completed by Playfair)
- 1789 (p) Natural History Museum, University of Edinburgh
 Robert Adam (1728 - 1792) (unexecuted)
- 1804 (p) Old Hunterian Museum, University of Glasgow
 William Stark (1770 - 1813)
- 1816 (P) Natural History Museum, University of Edinburgh
 William Henry Playfair (1790 - 1857)
- 1822 (s) Archaeological Museum, King's College, University of Aberdeen
 John Smith (1781 - 1852)
- 1829 (s) Pathological and Anatomical, and Barclay Museums, Royal College of Surgeons, Edinburgh
 William Henry Playfair (1790 - 1857)
- 1830 (s) Museum of Anderson's University, St. George's Street, Glasgow
 Robert Scott (? - 1839)
 James Watt (? - 1832)
- 1833 (c) Museum of the Royal College of Veterinary Surgeons, Clyde Street, Edinburgh
 Richard Dickson (1792 - 1857)
 Robert Dickson (c.1794 - 1865)

- 1834 (p) Marischal Museum, Marischal College, University of Aberdeen
Archibald Simpson (1790 - 1847)
- 1845 (p) Hunterian Museum, University of Glasgow
- 1846 (p) John Baird I (1798 - 1859) (plans 1845/6/7)
- 1847 (p) Edmund Blore (1787 - 1879) (plans 1849)
- 1849 (p) (all unexecuted)
- 1849 (c) Natural History Museum, United College, University of St. Andrews
William Nixon (c.1810 - 1848)
Robert Reid (1774 - 1856)
- 1850 (c) Phrenology Museum, Phrenological Society, 1 Surgeon's Square, Edinburgh
Architect unknown
- 1858 (p) Museum of the Reid School of Music, University of Edinburgh
David Cousin (1808 - 1878)
- 1866 (s) Hunterian Museum, University of Glasgow
George Gilbert Scott (1810 - 1878)
John Oldrid Scott (1841 - 1913)
- 1874 (p) Phrenology Museum, Phrenological Society, Chambers Street, Edinburgh
David Cousin (1808 - 1878)
- 1878 (s) Anatomy Museum, Medical School, University of Edinburgh
Robert Rowand Anderson (1834 - 1921)
- 1887 (c) Fine Art Museum, University of Edinburgh
Robert Rowand Anderson (1834 - 1921)

- 1891 (s) Class Museums, Marischal College, University of Aberdeen
Alexander Marshall Mackenzie (1848 - 1933)
- 1892 (p) Zoology Museum, University College, Dundee
John Murray Robertson (1844 - 1901)
- 1896 (s) Robertson Museum, University Marine Biological Station, Millport Haven, Isle of Cumbrae
Architect unknown
- 1899 (c) Anatomy Museum, Bute Medical School, University of St. Andrews
James Gillespie (1854 - 1914)
James Scott (1861 - 1944)
- 1900 (p) Anatomy Museum, University of Glasgow
John James Burnet (1857 - 1938)
John Oldrid Scott (1841 - 1913)
- 1901 (p) Anatomy Museum, Medical School, University College, Dundee
James Findlay (? - 1943)
John Murray Robertson (1844 - 1901)
[Building of the Medical School overseen by Robert Rowand Anderson (1834 - 1921)]
- 1903 (p) Chemistry Museum, United College, University of St. Andrews
James Gillespie (1854 - 1914)
James Scott (1861 - 1944)
- 1908 (p) New Barclay Museum, Royal College of Surgeons, Edinburgh
Robert Rowand Anderson (1834 - 1921)
Arthur Forman Balfour Paul (1875 - 1938)

- 1908 (p) Bell Pettigrew Museum, University of St. Andrews
- 1909 (p) James Gillespie (1854 - 1914)
James Scott (1861 - 1944)
- 1911 (p) Herbarium and Botany Museum, University of Glasgow
John James Burnet (1857 - 1938)
John Oldrid Scott (1841 - 1913)
- 1913 (p) General Museum, Royal (Dick) Veterinary College,
Summerhall, Edinburgh
David McCarthy (c.1854 - 1926)
- 1921 (p) Zoology Museum, Graham Kerr Building, University of
Glasgow
John James Burnet (1857 - 1938)
- 1927 (s) Zoology Museum, Ashworth Building, University of
Edinburgh
Sir Robert Lorimer (1864 - 1929)
John Fraser Matthew (1875 - 1955)
- 1929 (p) The Cockburn Museum, Grant Institute, University of
Edinburgh
Sir Robert Lorimer (1864 - 1929)
John Fraser Matthew (1875 - 1955)
- 1930 (c) Museum of the Department of Research in Animal
Genetics, University of Edinburgh
Sir Robert Lorimer (1864 - 1929)
John Fraser Matthew (1875 - 1955)

APPENDIX 5

Significant English university museums in date order.

Key to date symbols

(p) = date of plans

(s) = started

(c) = completed

1683 (c) The Old Ashmolean, Oxford University
T. Wood (1643 - 1695)

1806 (s) Museum of the Royal College of Surgeons, London
G. Dance (1741 - 1825)

1825 Anatomy Museum, Guy's Hospital, St. Thomas Street,
London
(architect unknown)

1826 (p) Museum of Zoology and Comparative Anatomy, University
1828 (p) College, London
W. Wilkins (1778 - 1839)

1837 (s) Fitzwilliam Museum, Cambridge University
G. Basevi (1794 - 1845)
C. R. Cockerell (1788 - 1863)

1845 (c) Ashmolean Museum, Oxford University
C. R. Cockerell (1788 - 1863)

1860 (c) University Museum of Natural History, Oxford University
T. Deane (1792 - 1871)
B. Woodward (1816 - 1861)

1865 (c) Museum of and Zoology, Cambridge University
A. Salvin (1799 - 1881)

1865 (c) Herbarium, Cambridge University
A. Salvin (1799 - 1881)

1869 (s) Owen's College Museum, Manchester
A. Waterhouse (1830 - 1905)

c.1873 Sedgwick Museum, Cambridge University
T. G. Jackson (1835 - 1924)

1884 (c) Museum of Archaeology and Ethnology, Cambridge
University
B. Champneys (1842 - 1935)

1904 (c) Humphrey Museum, Medical School, Cambridge University
E. S. Prior (1852 - 1932)

1904 (c) Herbarium and Botany Museum, Cambridge University
W. C. Marshall (? - ?)

1905 (c) Museum of Guy's Hospital Medical School, St. Thomas
Street, London
J. H. T. Wood (? - ?)
W. J. Walford (? - ?)

1909 (p) New Museum of Archaeology and Ethnology, Cambridge
University
T. G. Jackson (1835 - 1924)

NOTES

1. There are also a large number of unnamed museum spaces which are not mentioned anywhere in the text. See for example the Plans for the Medical School, University College, Dundee and New College, Glasgow.
2. Markus, T. A. 'Domes of Enlightenment: Two Scottish University Museums', Art History, Vol. 8, No. 2, June 1985, pp. 158 - 177
3. Fraser, A. G. The Building of Old College, Edinburgh, 1989
4. Murray, D. Museums. Their History and Their Uses, Glasgow, 1904, pp. 1 - 19
5. Drysdale, L. A World of Learning: University Collections in Scotland, Edinburgh, 1990, pg. 23
6. Ibid., pg. 25
7. Laura Drysdale does not have a 'general' category in her survey of collection types. It has been included here as an addition for the sake of convenience.
8. Knox, F. J. The Anatomist's Instructor and Museum Companion, Edinburgh, 1836, Pg. 5

9. Girdwood, R. 'The Edinburgh Medical School, past and present', University of Edinburgh Bulletin, Edinburgh, 1983, Vol. 19, No. 5, pg. 10
10. Adam's executed 1789 design for the Anatomy Museum is earlier than Stark's Hunterian. However, it was not fitted out until much later under Playfair.
11. Eastlake, R. 'A letter to Sir Robert Peel concerning Wilkins' National Gallery, London', The Builder III, 14 June 1845, Pg. 282
12. Museum Records of the Hunterian Museum, 1808 - 1870, MR 27 - 34
13. Redgrave, R. 'Construction of Picture Galleries', The Builder XV, 28 November 1857, pg. 689
14. Brawne, M. The Museum Interior, London, 1982, pg. 9
15. Waterston, C. Collections in Context, Edinburgh, 1997, pp. 111 - 114
16. Ibid., pp. 112 - 122
17. Ibid., pp. 1 - 10

18. Lewis, G. 'Collections, collectors, and museum in Britain to 1920' in Thomson, J. M. A. (ed), Manual of Curatorship, London, 1984, Chapt. 3., pp. 29 - 30
19. Knox, Op. Cit., pg. vii
20. Anon. 'Address by Professor Flemming at the opening of The Royal Physical Society', The Witness, vol. X, No. 1059, 21 November, 1849, pg. 2
21. Ramsay, J. Aberdeen Journal, Aberdeen, 6 April, 1836
22. Fraser, Op. Cit., pg. 90
23. Ibid., pg. 90
24. Murray, D. The Hunterian Museum in the Old College of Glasgow, Glasgow, 1925, pg. 4
25. Archibald Simpson's great hall was converted into a picture gallery by Marshall Mackenzie in 1891.
26. Bullock, J. M. A History of the University of Aberdeen, London, 1895, pg. 159
27. Ibid., pg. 200

28. For a full account of the architecture of King's and Marischal see Walker, D. 'The Rebuilding of King's and Marischal Colleges, 1723 - 1889', The Aberdeen University Review, Vol. LV, 2, No. 190, 1993, pp. 123 - 143
29. Block plans of King's College, Aberdeen in *Portfolio of historical documents an plans relating to King's College and Marischal College, Aberdeen*, Lff Aa P105 View
30. Anon. Views of King's College, Old Aberdeen 1660 - 1860, (unpublished), pg. 4
31. Anderson, P. J. (ed) Selections from the Records of Marischal College, Old Aberdeen 1660 - 1860, Vol. I, Aberdeen, 1889, pg. 504
32. Ibid., pg. 504
33. Walker, Op. Cit., pg. 137 - 138
34. Letter from Prof. David Walker to Sarah Blomfield, March 1999. Prof. David Walker pointed out the similarity between the architect's remit for the 1825 competition, and Wilkins' University College, London.
35. Simpson, A. *Plans for Marischal College, Aberdeen*, 1834
36. Anderson, Op. Cit., pg. 507

37. Walker, Op. Cit., pg. 138
38. Fraser, G. M. 'Archibald Simpson: architect and his times', Aberdeen Weekly Journal, 27 September, 1918 (unpublished)
39. The definitive book on the history and building of Edinburgh University New College is Fraser, A. The Building of Old College, Edinburgh, 1989
40. Ibid., pg. 34
41. Ibid., pg. 89
42. Ibid., pg. 90
43. Ibid., pg. 90
44. Letter from Prof. David Walker to Sarah Blomfield, March 1999. Prof. David Walker pointed out the relationship between the Principal and the architect.
45. Fraser, Op. Cit., pp. 138 - 139
46. Photograph of the Great Gallery in Anon. Mellerstain, Derby, 1994, pg. 11
Dr. Charles Waterston is responsible for identifying the Mellerstain cases as those designed by Playfair for the Natural History Museum, University of Edinburgh.

47. Gifford, J. & McWilliam, C. & Walker, D. & Wilson, C.
Buildings of Scotland: Edinburgh, London, 1984
48. Fraser, Op. Cit., pp. 41 - 43
49. Anon. Leidse Universiteit, Amsterdam, 1975, (translated by Mateusz Fahrenholz), pp. 100 - 110
50. Fraser, Op. Cit., pp. 288 - 289
51. Marischal College had a picture gallery, but this was not purpose-built. Marshall Mackenzie adapted the great hall in 1891.
52. Anon. The New Department of Zoology, (unpublished), pg. 2
53. Ibid., pg. 2
54. Gen. 1963/23.291, Lorimer Archive, University of Edinburgh Library Special Collections, Edinburgh
The final cost of the Zoology Department was £80,000. The University therefore made a profit of £32,000
55. Lorimer, R. & Matthew, J. F. *Plans for the Zoology Department, King's Buildings, University of Edinburgh*, 1927,
and *Sketch Plan of the Ground Floor of the Zoology Department, King's Buildings, University of Edinburgh*,
(undated and unsigned)

56. Gen. 1963/23.291, Lorimer Archive, University of Edinburgh
Library Special Collections, Edinburgh
57. Anon. The Times, 15 May 1929
58. Anon. Grant Institute of Geology, c. 1929, pg. 3
59. Lorimer, R. and Matthew, J. F. *Plans for the Geology Department, King's Buildings, University of Edinburgh*, 15 October 1929, and *Plans for the Geology Department, King's Buildings, University of Edinburgh*, 20 June 1929, (revised and amended)
60. Anon. The Scotsman, 30 June 1930 and 11 July 1930
61. Gen. 1963/26.315 a - e, Lorimer Archive, University of Edinburgh Library Special Collections, Edinburgh
62. The plans for this museum have not been located. They are not held at University of Edinburgh Library Special Collections, University of Edinburgh Estates and Buildings, Edinburgh City Archives, or Royal Commission of Ancient and Historical Monuments of Scotland.
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64. Stevenson, A. The Building of the Royal College of Surgeons, extracted from the Records, 1827 - 1833, (unpublished), pg. 2
65. Tansey & Mekie, Op. Cit., pg. 13
66. Stevenson, Op. Cit., pg. 2
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68. Stevenson, Op. Cit., pg. 5
69. Ibid., pg. 6
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71. Ibid., pg. 157
72. Ibid., pg. 340
73. Tansey & Mekie, Op. Cit., pg. 29
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75. Ibid., pg. 29

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79. Ibid., pg. 9
80. Field, C. D. S. 'John Donaldson and the teaching of acoustics at the University of Edinburgh in the mid-Nineteenth Century', Proceedings of the Institute of Acoustics, Vol. XIX/5, 1997, pp. 510 - 514
81. Letter from Prof. Christopher D. S. Field to Sarah Blomfield, 30 April 1998
82. Plans for this building have not been traced. An extensive search was made in 1997 by Prof. Christopher Field (Department of Music, University of Edinburgh), Dr. Arnold Myers (Curator, Reid School of Music), and Fiona McLachlan (Department of Architecture, University of Edinburgh). I conducted a further search in 1998 at the University of Edinburgh Library Special Collections, University of

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83. Pers. Comm., Arnold Myers, Curator, Reid School of Music

84. Bradley, O. C. History of the Edinburgh Veterinary College, Edinburgh, 1923, pg. 6

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100. Ibid., pg. 17

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159. Collins Gallery, Strathclyde University Archives, Glasgow
160. Strathclyde University Archives, Glasgow, SUA OB/10/1/3
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162. Strathclyde University Archives, Glasgow, SUA P2/1/15,16,17
163. Strathclyde University Archives, Glasgow, SUA OB/10/1/3
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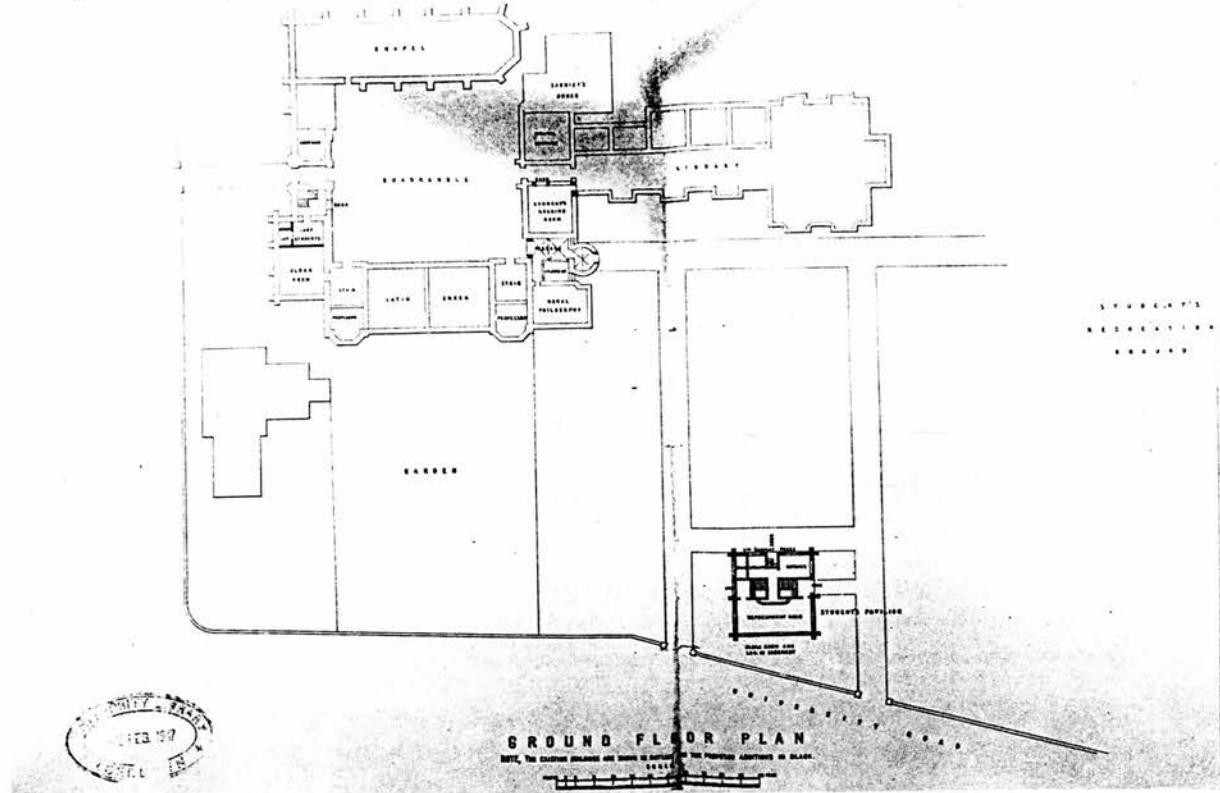


Fig. 1

King's College, University of Aberdeen

John Smith c.1822

Ground floor plan by Matheson showing Smith's original buildings and the college as extended by Matheson.

ABERDEEN UNIVE
EXTENSION OF KING'S
BUILDINGS.

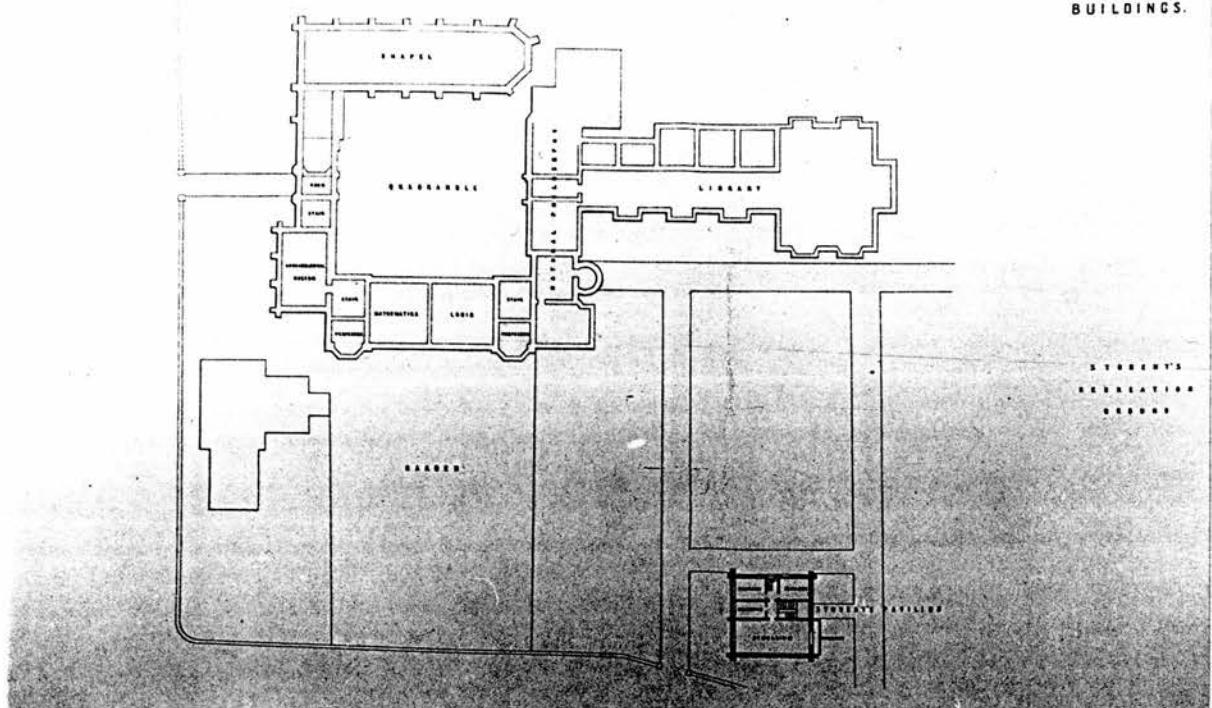


Fig. 2

King's College, University of Aberdeen

John Smith c.1822

First floor plan by Matheson showing Smith's original buildings and the college as extended by Matheson.

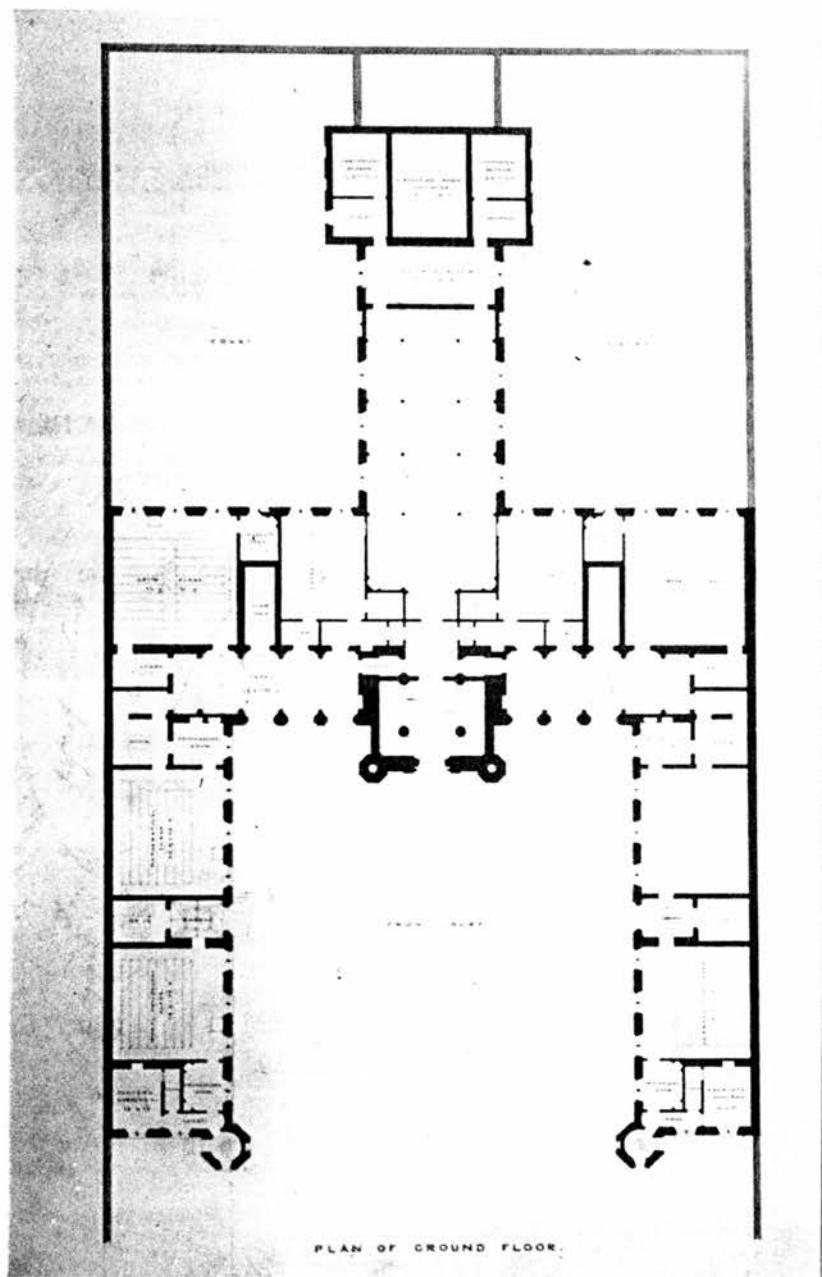


Fig. 3

Marischal College, University of Aberdeen

Archibald Simpson 1834

Ground floor plan.

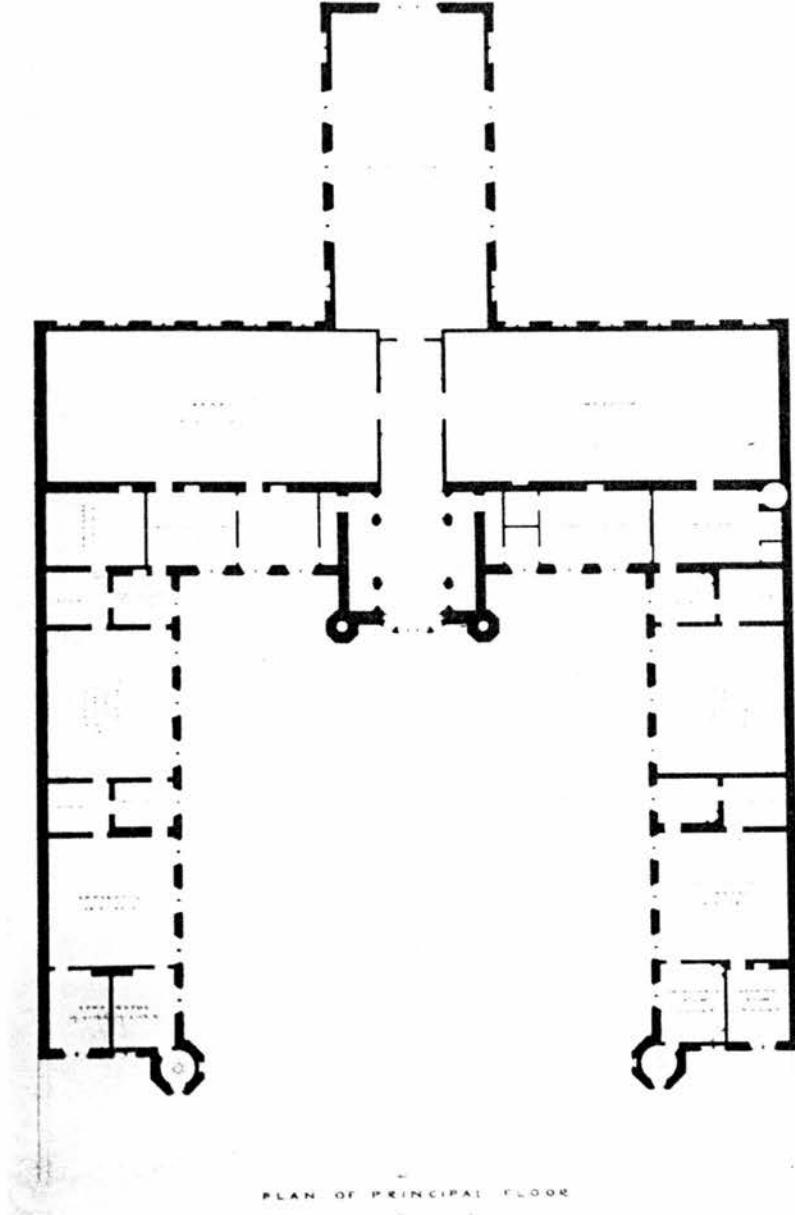
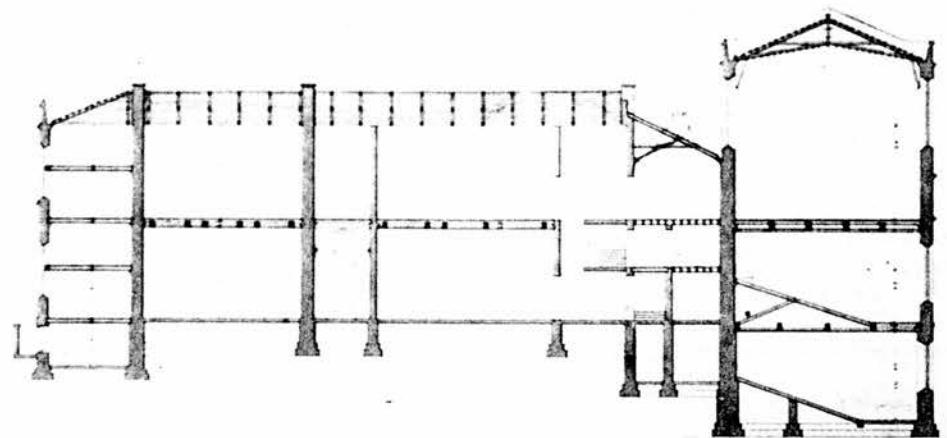


Fig. 4

Marischal College, University of Aberdeen

Archibald Simpson 1834

First floor plan.



SECTION ON LINE A.B.

0 10 20 30 40 50 60 70 80 90 100 feet.

A. W. Simpson
Architect
Marischal College

Fig. 5
Marischal College, University of Aberdeen
Archibald Simpson 1834
Longitudinal section (west east).

PLAN V

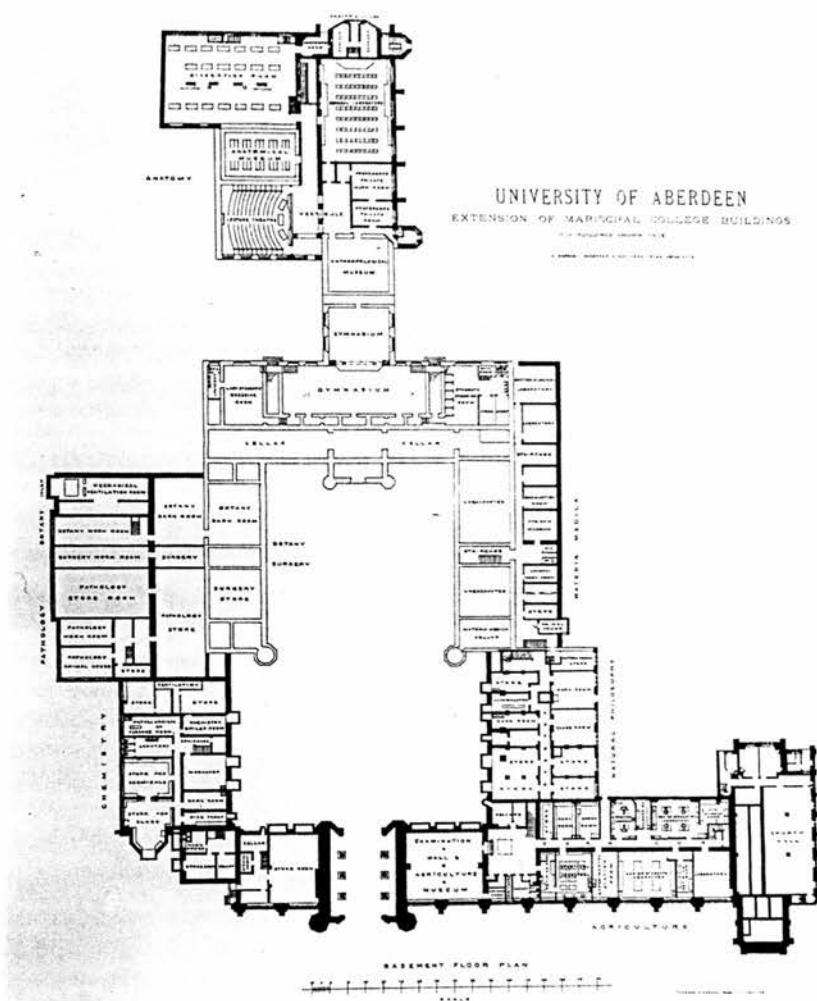


Fig. 6

Marischal College, University of Aberdeen

Archibald Simpson 1834

Marshall Mackenzie 1891 (shown in bold)

Block plan of basement.

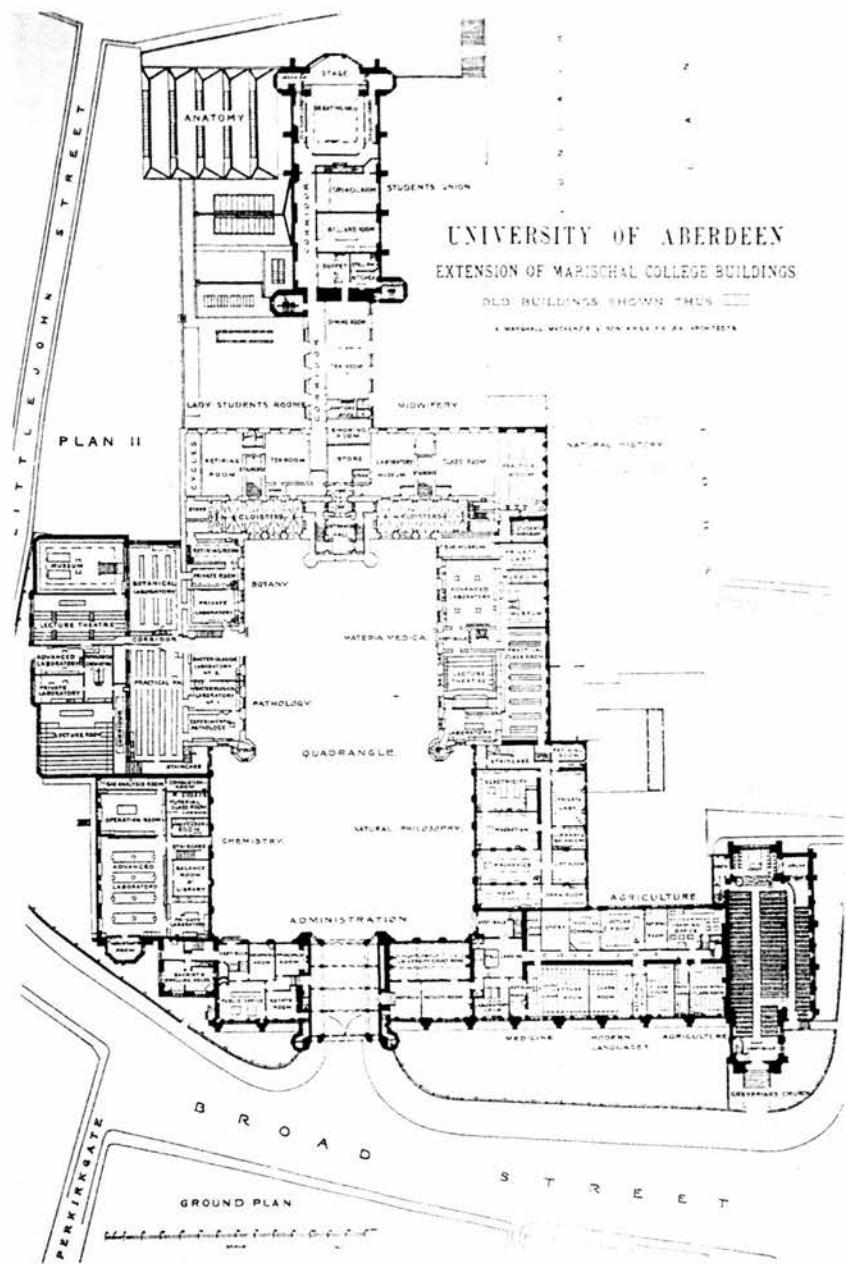


Fig. 7

Marischal College, University of Aberdeen

Archibald Simpson 1834

Marshall Mackenzie 1891 (shown in bold)

Block plan of ground floor.

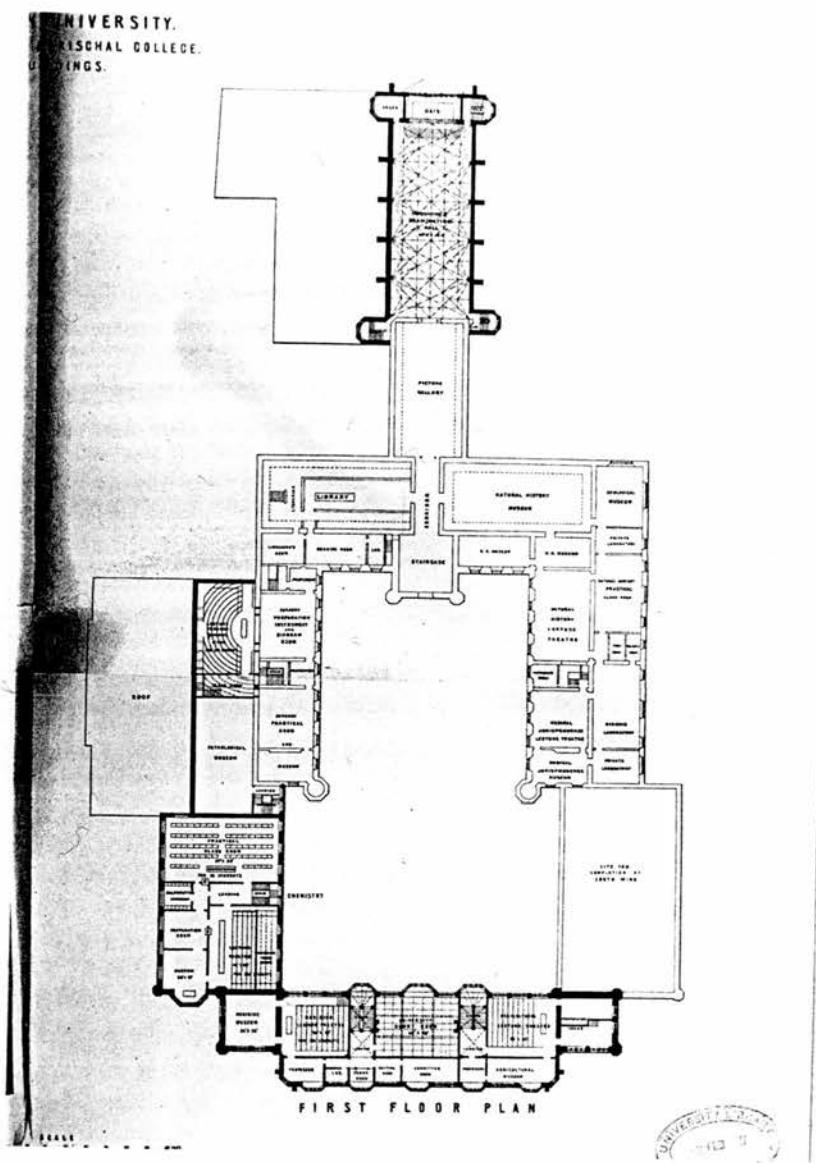


Fig. 8

Marischal College, University of Aberdeen

Archibald Simpson 1834

Marshall Mackenzie 1891 (shown in bold)

Block plan of first floor.

THE ADAM COLLEGE, 1789-1804

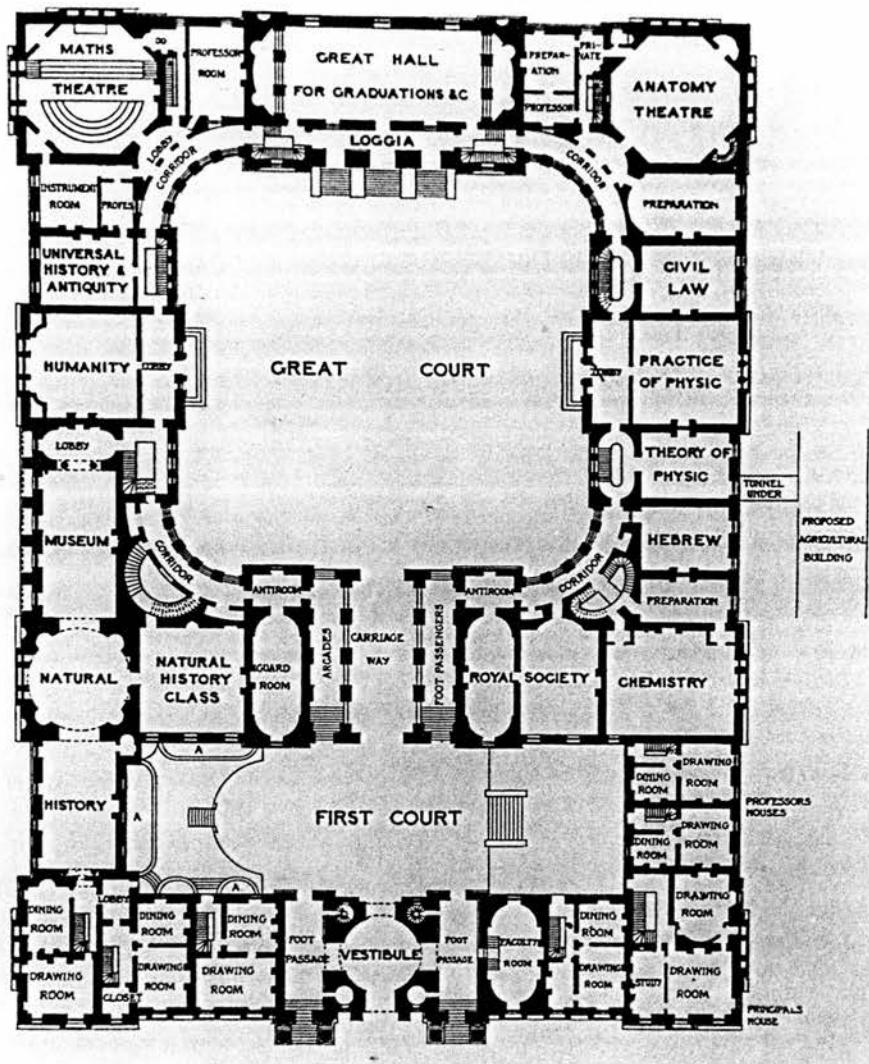


Fig. 9

New College, University of Edinburgh

Robert Adam 1789

Block plan of the principal floor of the Adam scheme.

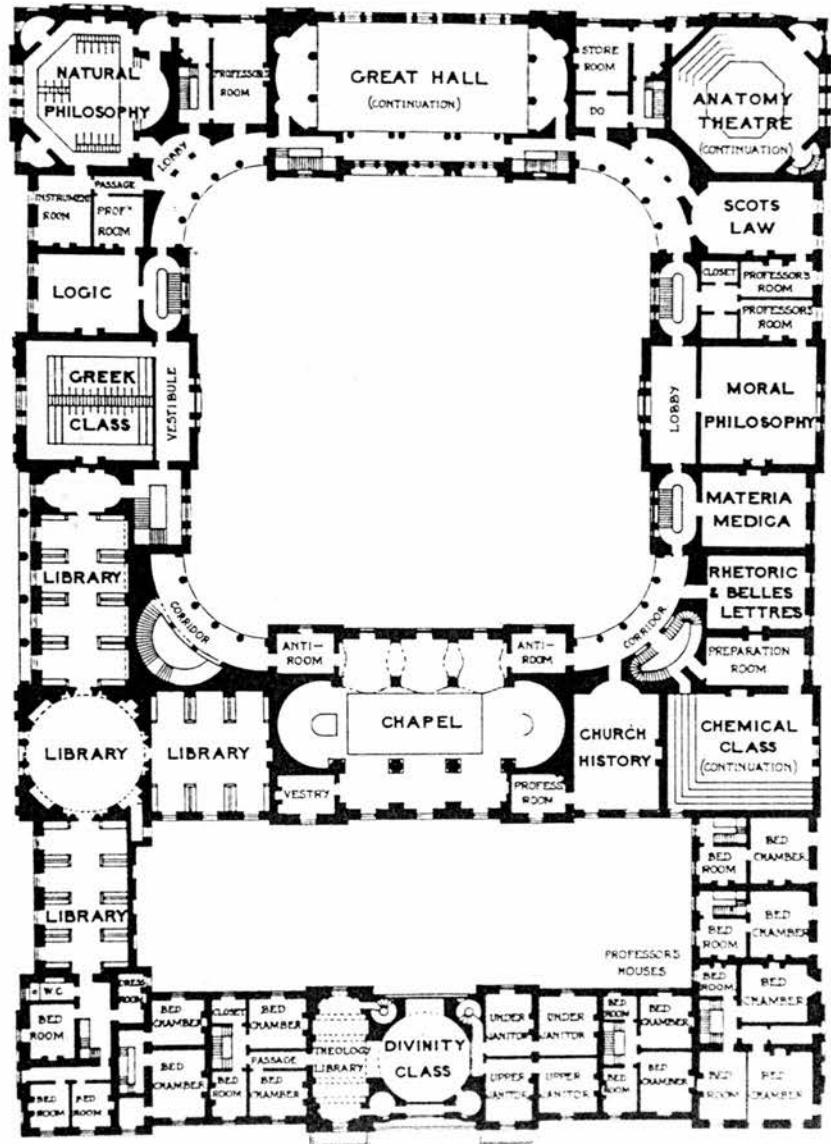


Fig. 10

New College, University of Edinburgh

Robert Adam 1789

Block plan of the upper floor of the Adam scheme.

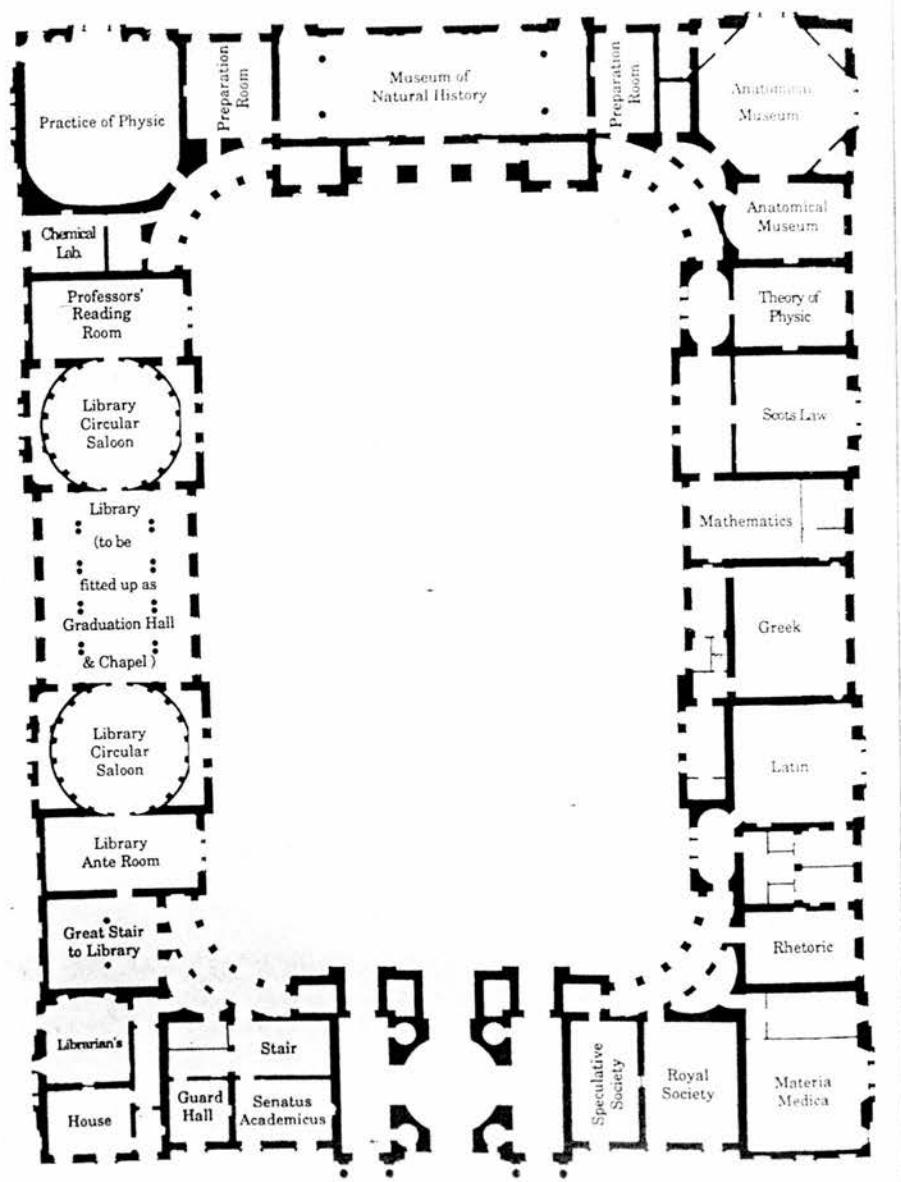


Fig. 11
New College, University of Edinburgh
William Henry Playfair 1816
Block plan of the principal floor.

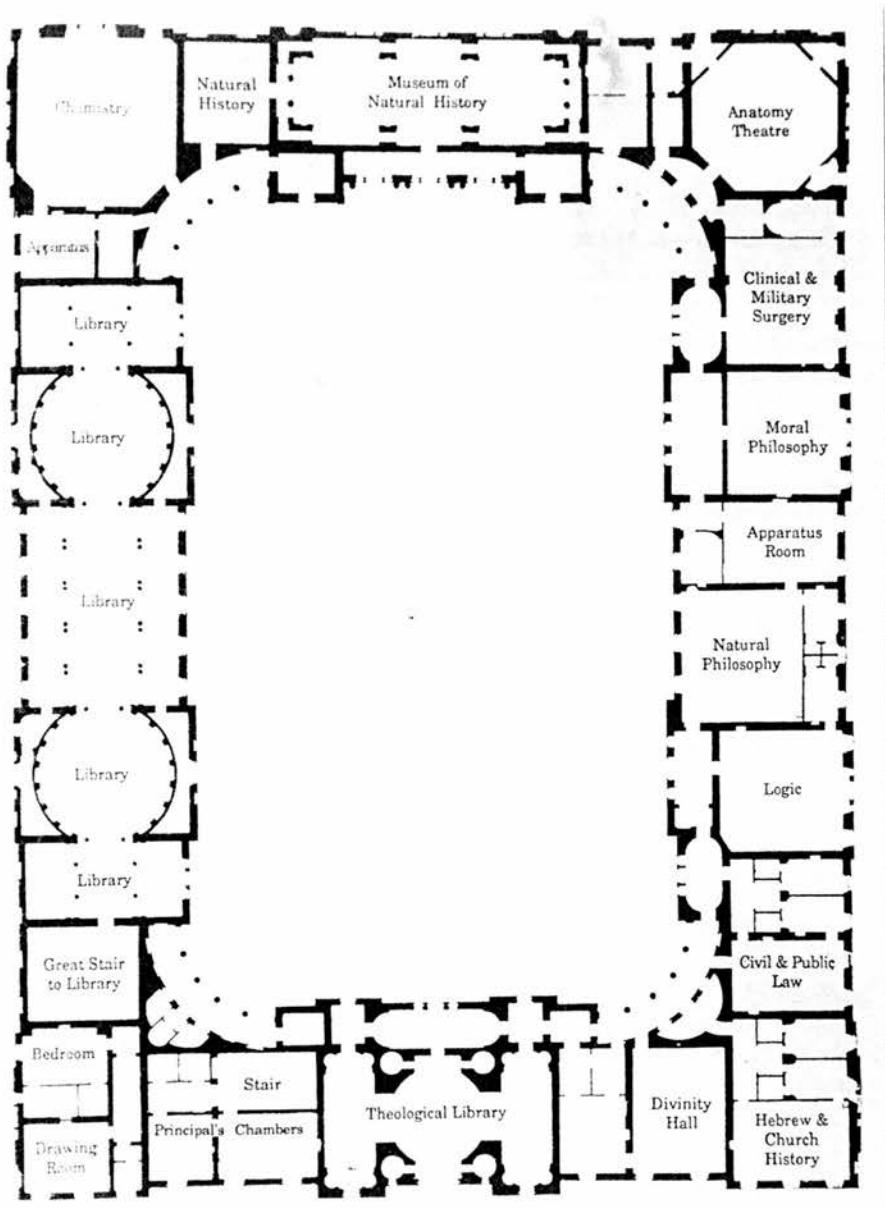


Fig. 12

New College, University of Edinburgh

William Henry Playfair 1816

Block plan of the upper floor.

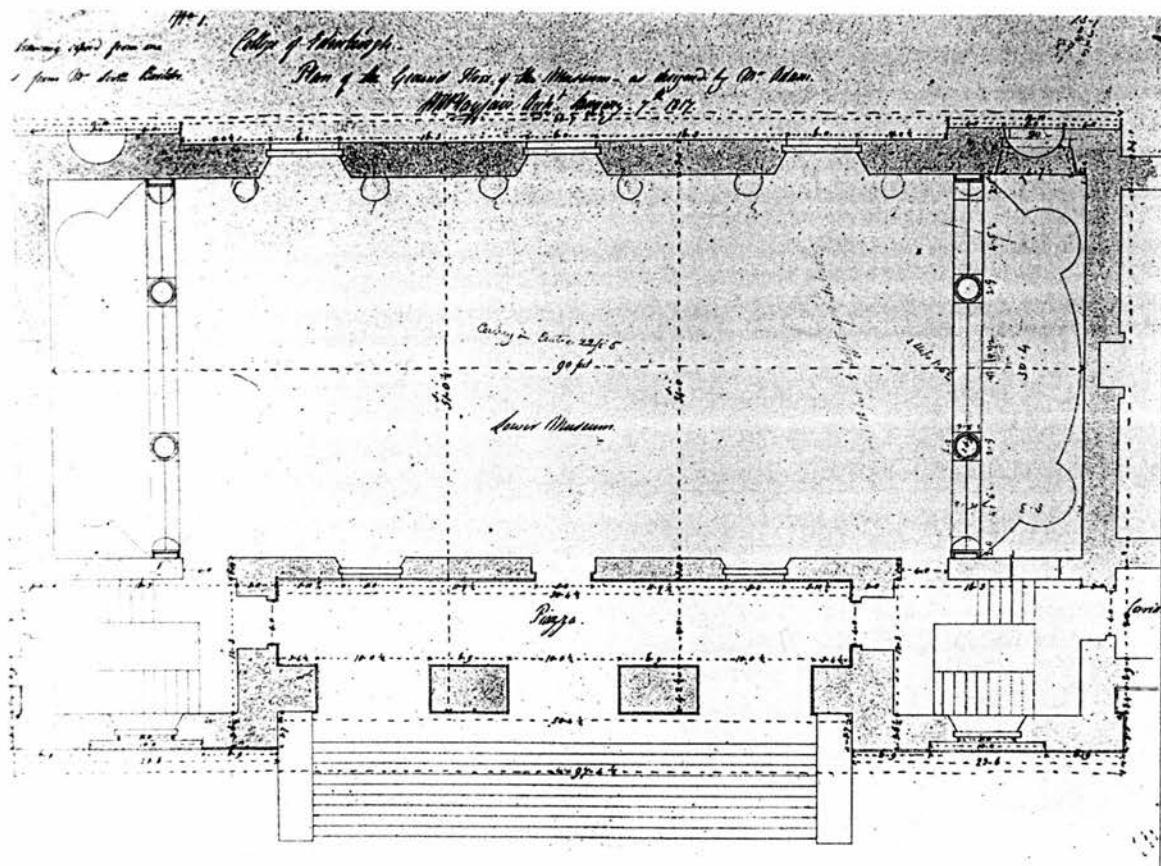


Fig. 13
Natural History Museum, New College, University of Edinburgh
Robert Adam 1789
Plan of the lower museum by William Henry Playfair.

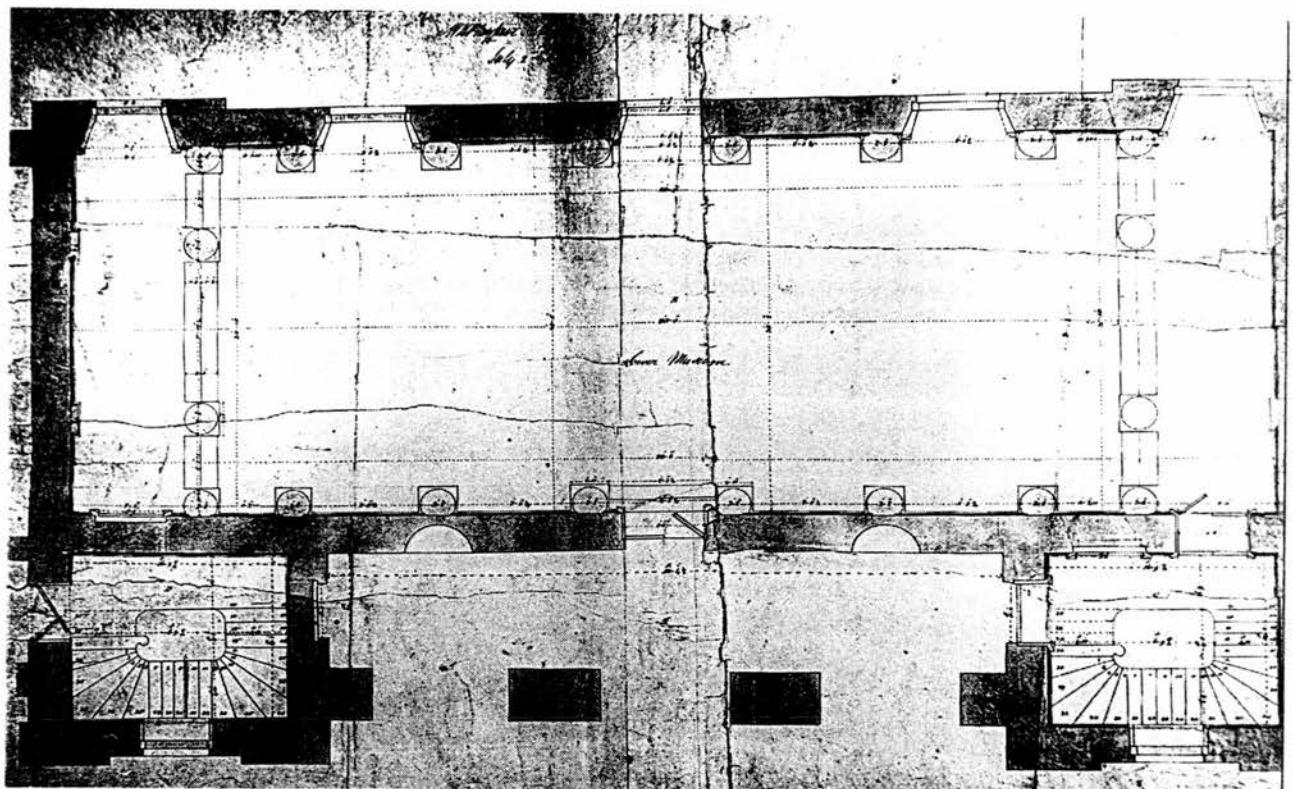


Fig. 14

Natural History Museum, New College, University of Edinburgh

William Henry Playfair 1816

Plan of the lower museum.

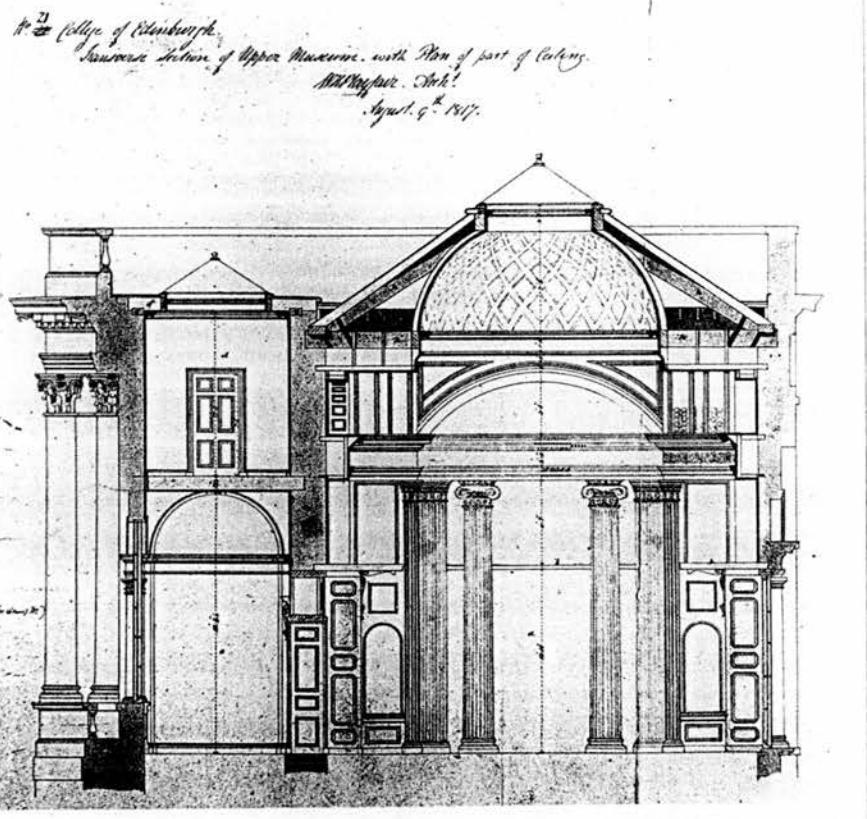


Fig. 15

Natural History Museum, New College, University of Edinburgh
William Henry Playfair 1816

Transverse section through the upper museum (looking south).

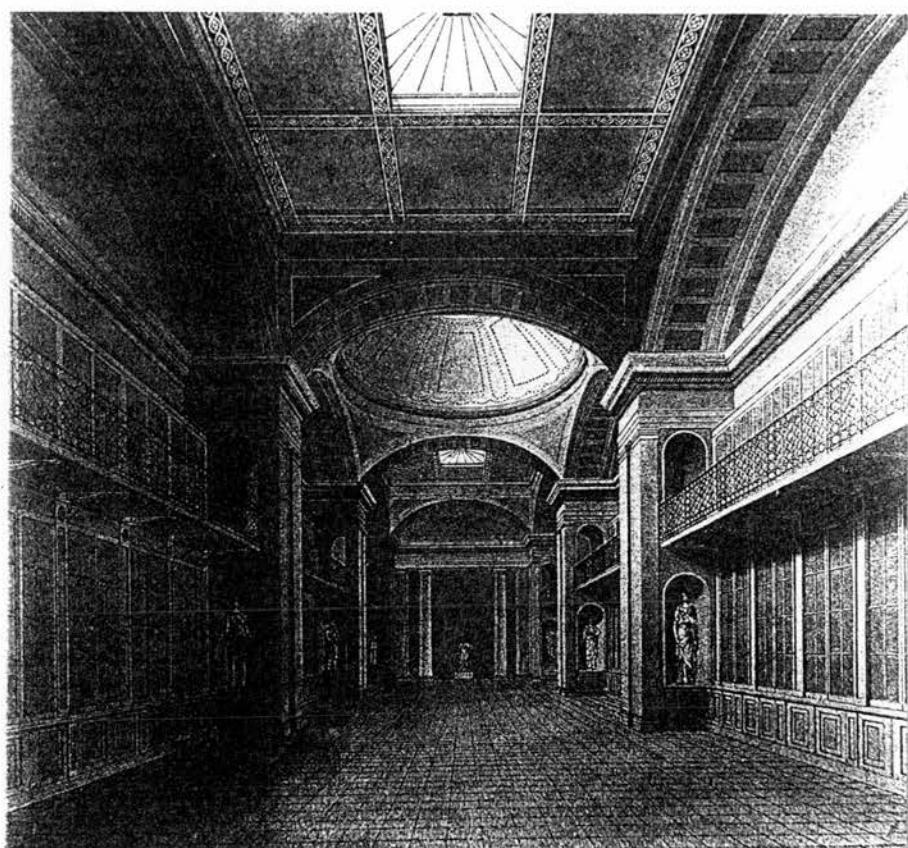


Fig. 16

Natural History Museum, New College, University of Edinburgh

William Henry Playfair 1817

Perspective view of the upper museum.

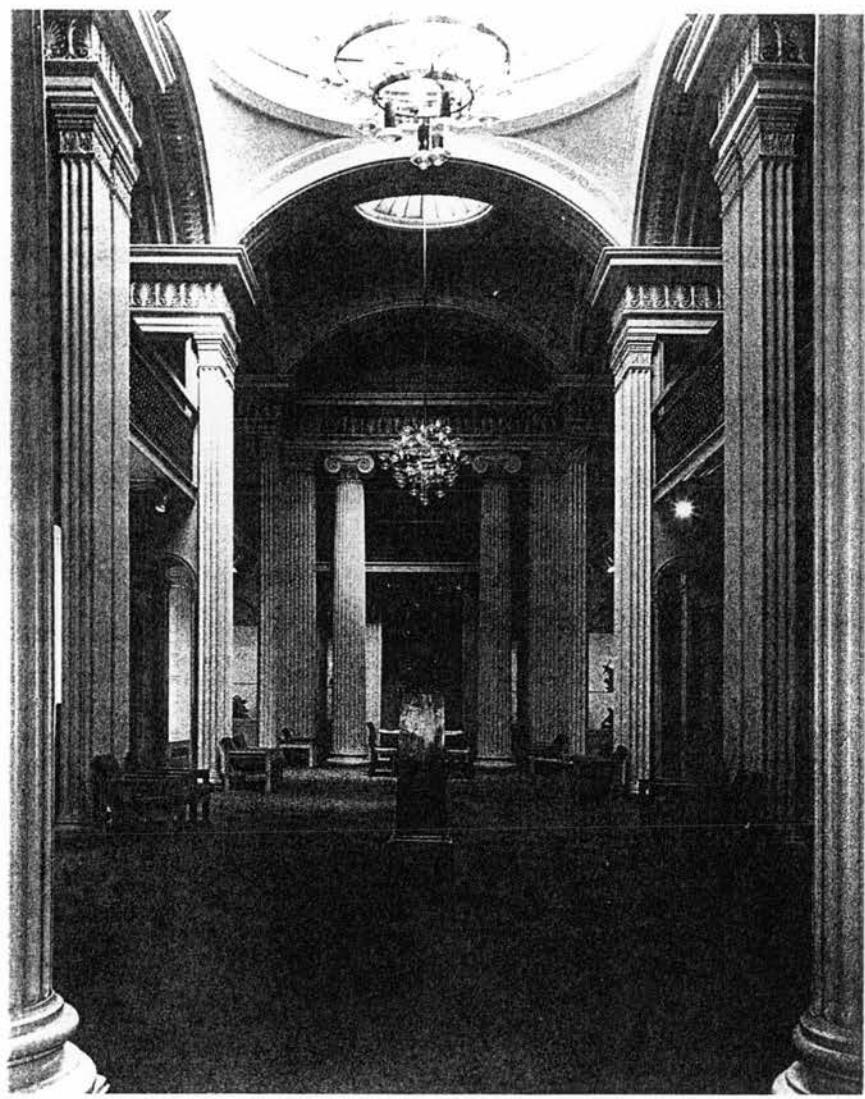


Fig. 17

Natural History Museum, New College, University of Edinburgh

William Henry Playfair 1817

Photograph of the upper museum.

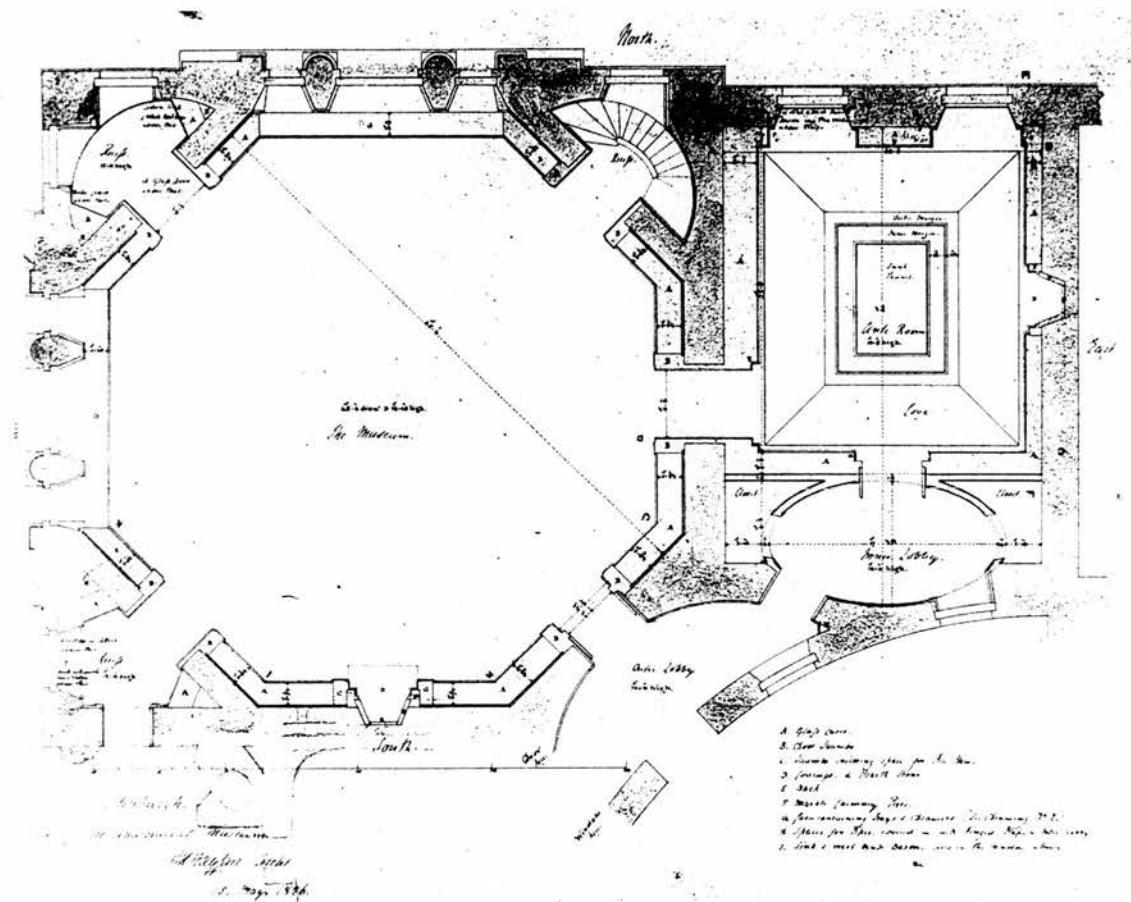


Fig. 18

Anatomy Museum, New College, University of Edinburgh

Robert Adam 1789

Plan of the museum by William Henry Playfair.

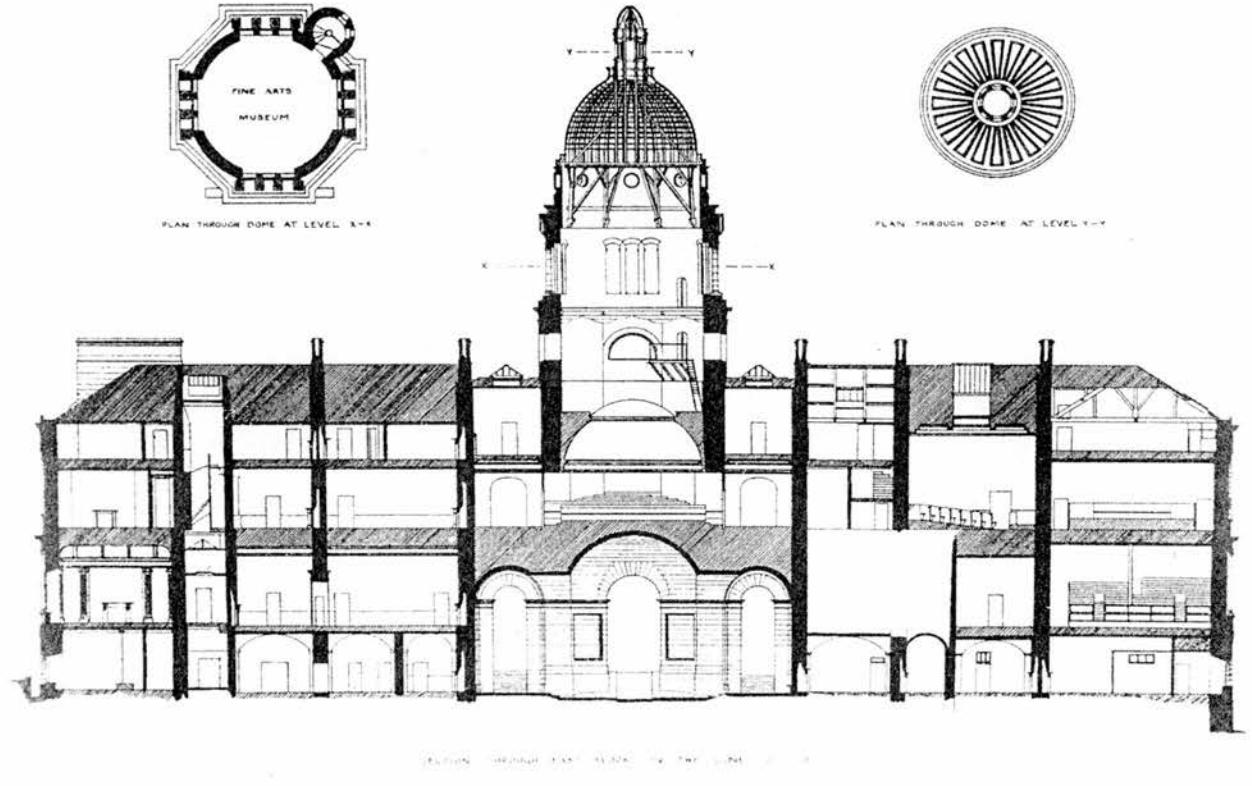


Fig. 19

New College, University of Edinburgh

Robert Rowand Anderson 1895

Section through the east range (looking west) showing Anderson's design for the dome. Plan of the Fine Arts Museum top left.

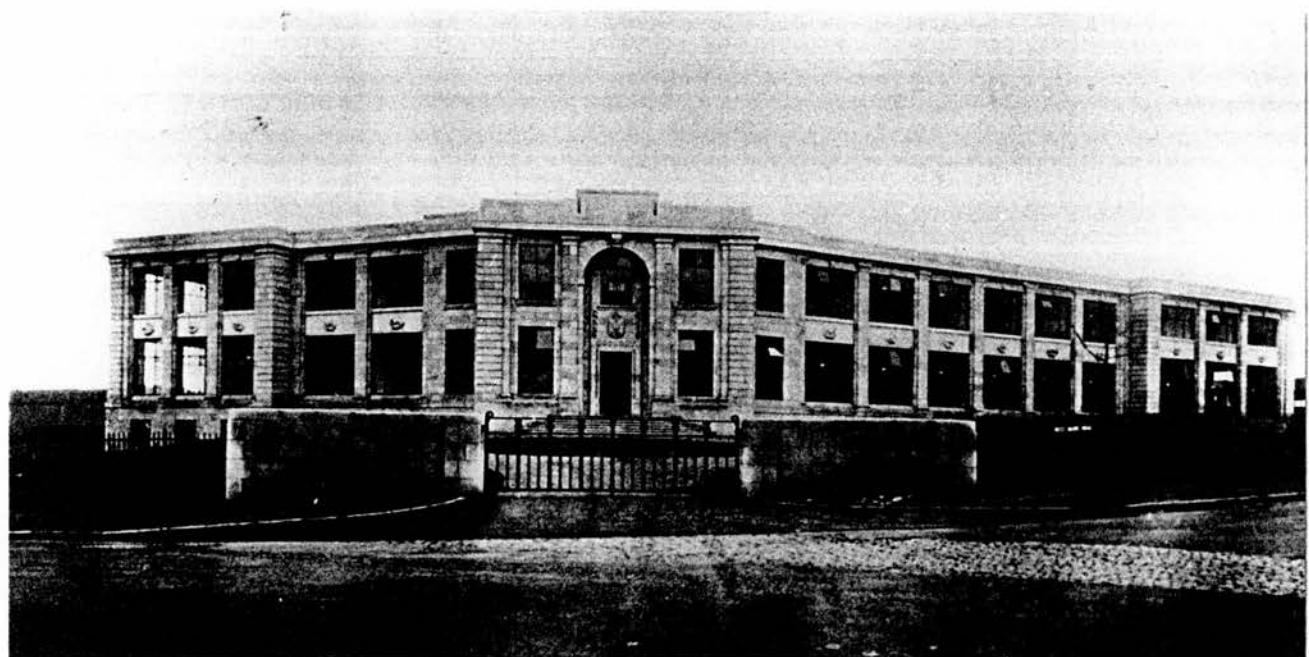


Fig. 20

Department of Zoology, Ashworth Building, University of Edinburgh

Robert Lorimer and John Fraser Matthew 1927

Photograph of the front (north) elevation.

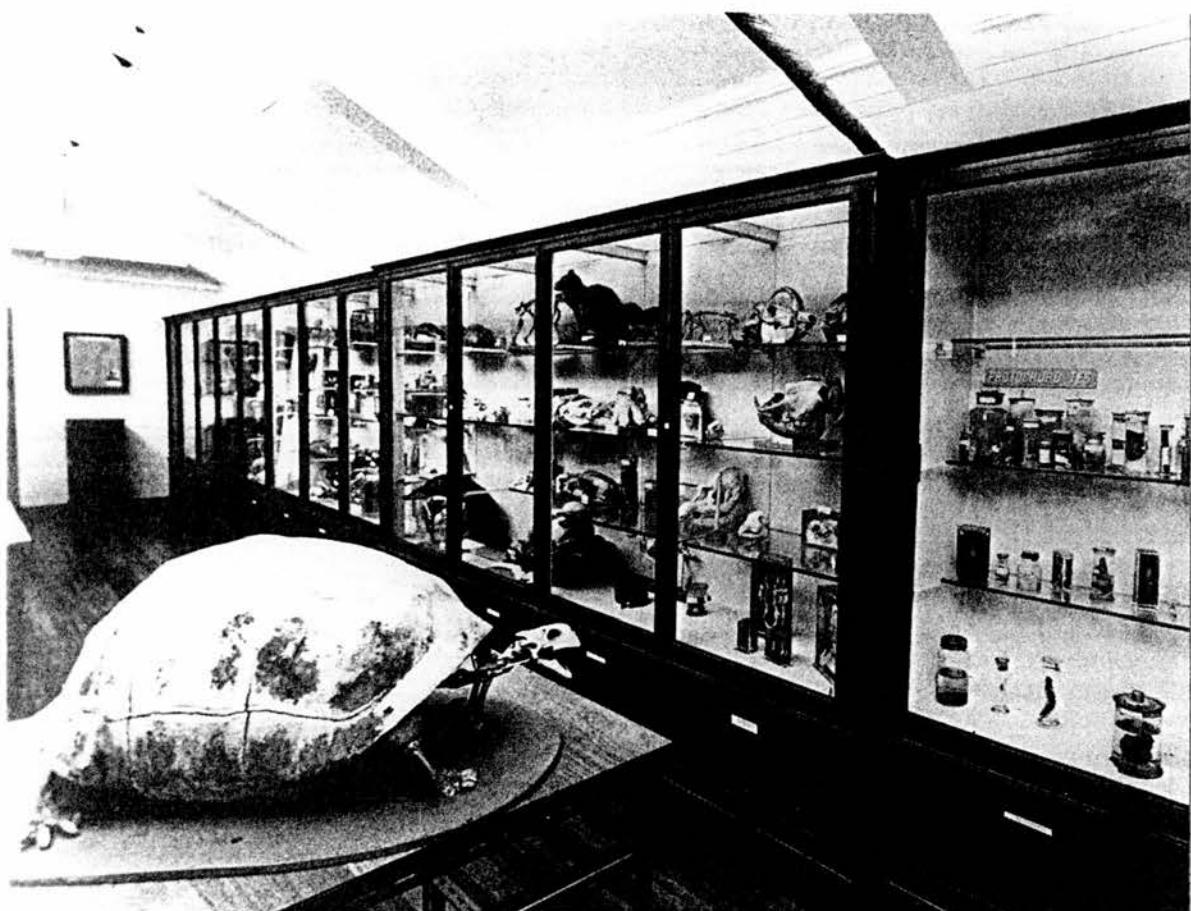


Fig. 21

Zoology Museum, Department of Zoology, Ashworth Building,
University of Edinburgh

Robert Lorimer and John Fraser Matthew 1927

Photograph of the mezzanine looking west.

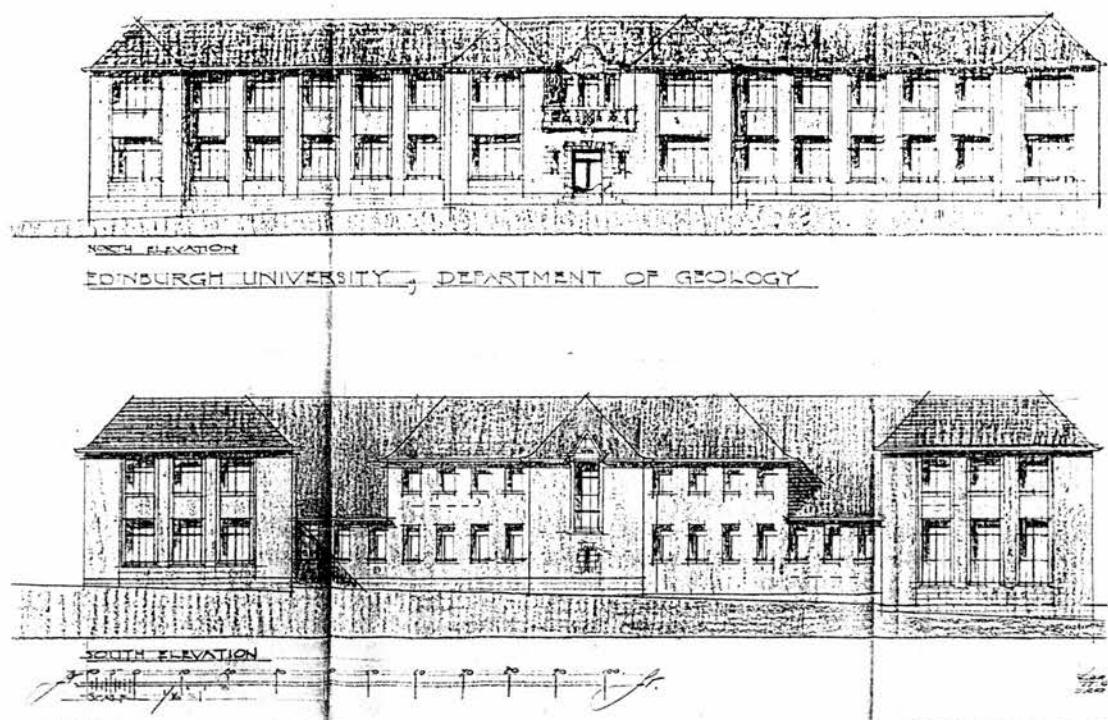


Fig. 22

Department of Geology, Grant Institute, University of Edinburgh

Robert Lorimer and John Fraser Matthew 1929

Perspective view of the north front (top) and rear (bottom) elevations. The central pavilion was remodelled in a later revision.

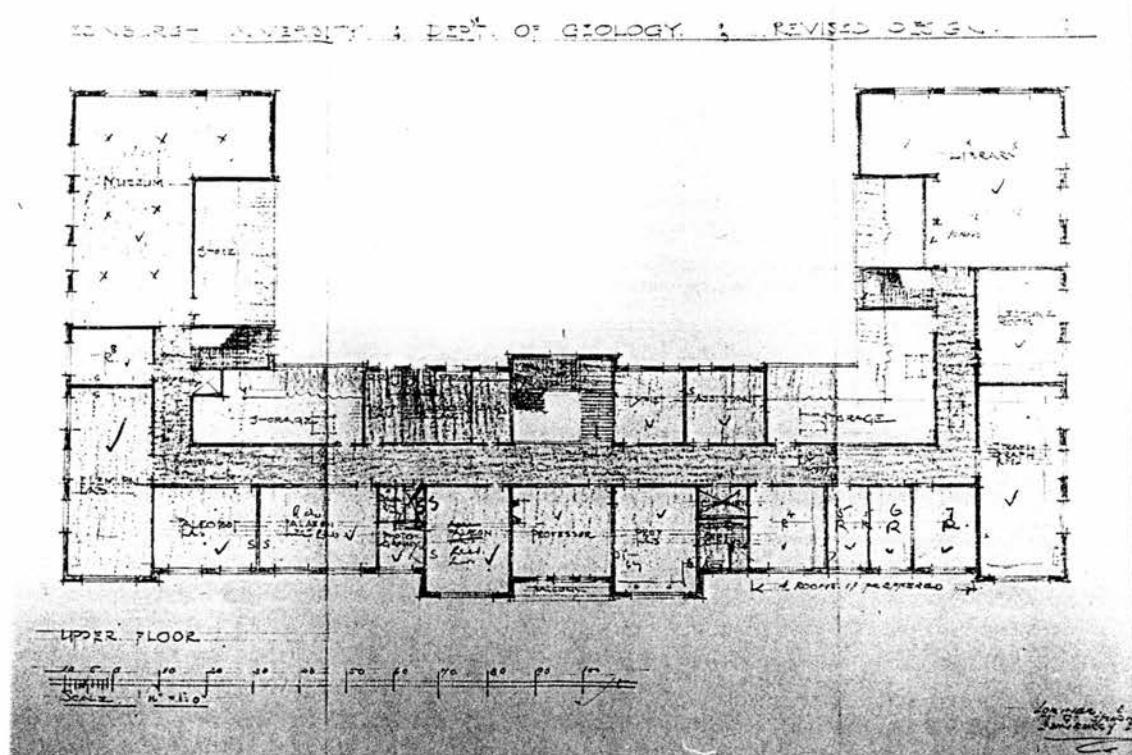


Fig. 23

Department of Geology, Grant Institute, University of Edinburgh

Robert Lorimer and John Fraser Matthew 1929

Block plan of the first floor.



Fig. 24

Department of Geology, Grant Institute, University of Edinburgh
Robert Lorimer and John Fraser Matthew 1929
Photograph of the front (north) elevation.

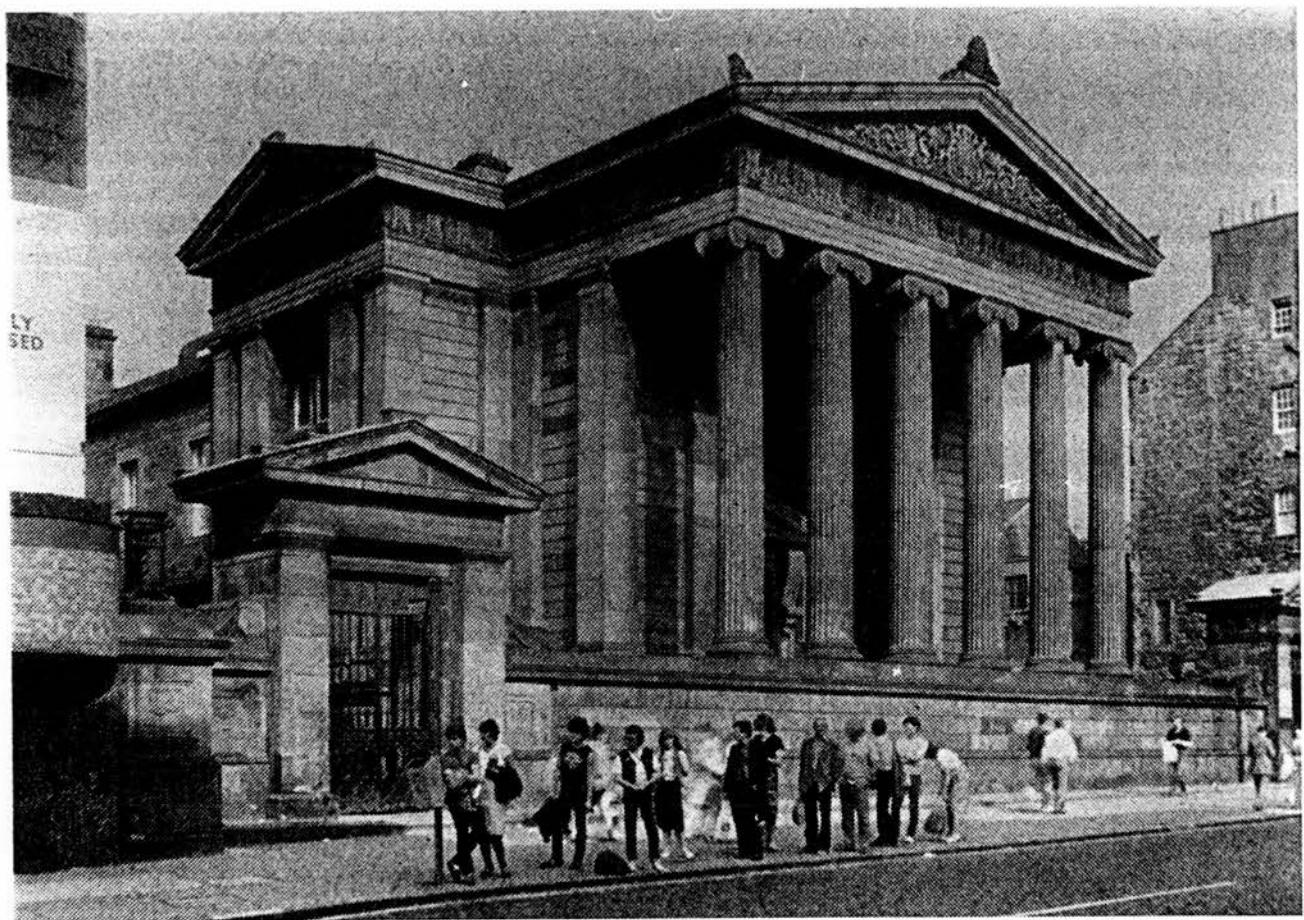


Fig. 25

Royal College of Surgeons, Edinburgh

William Henry Playfair 1829

Photograph of the front (west) elevation. Photograph shows the later Robert Rowand Anderson and Balfour Paul extension to the north (1908).

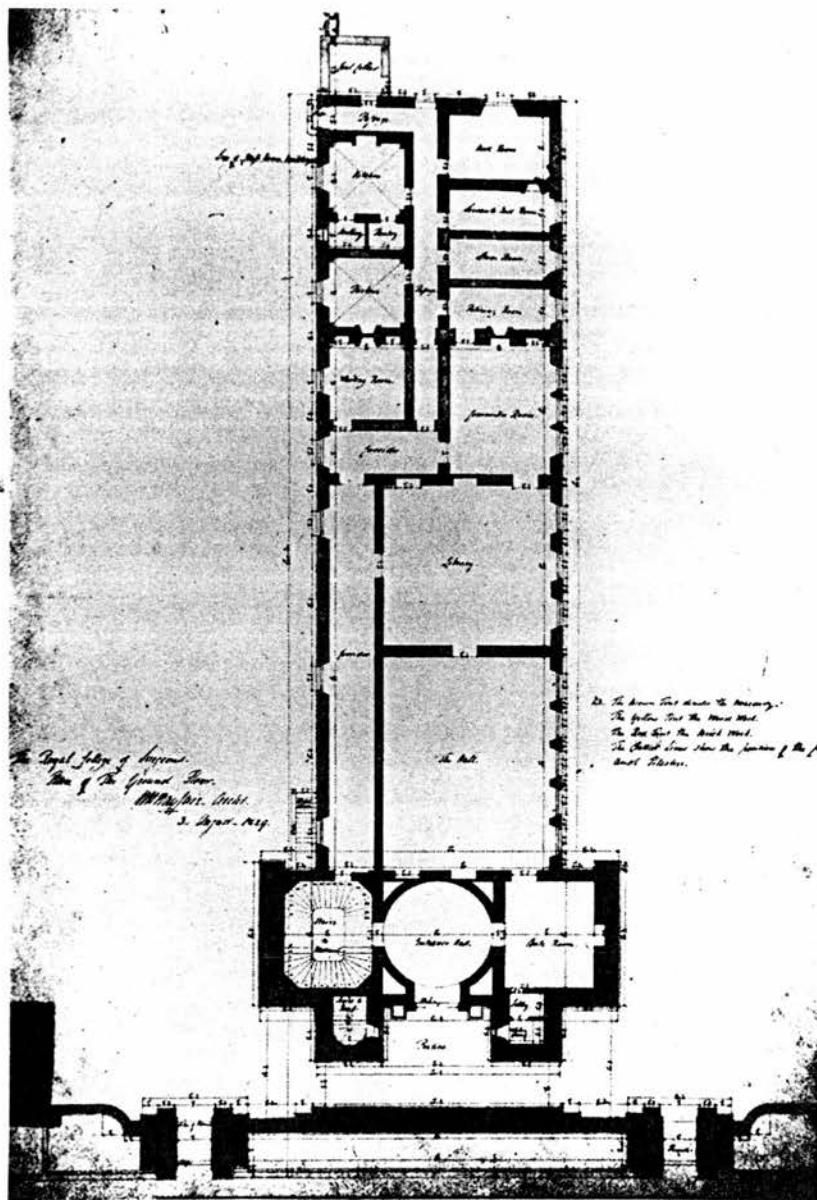


Fig. 26

Royal College of Surgeons, Edinburgh

William Henry Playfair 1829

Ground floor plan.

to reflect the value the College placed on the building was designed to house the

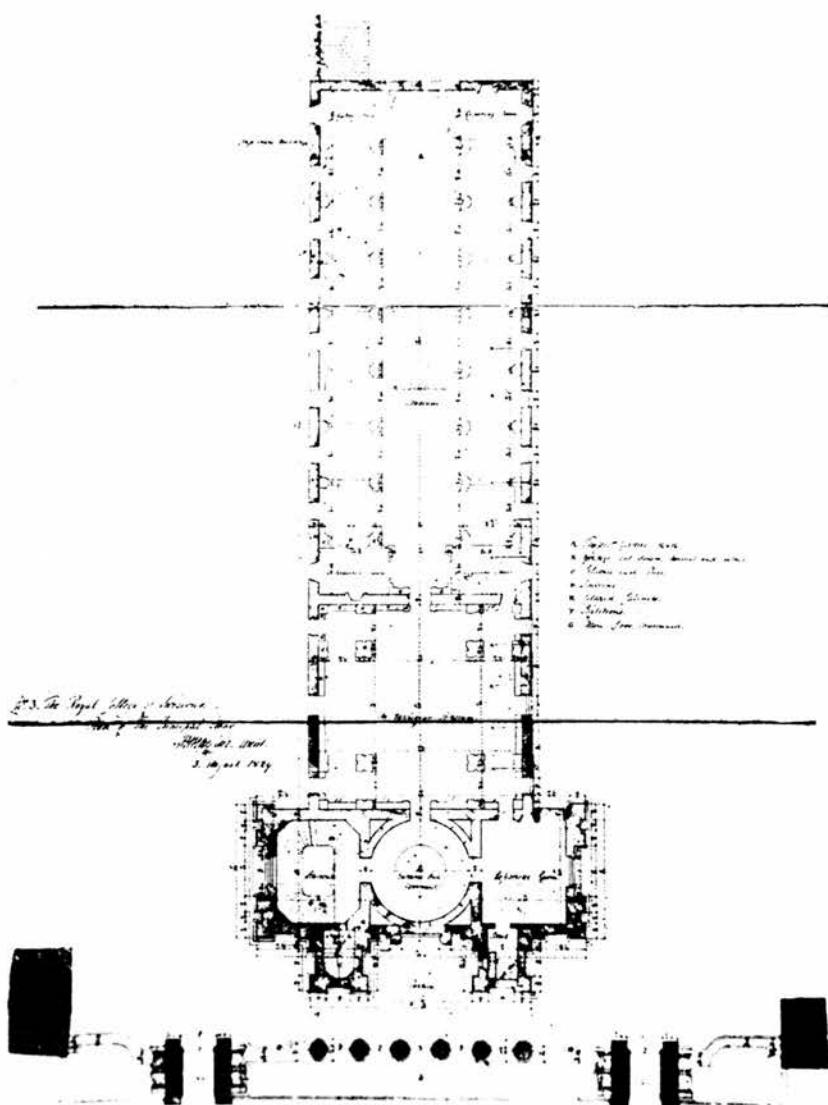


Fig 5

Playfair's Plan of the Royal College of Surgeons, Edinburgh, 1829.

Fig. 27

Royal College of Surgeons, Edinburgh

William Henry Playfair 1829

First floor plan.

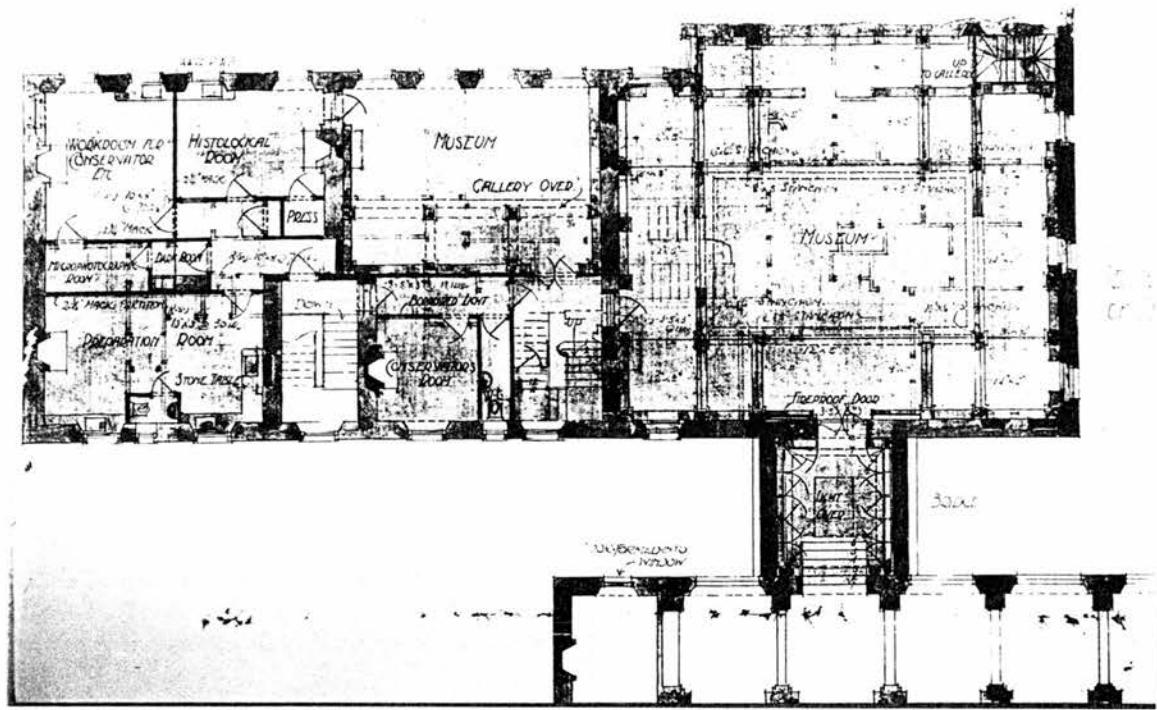


Fig. 28

New Barclay Museum, Royal College of Surgeons, Edinburgh
Robert Rowand Anderson and Arthur Forman Balfour Paul 1908
Plan of the second floor of the proposed conversion of tenements
(No.s 7 - 9 Hill Square) for the New Barclay Museum.

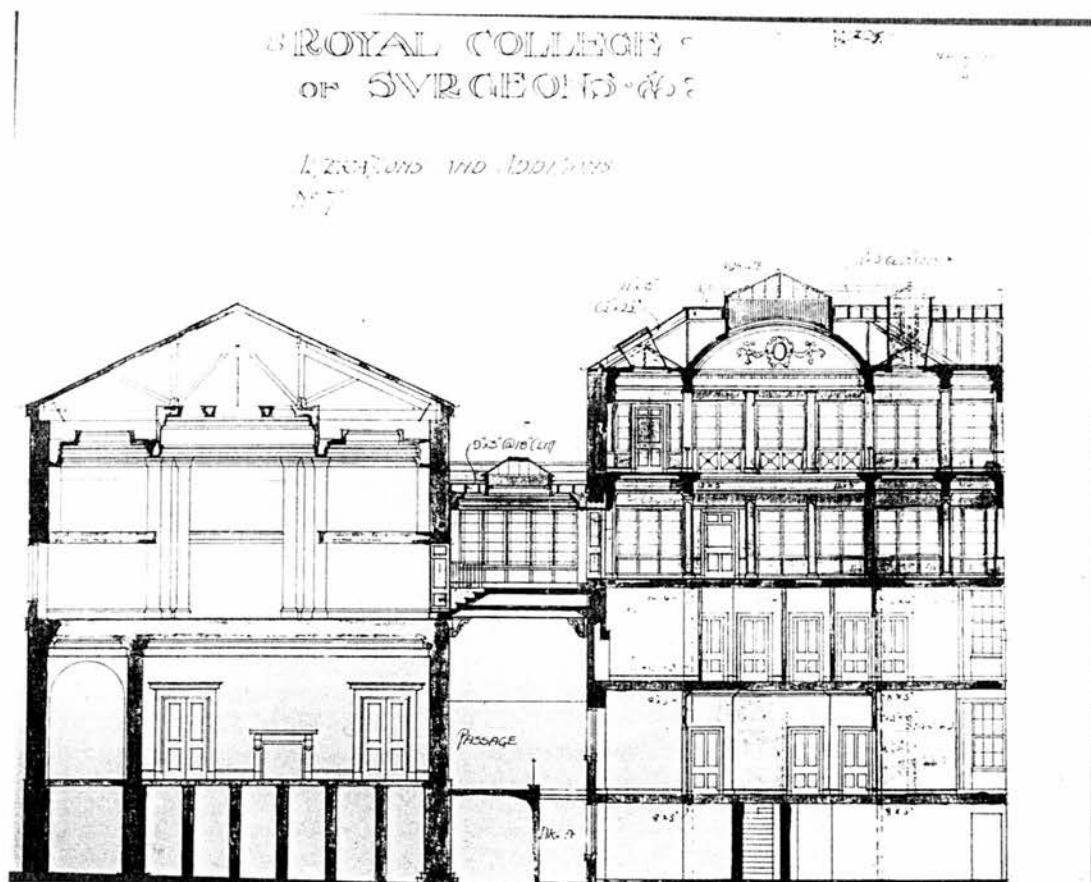


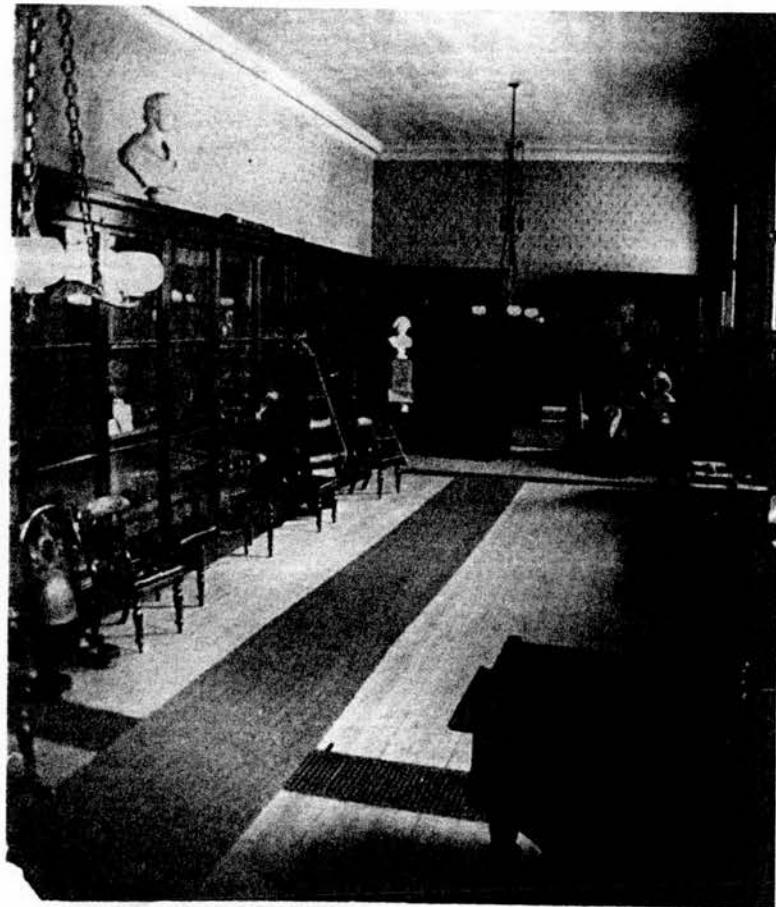
Fig. 29

New Barclay Museum, Royal College of Surgeons, Edinburgh
Robert Rowand Anderson and Arthur Forman Balfour Paul 1908
Transverse section (looking east) through the New Barclay Museum
(right) and Playfair's Pathological and Anatomical Museum (left).



Fig. 30

New Barclay Museum, Royal College of Surgeons, Edinburgh
Robert Rowand Anderson and Arthur Forman Balfour Paul 1908
Photograph of the interior of the museum.



Musical instrument room, Park Place.

Fig. 31

Museum of the Reid School of Music, University of Edinburgh

David Cousin 1874

Photograph of the interior (looking west).

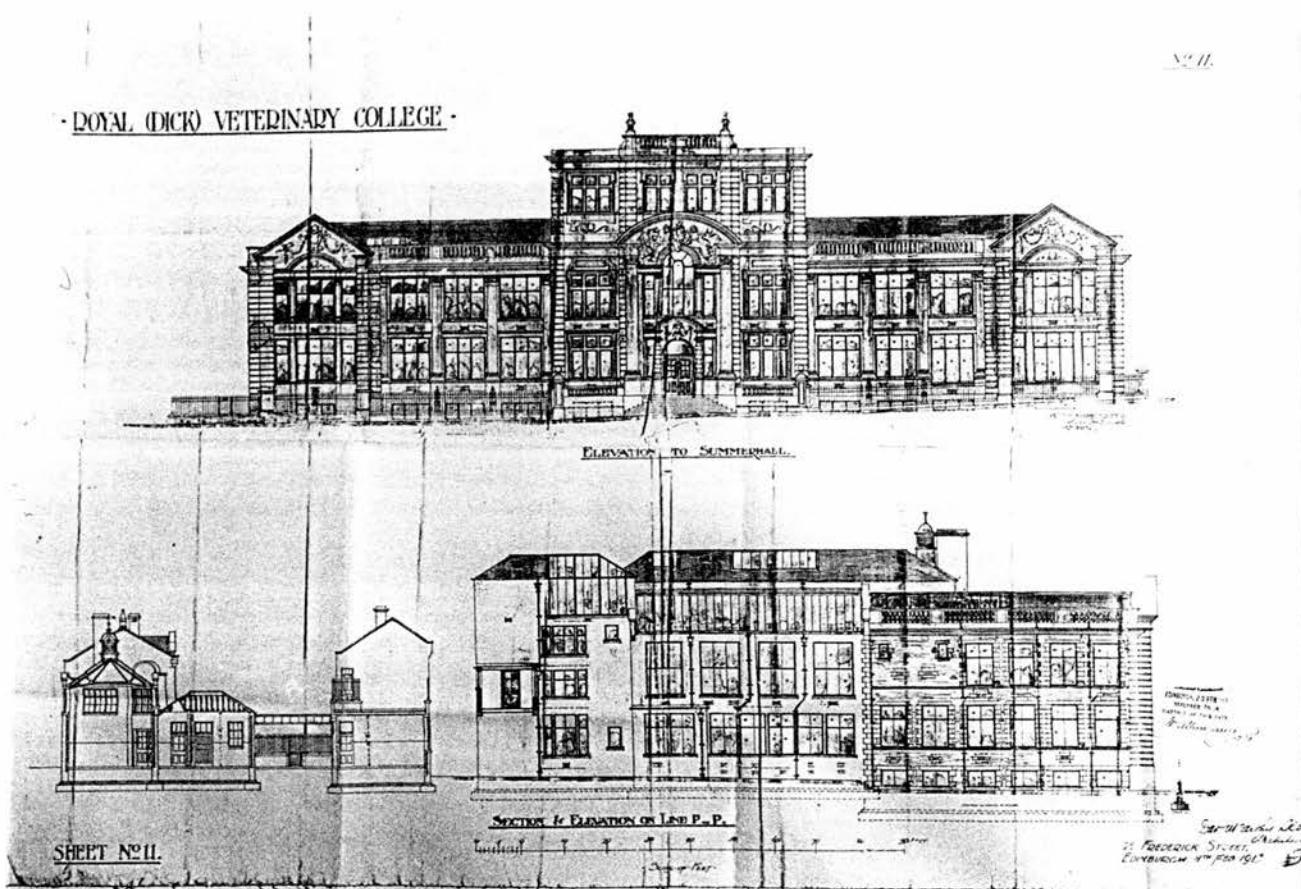


Fig. 32

Royal (Dick) Veterinary College, Edinburgh

David McCarthy 1913

Front elevation (top) and section and elevation (looking south) (bottom).

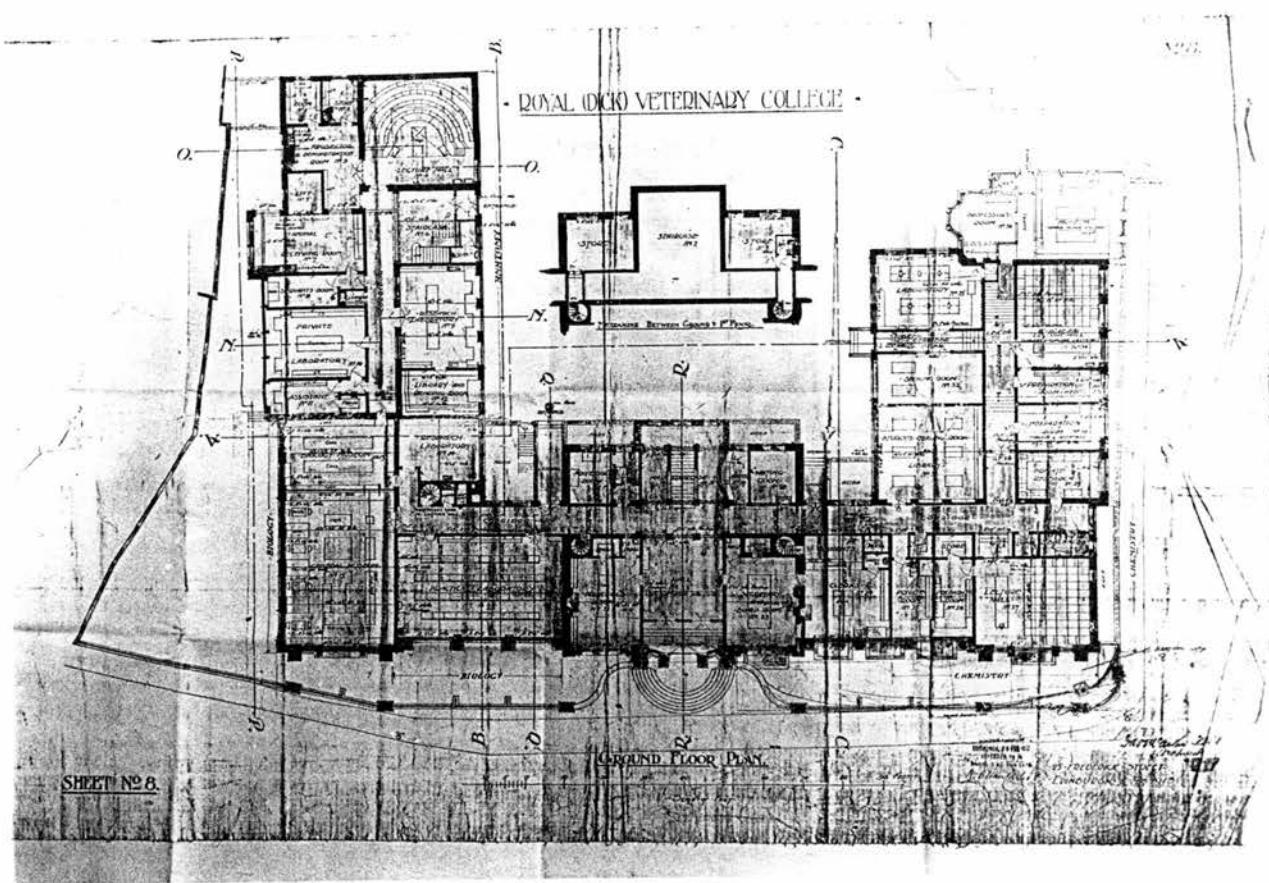


Fig. 33

Royal (Dick) Veterinary College, Edinburgh

David McCarthy 1913

Block plan of the ground floor. General Museum to the north west (bottom left).

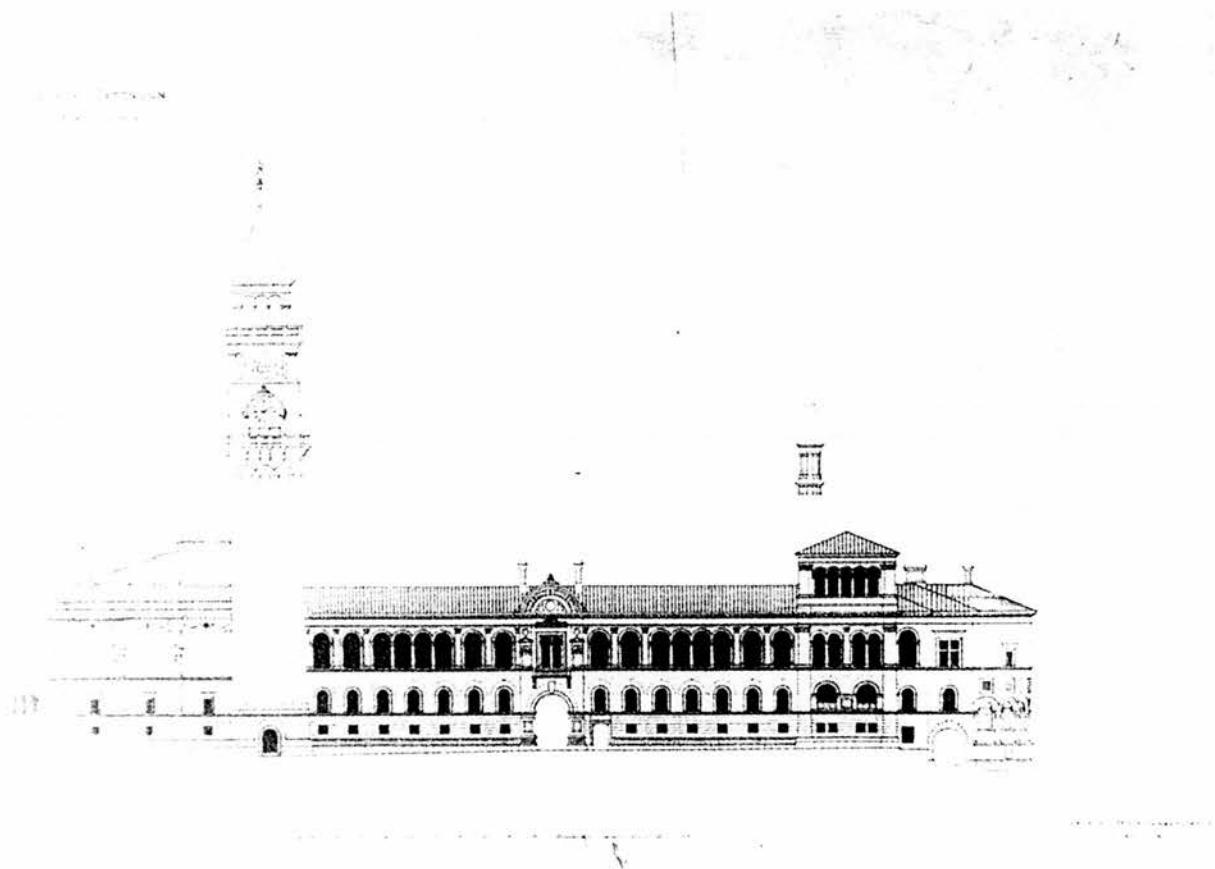


Fig. 34

Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Drawing of the front (north) elevation. The campanile was never built. The McEwan Hall (to the extreme left)) was erected later.



Fig. 35

Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Photograph of the Great (north) Court c.1890.

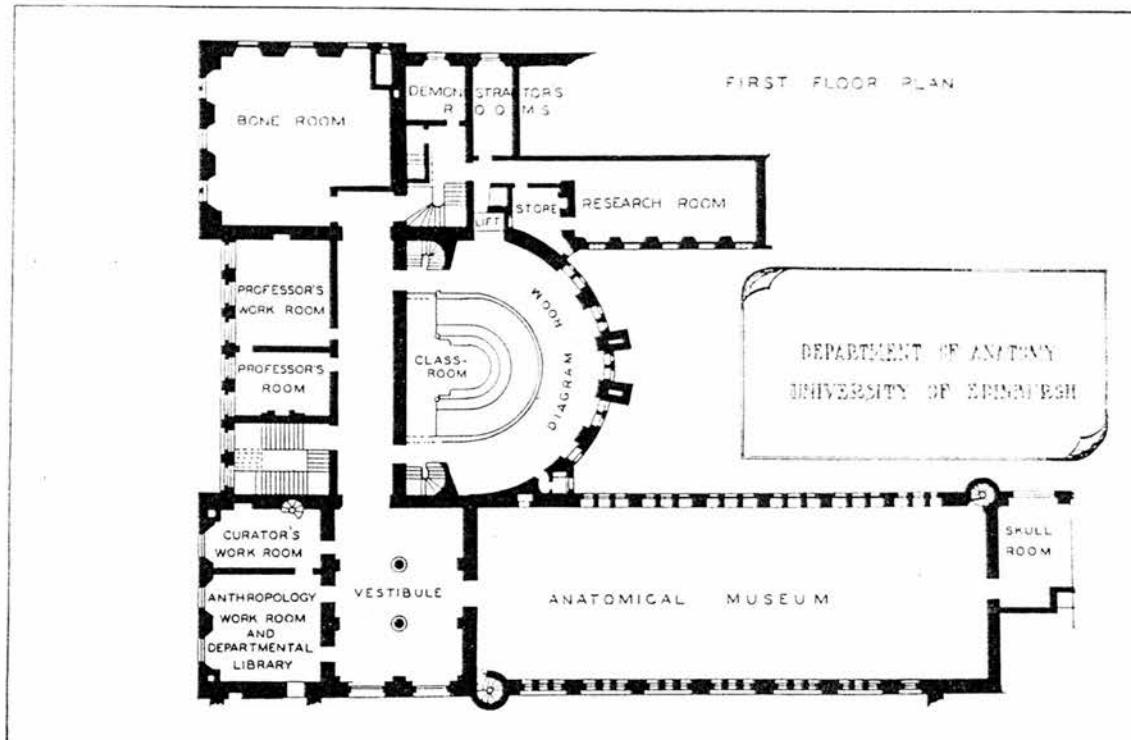


Fig. 36

Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Block plan of the first floor of the private (south) court.

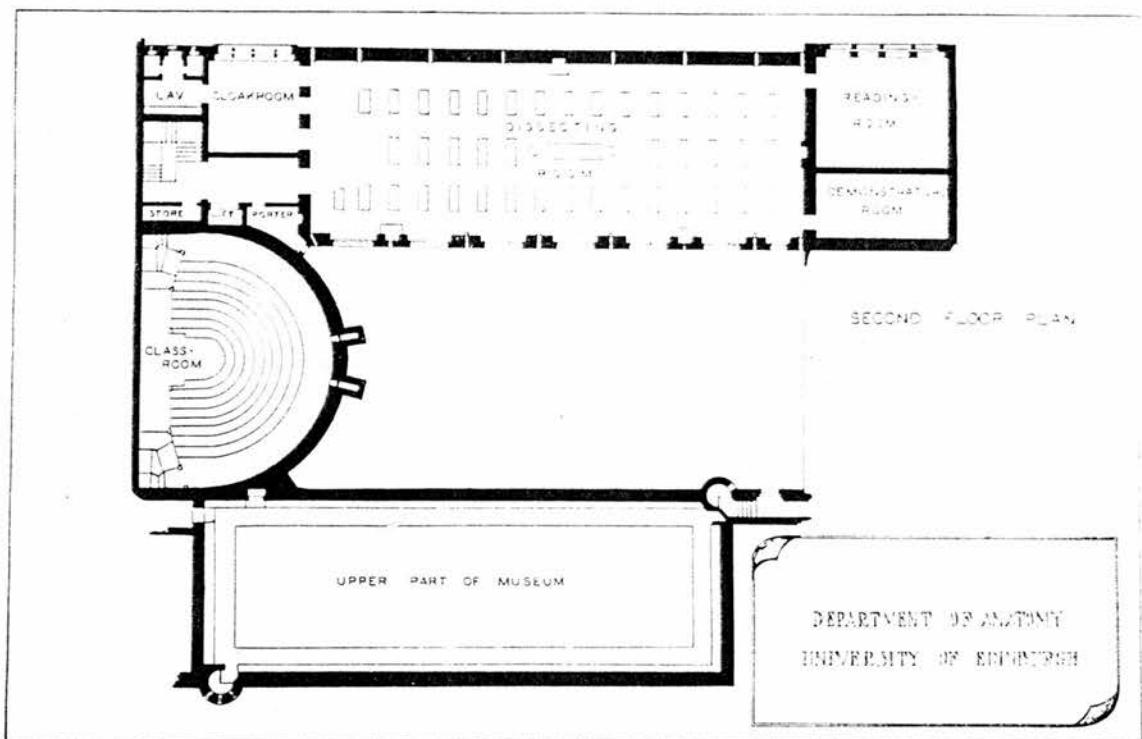


Fig. 3

Fig. 37

Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Block plan of the second floor of the private (south) court.

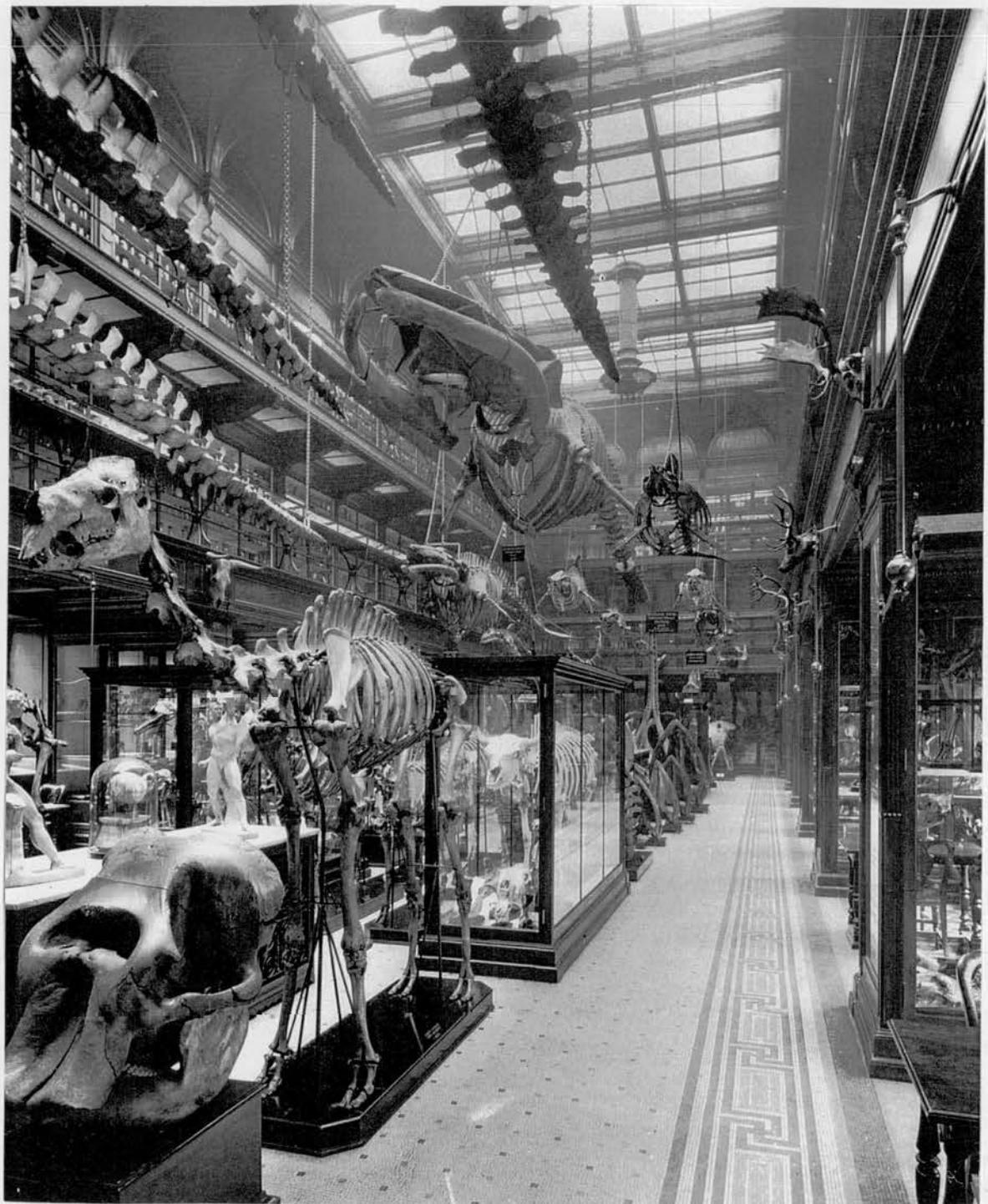


Fig. 38

Anatomy Museum, Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Photograph of the interior of the museum c.1920.



Fig. 39

The Skull Room, Medical School, University of Edinburgh

Robert Rowand Anderson 1878

Photograph of the interior looking north.

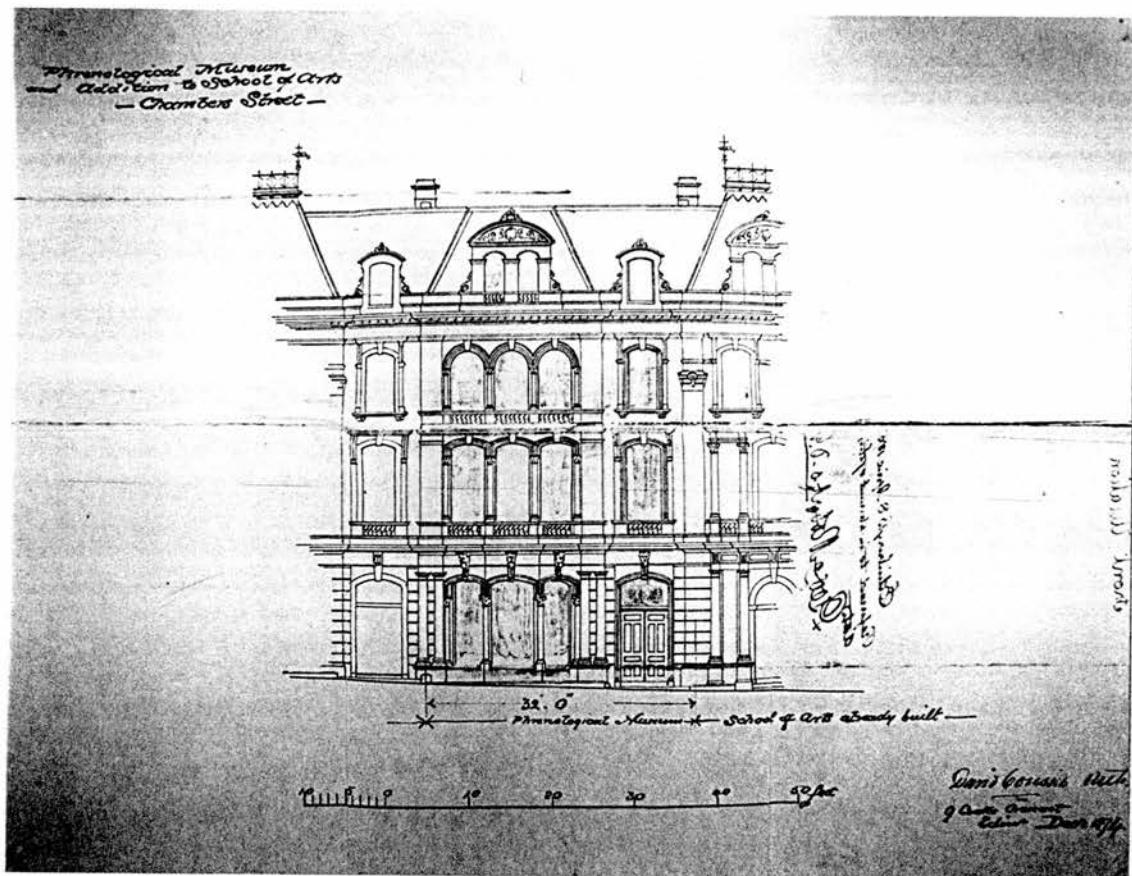


Fig. 40

Phrenological Museum, Chambers Street, Edinburgh

David Cousin 1874

Front (south) elevation.

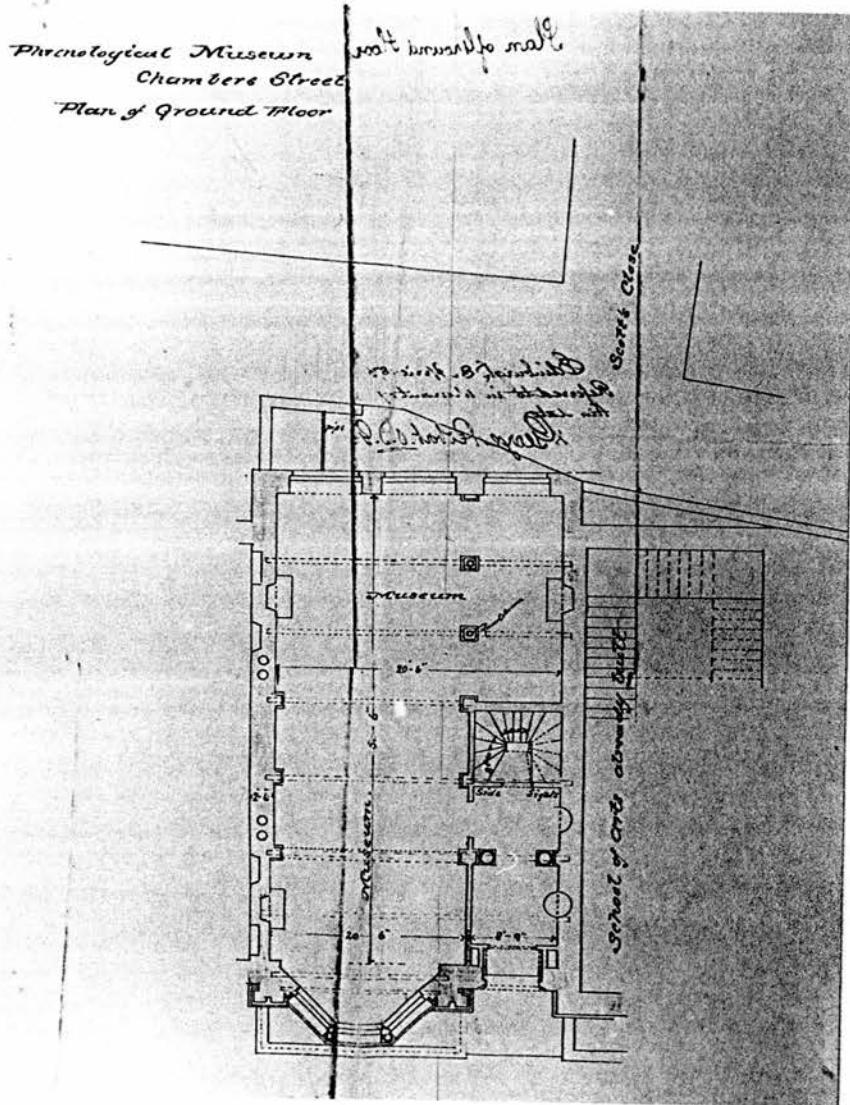


Fig. 41

Phrenology Museum, Chambers Street, Edinburgh

David Cousin 1874

Plan of the ground floor.

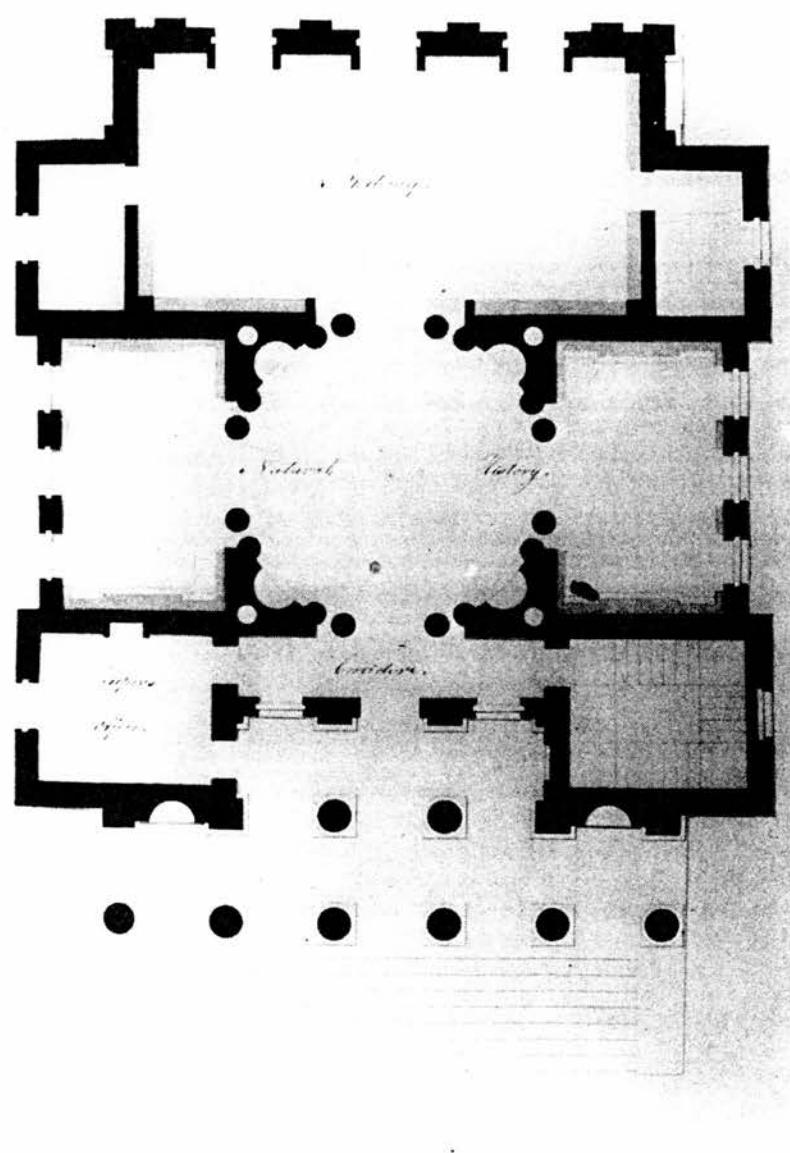


Fig. 42

Old Hunterian Museum, University of Glasgow

William Stark 1804

Plan of the ground floor.

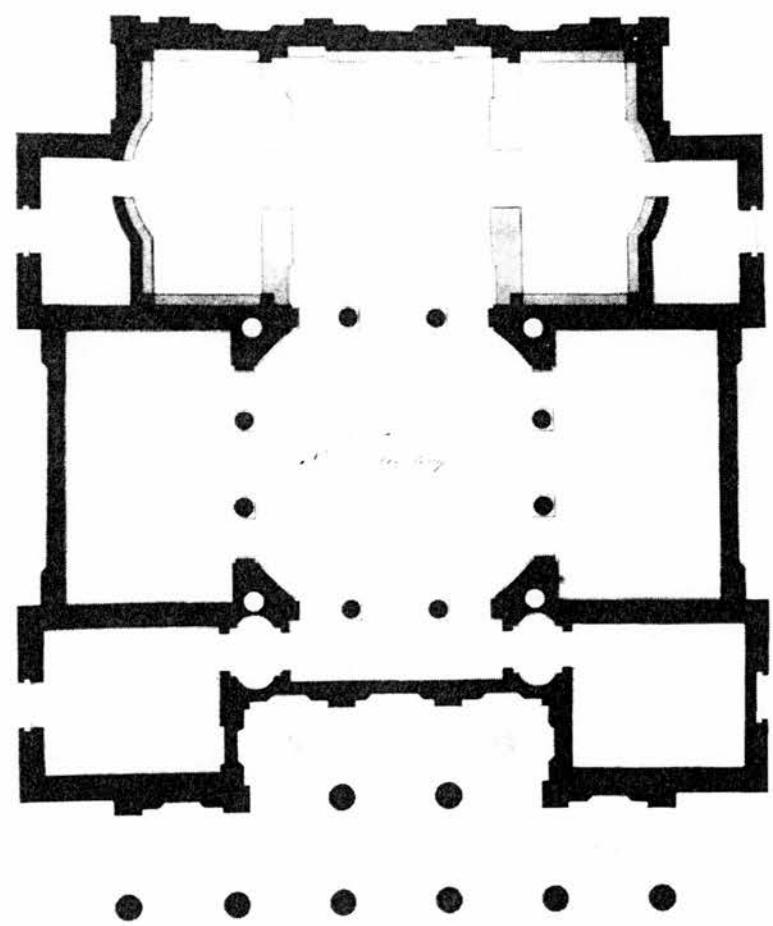


Fig. 43
Old Hunterian Museum, University of Glasgow
William Stark 1804
Plan of the first floor.

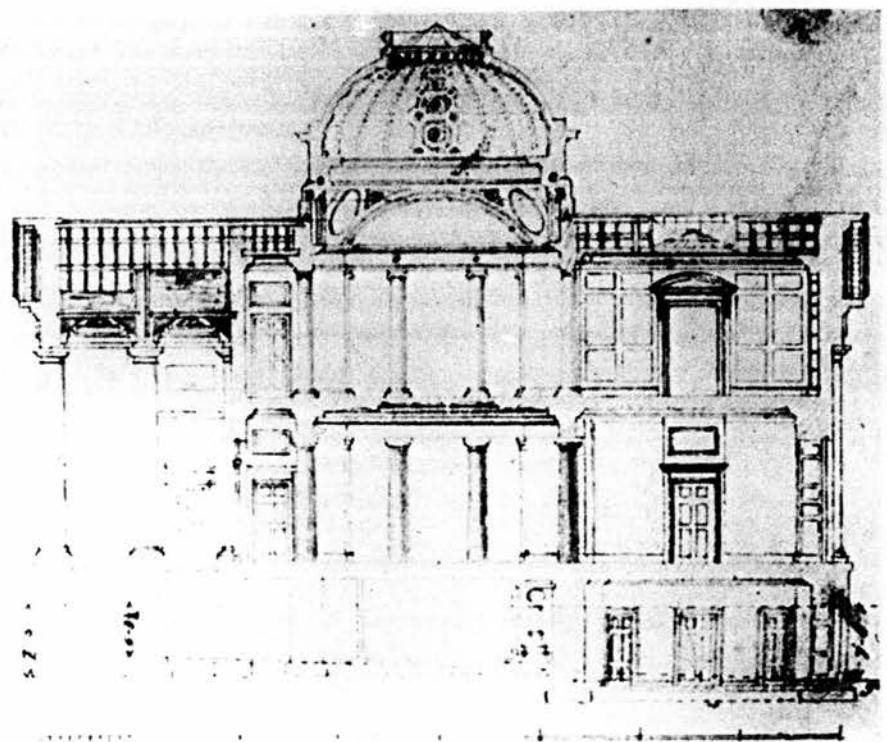


Fig. 44

Old Hunterian Museum, University of Glasgow

William Stark 1804

Longitudinal section.



Fig. 45

Old Hunterian Museum, University of Glasgow

William Stark 1804

Side elevation.

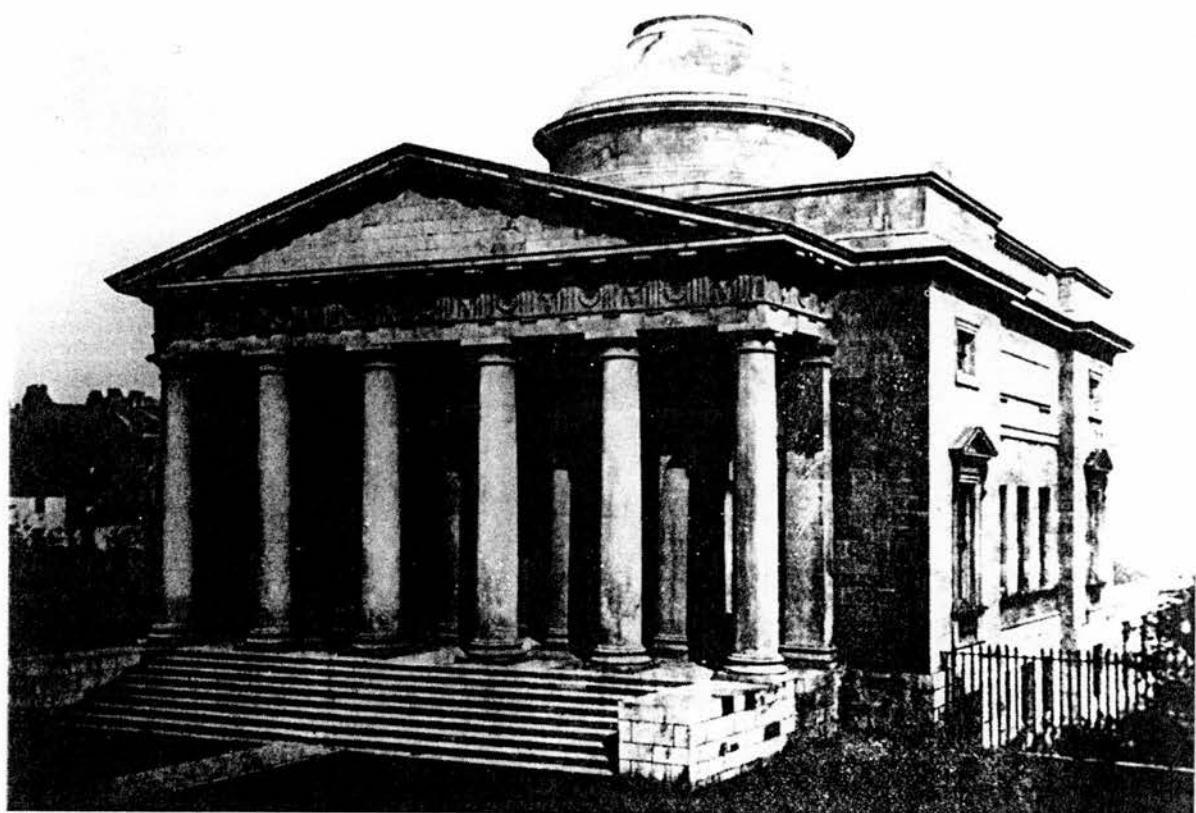


Fig. 46

Old Hunterian Museum, University of Glasgow

William Stark 1804

Photograph of the front elevation.

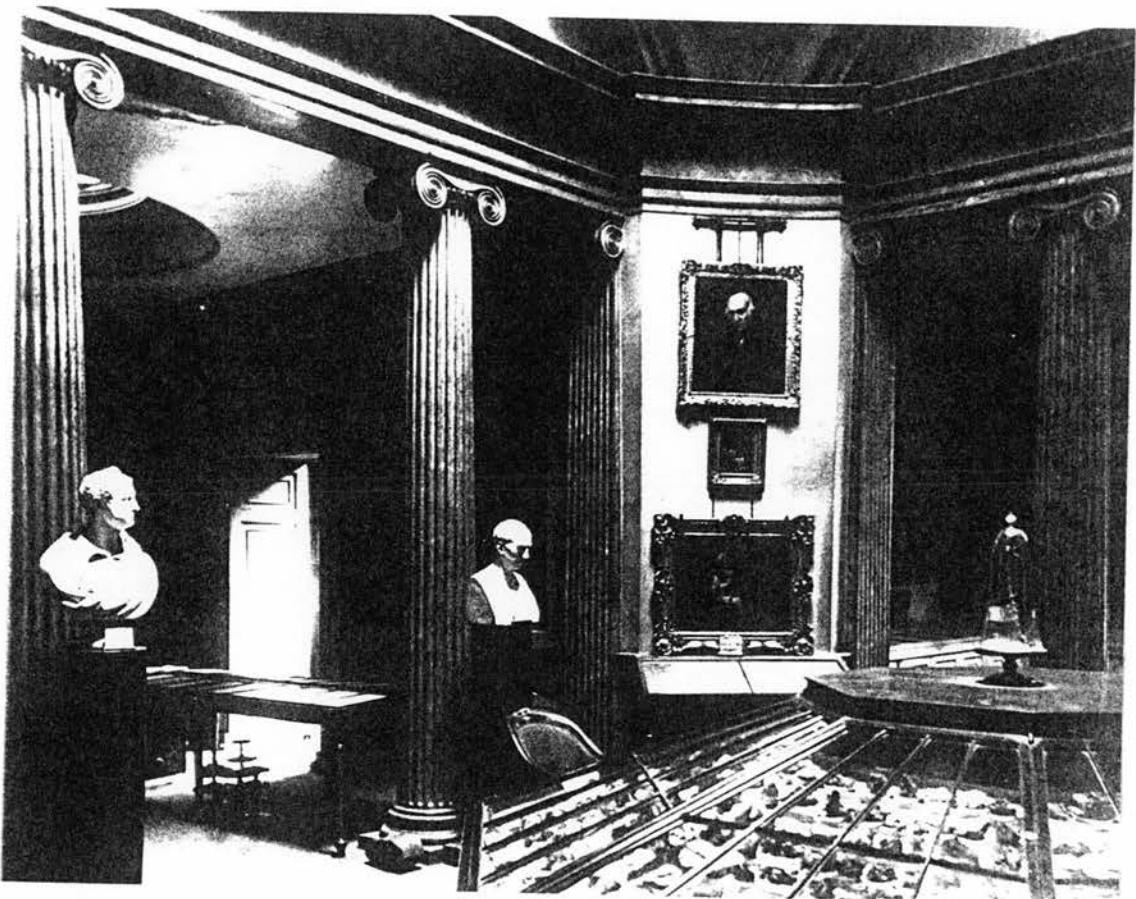


Fig. 47

Old Hunterian Museum, University of Glasgow

William Stark 1804

Photograph of the interior of the picture gallery, first floor.

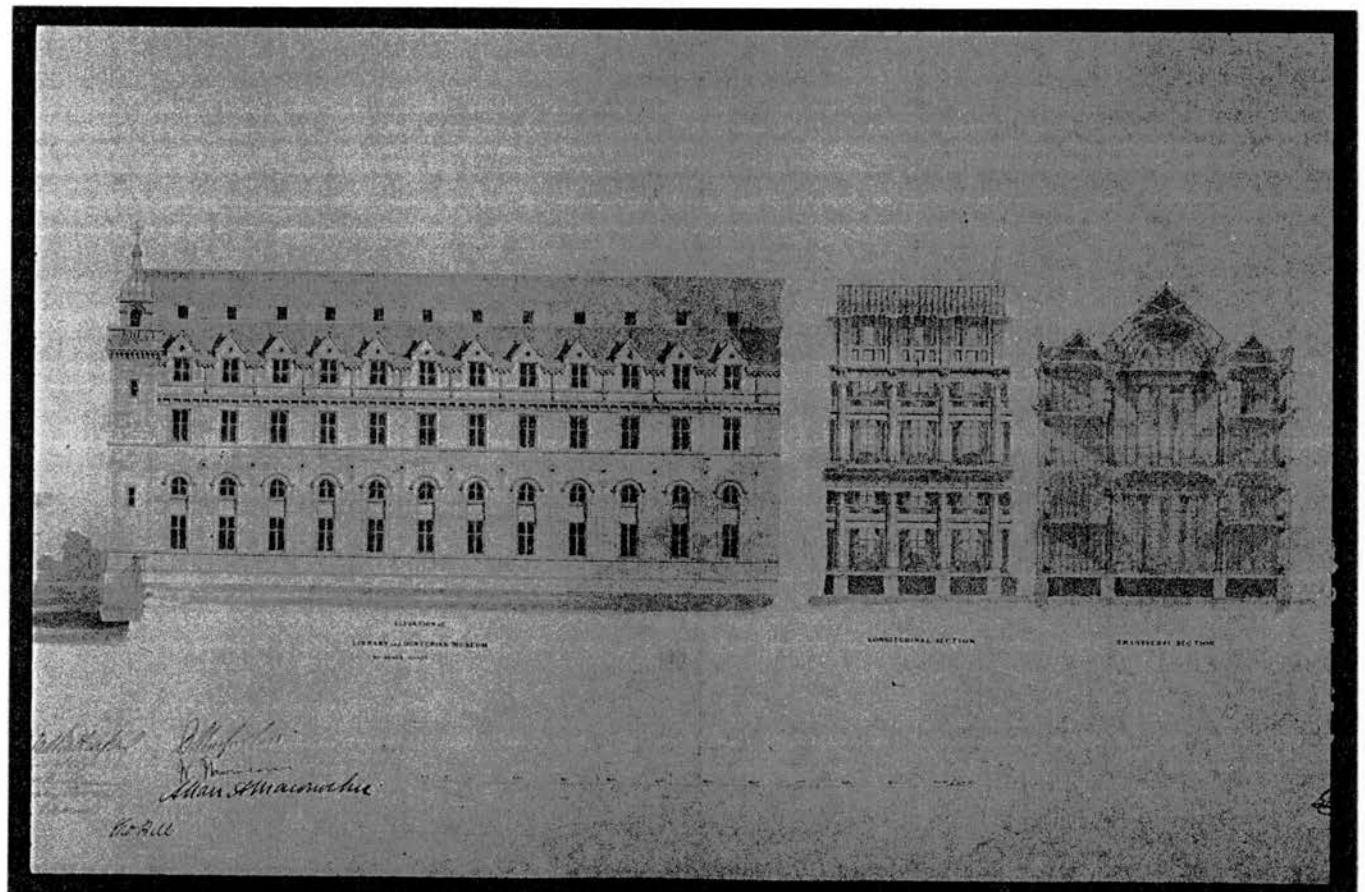


Fig. 48

Hunterian Museum, University of Glasgow

John Baird 1846

Elevation of the Hunterian Museum (first floor) and Library (ground floor). Longitudinal and transverse section through the Museum and Library.

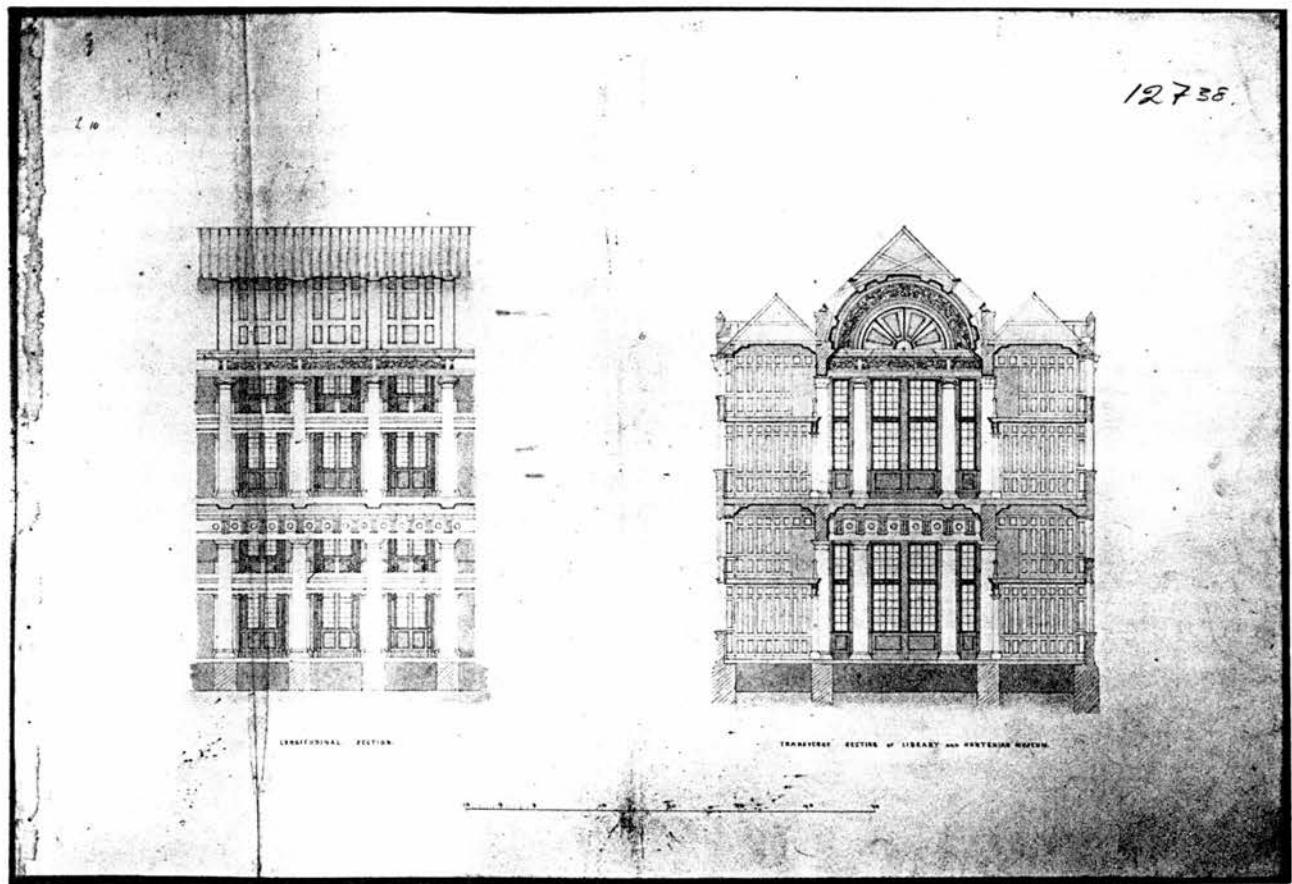


Fig. 49

Hunterian Museum, University of Glasgow

John Baird c.1846

Longitudinal and transverse sections through the Hunterian Museum
(first floor) and Library (ground floor).

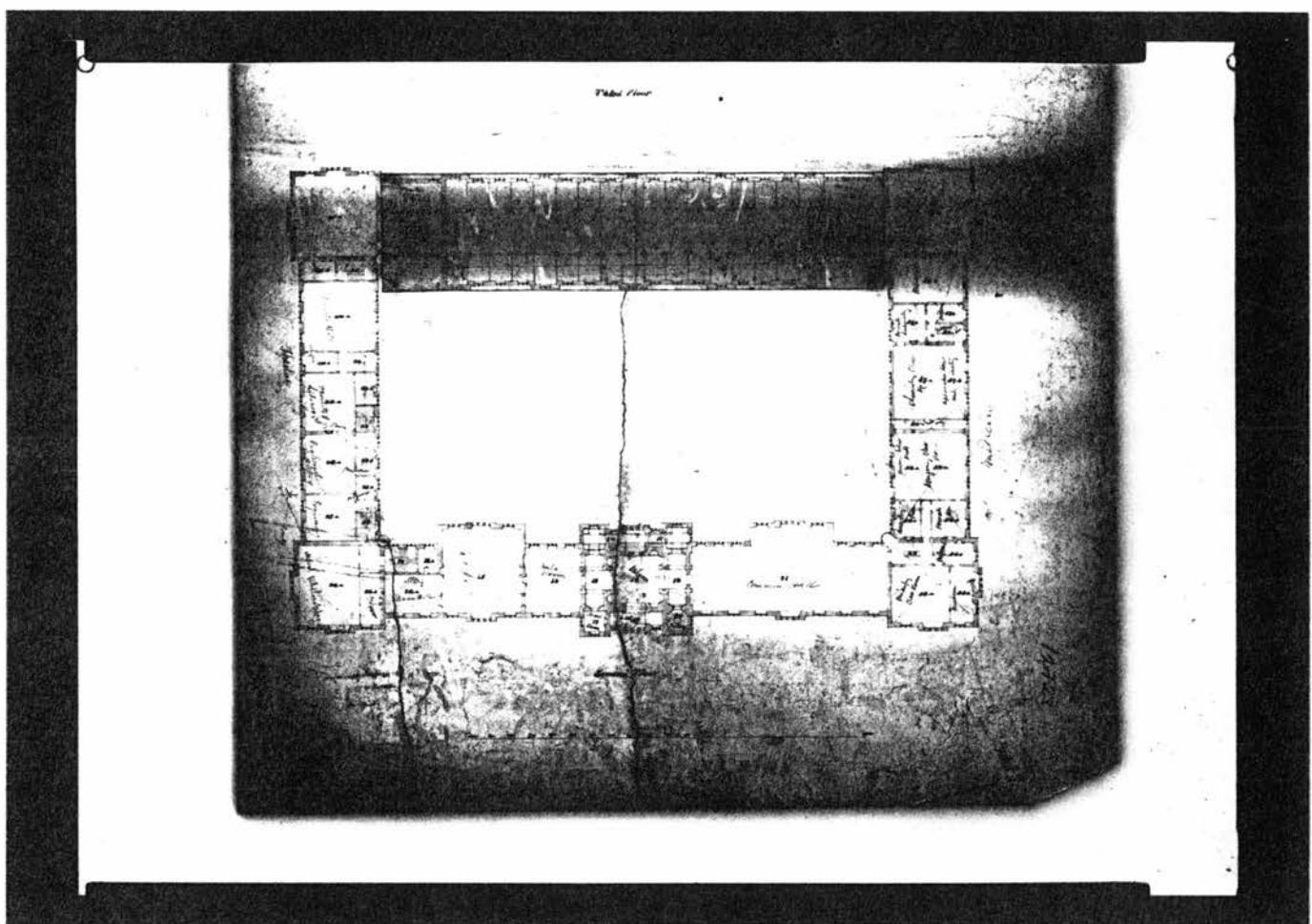


Fig. 50

University of Glasgow

John Baird 1847

Block plan of the second floor of the quadrangle. The museum is situated in the west wing (the shaded section).



3. ELEVATION BY EDWARD BLORE
FOR THE PROPOSED COLLEGE ON WOODLANDS HILL

Fig. 51
University of Glasgow
Edward Blore 1849
Drawing of the principal elevation.

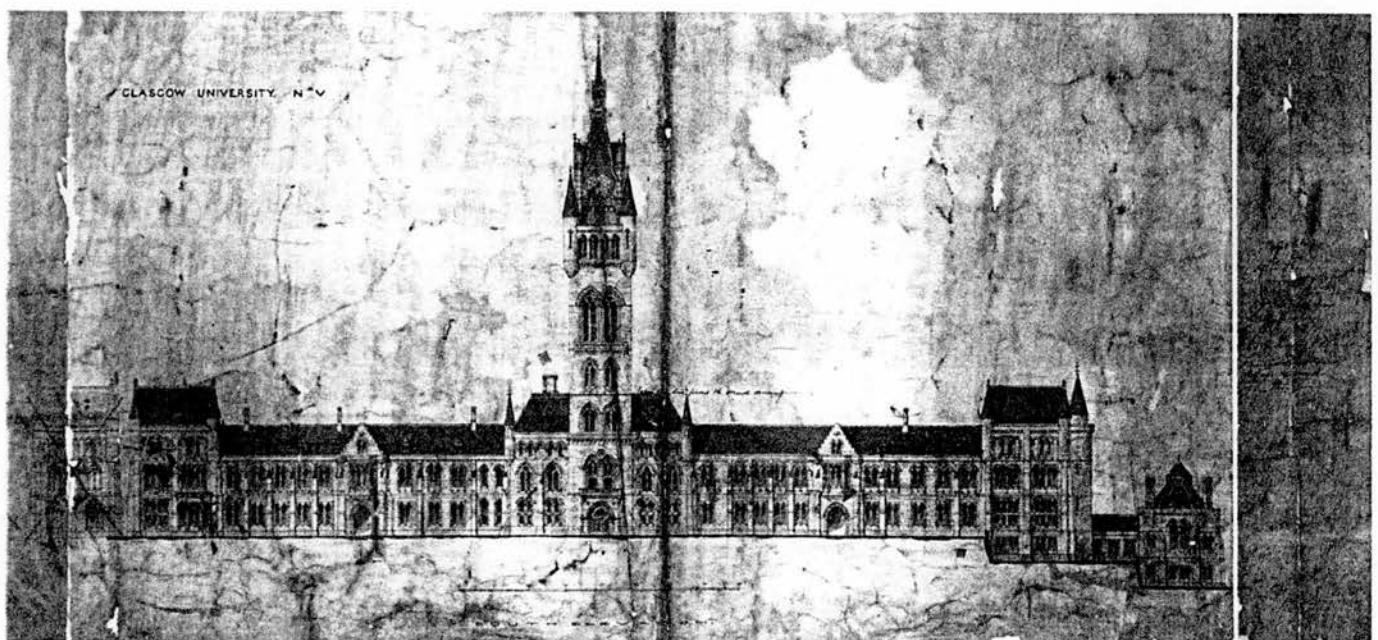


Fig. 52
University of Glasgow
George Gilbert Scott 1866
Drawing of the principal (south) elevation.

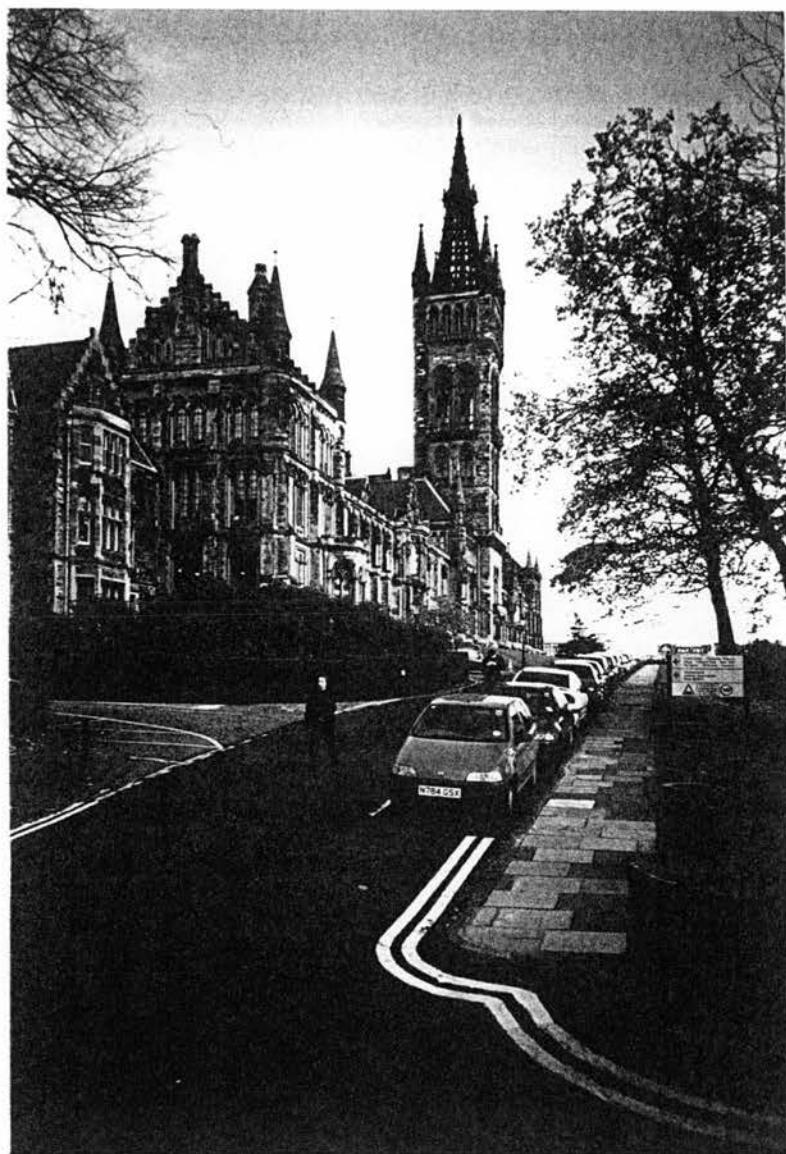


Fig. 53

University of Glasgow

George Gilbert Scott 1866

Photograph of the principal (south) elevation.

BLOCK PLAN OF THE NEW BUILDINGS.

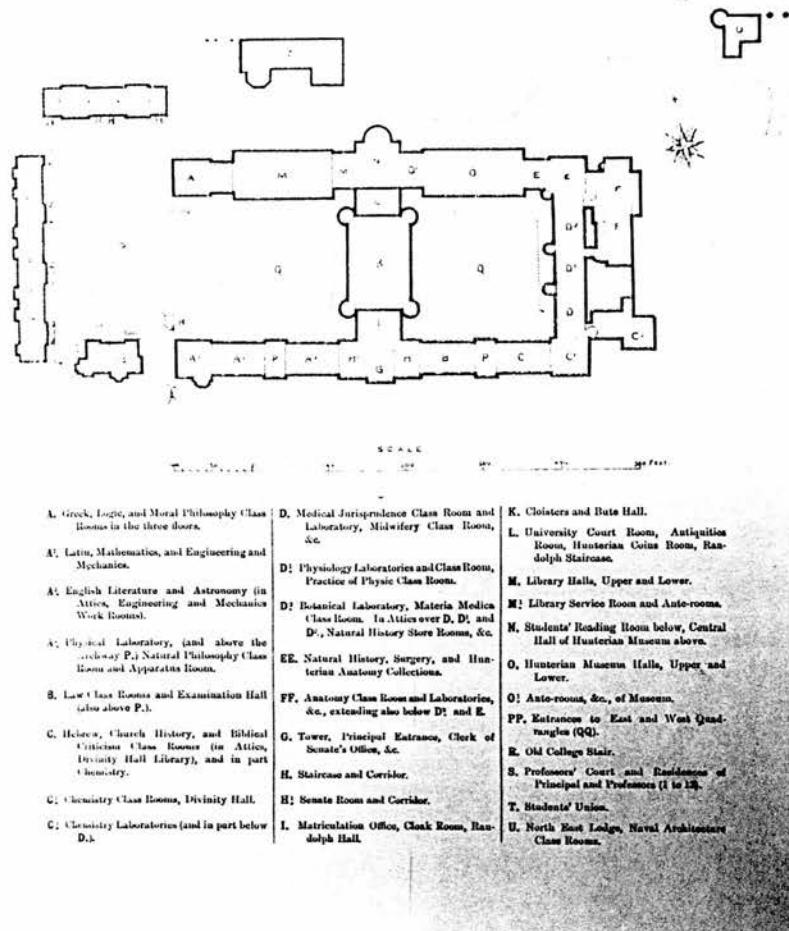


Fig. 55

New College, University of Glasgow

George Gilbert Scott 1866

Block plan of the college. New Hunterian (O) situated to the north of the east quadrangle.

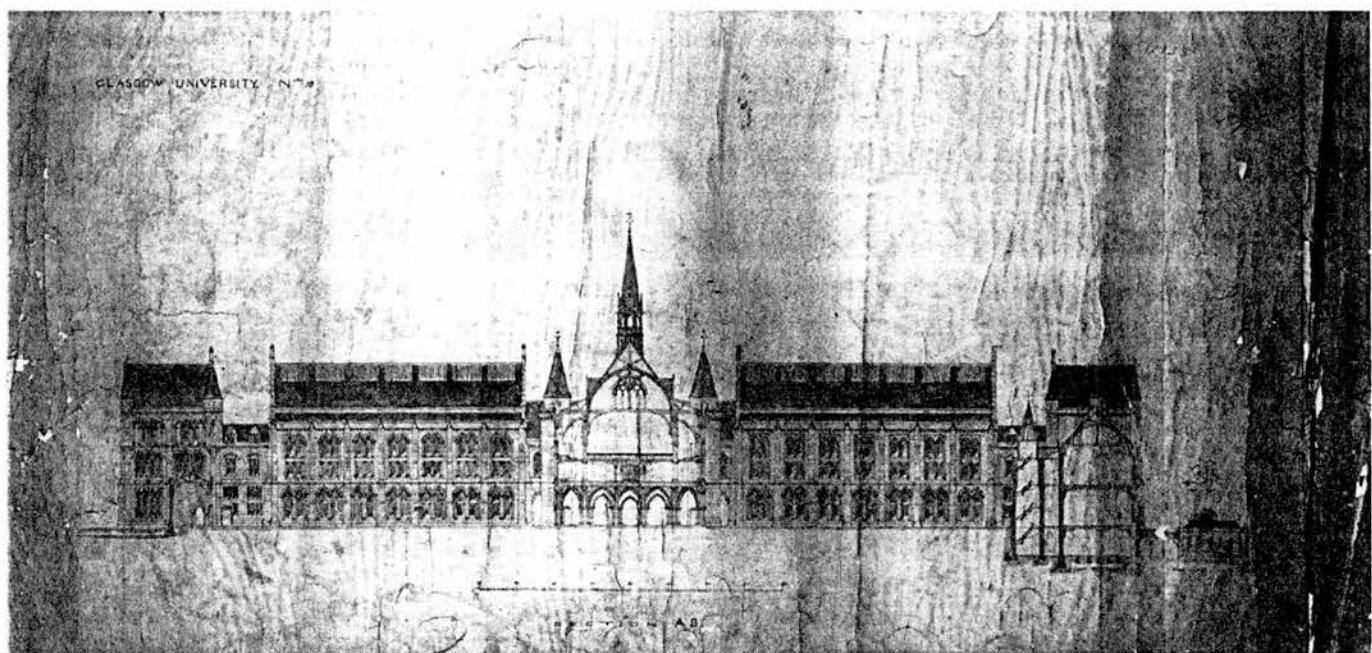


Fig. 55

University of Glasgow

George Gilbert Scott 1866

Drawing of the elevations of the north wing with a transverse section through the Bute Hall. To the east (right) is the Hunterian Museum, to the west (left) is the Library

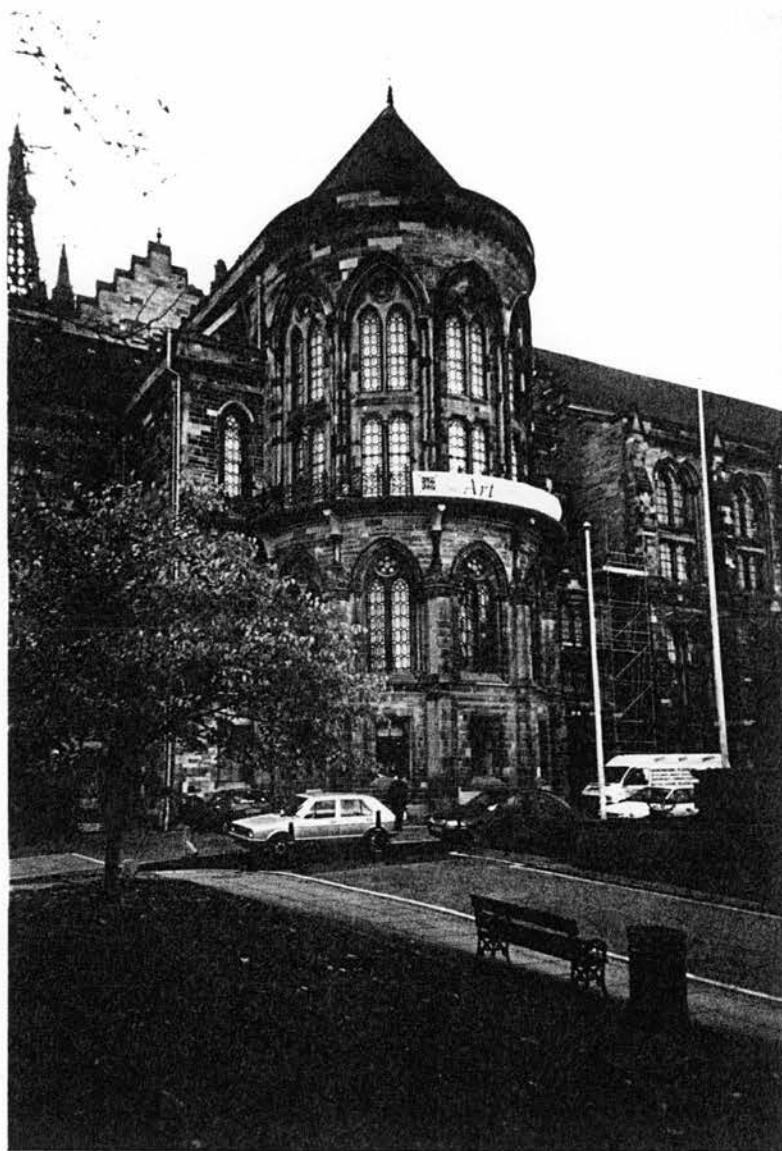


Fig. 56

Hunterian Museum, University of Glasgow

George Gilbert Scott 1866

Photograph of the north facade of the Hunterian Museum entrance hall.

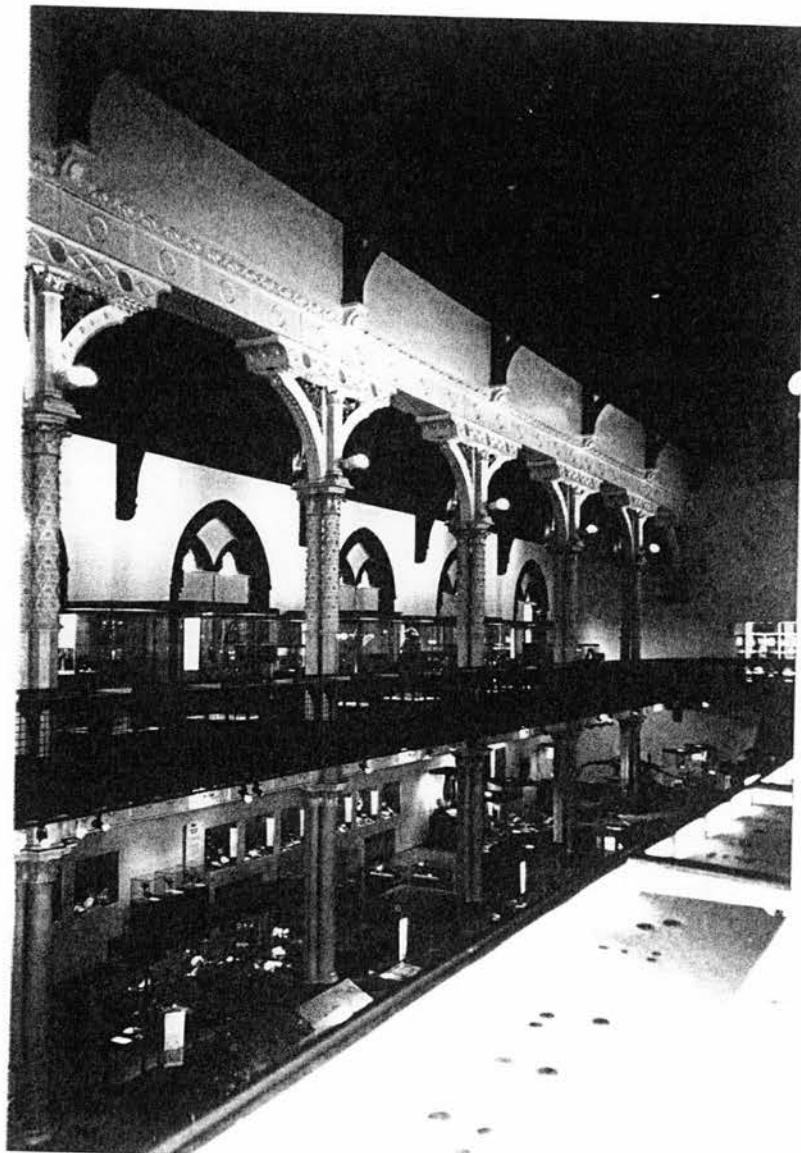


Fig. 57

Hunterian Museum, University of Glasgow

George Gilbert Scott 1866

Photograph of the interior of the Hunterian Museum from the mezzanine.

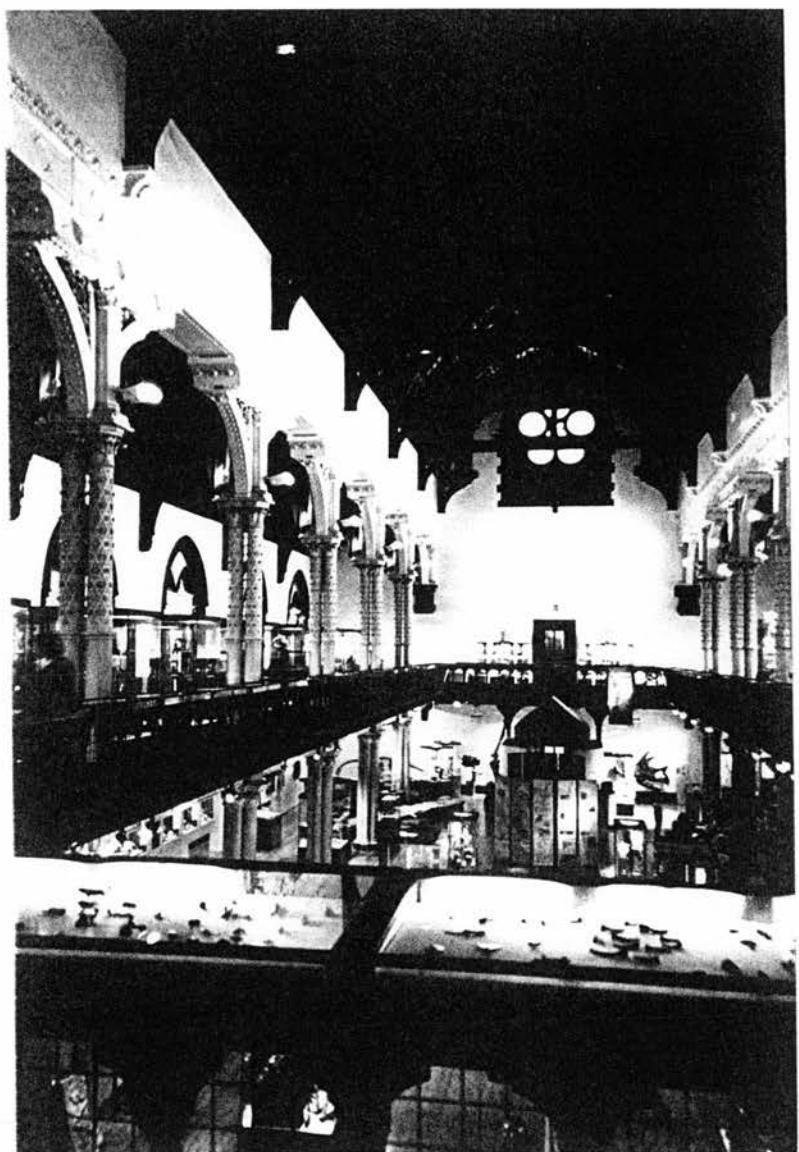


Fig. 58

University of Glasgow

George Gilbert Scott 1866

Photograph of the interior of the Hunterian Museum from the mezzanine.



Fig. 59

Hunterian Museum, University of Glasgow

George Gilbert Scott 1866

Photograph of the paired cylindrical supports of the roof at the gallery level.



Fig. 60

Museum of Anderson's University, Glasgow

Robert Scott and James Watt 1830

Interior of the museum. Watercolour by John Alexander Gilfillan.

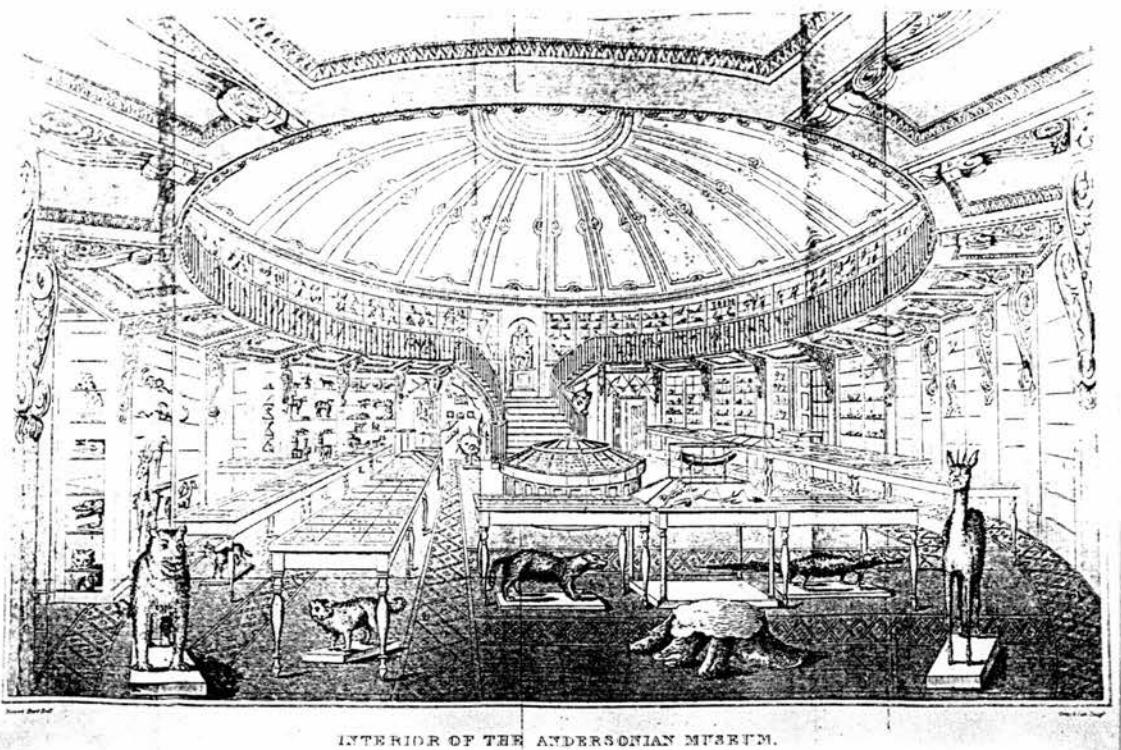


Fig. 61

Museum of Anderson's University, Glasgow

Robert Scott and James Watt 1830

Interior of the museum. Engraving by Gray & Son after a painting by Robert Hart.



Fig. 62

Anatomy Department, University of Glasgow

John James Burnet and John Oldrid Scott 1900

Photograph of the north facade of the department.

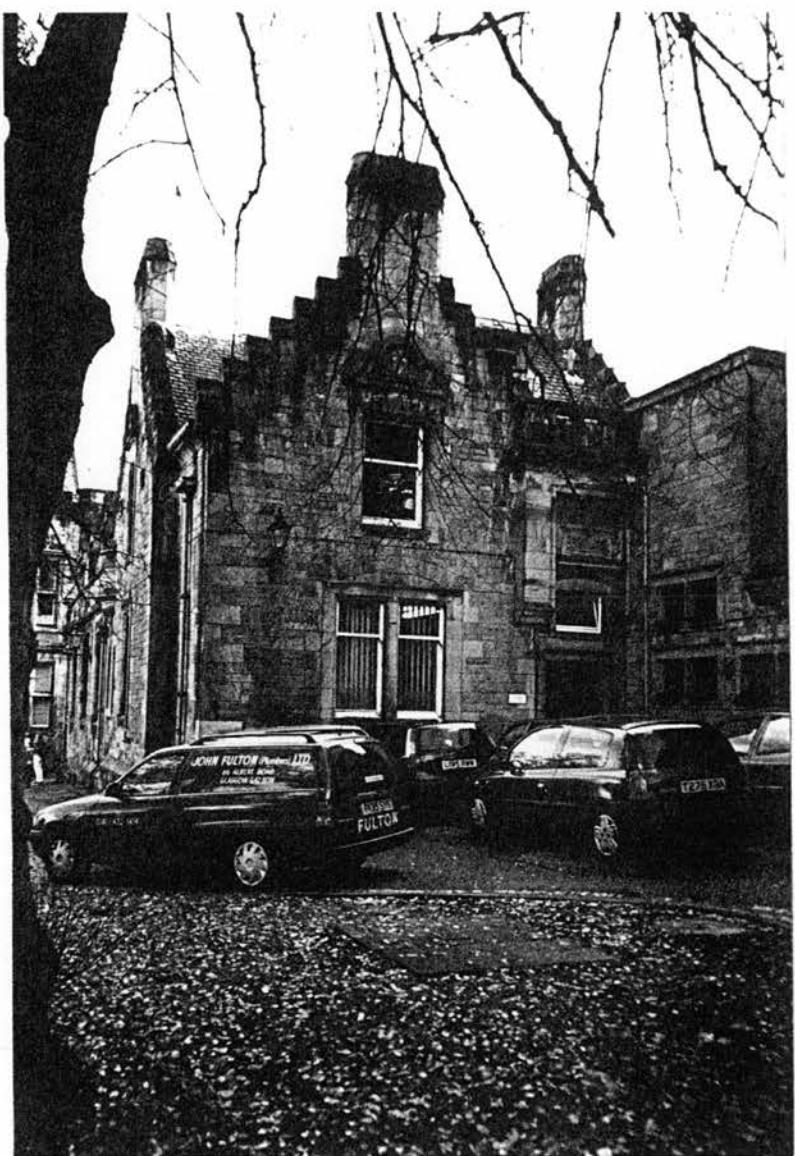


Fig. 63

Anatomy Department, University of Glasgow
John James Burnet and John Oldrid Scott 1900
Photograph of the entrance to the department.

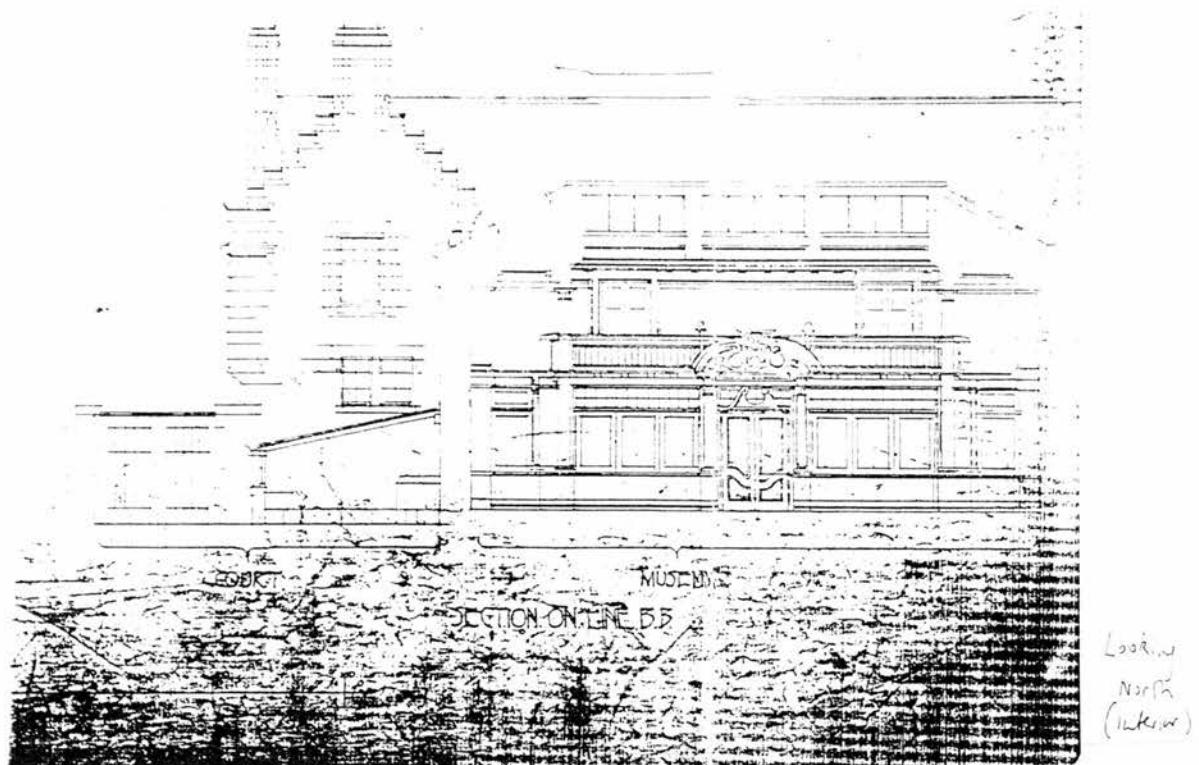


Fig. 64

Anatomy Museum, Anatomy Department, University of Glasgow
John James Burnet and John Oldrid Scott 1866
Transverse section through the museum (looking north).

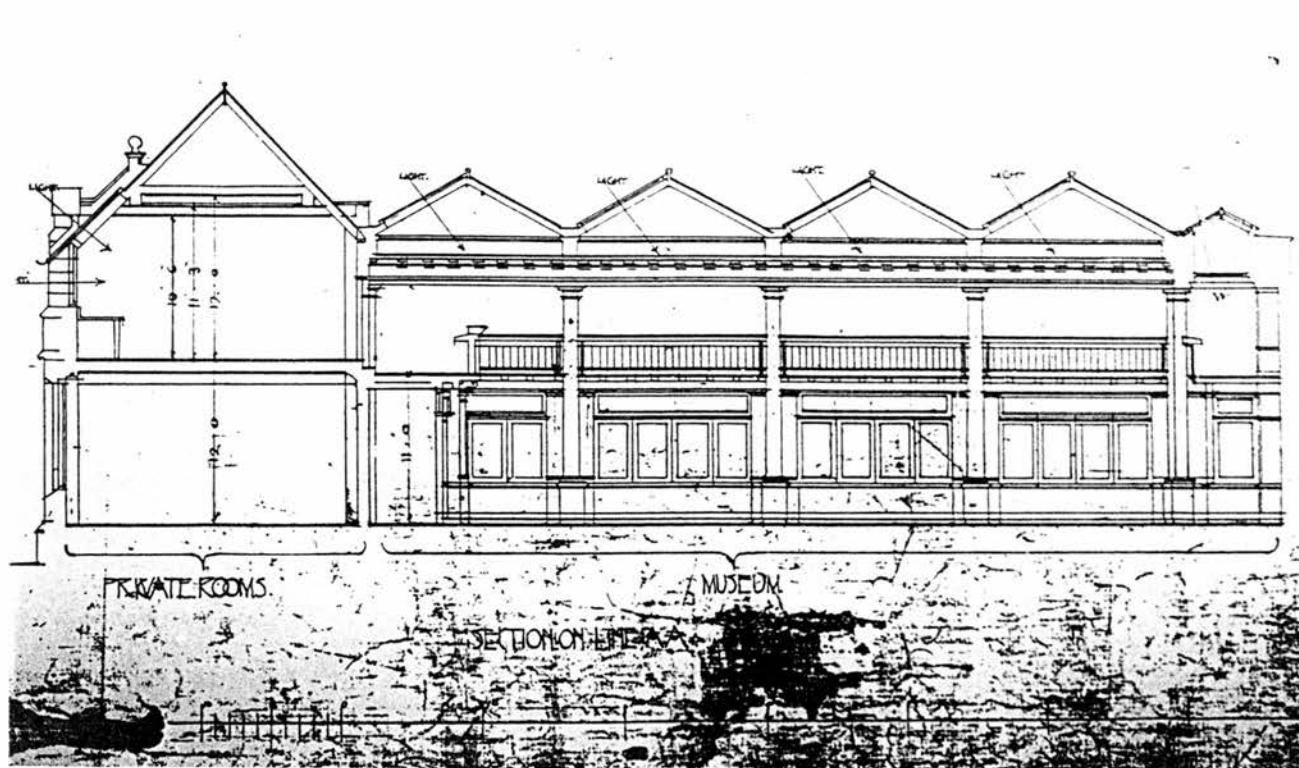


Fig. 65

Anatomy Museum, Anatomy Department, University of Glasgow

John James Burnet and John Oldrid Scott 1866

Longitudinal section through the museum (looking east).

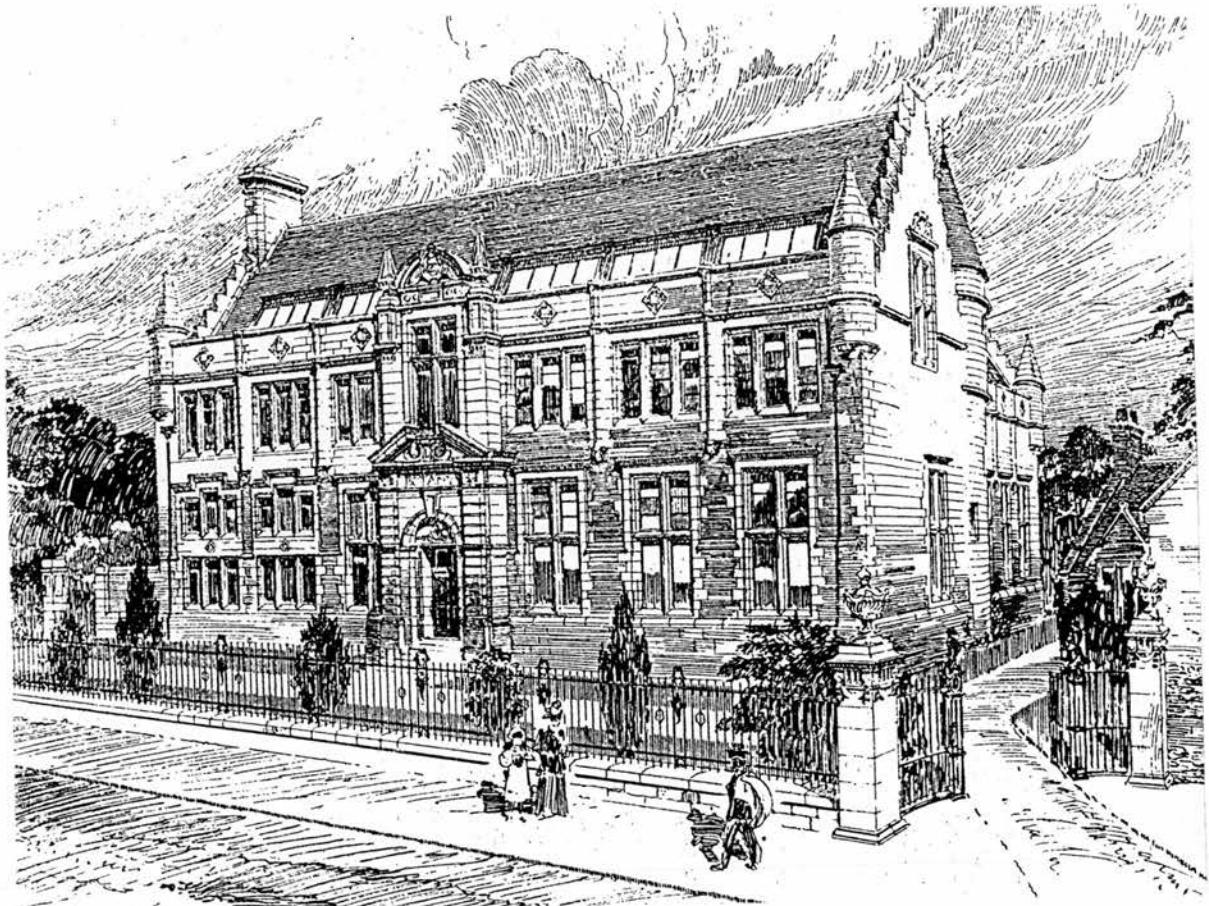


Fig. 66

Botany Department, University of Glasgow
John James Burnet and John Oldrid Scott 1911
Drawing of the principal (north) facade.



Fig. 67
Botany Department, University of Glasgow
John James Burnet and John Oldrid Scott 1911
Photograph of the principal (north) facade. The herbarium was situated on the ground floor of the right of the central pavilion.

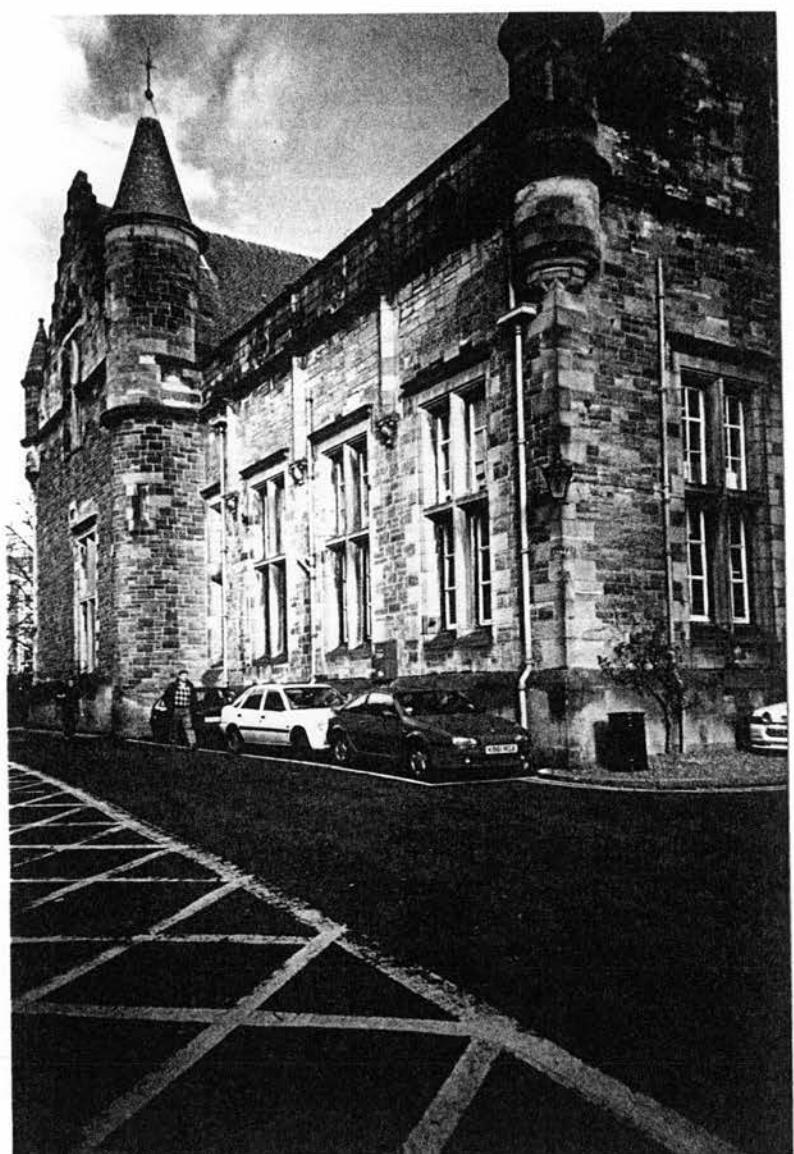


Fig. 68

Botany Department, University of Glasgow

John James Burnet and John Oldrid Scott 1911

Photograph of the west facade of the botany museum.

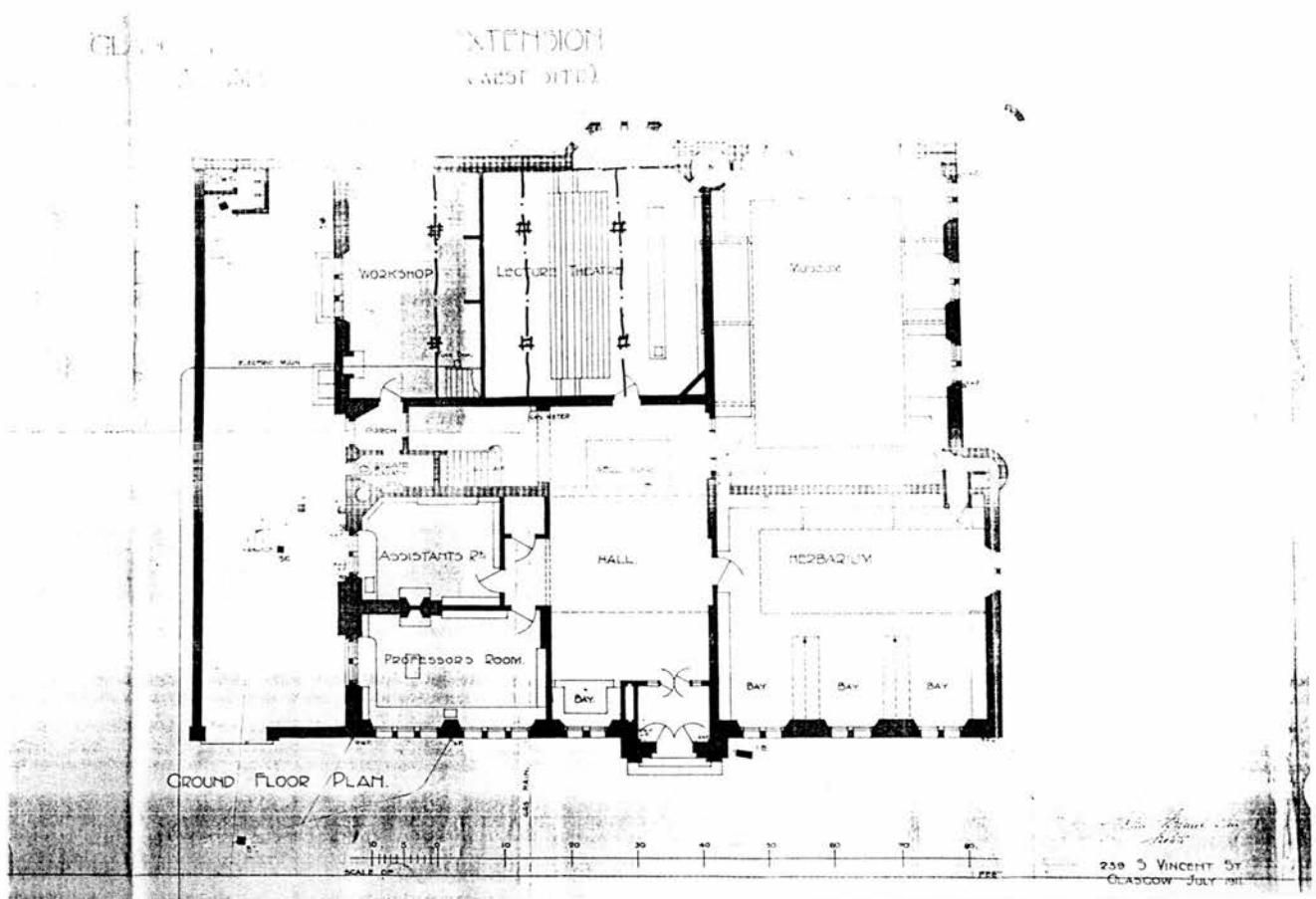
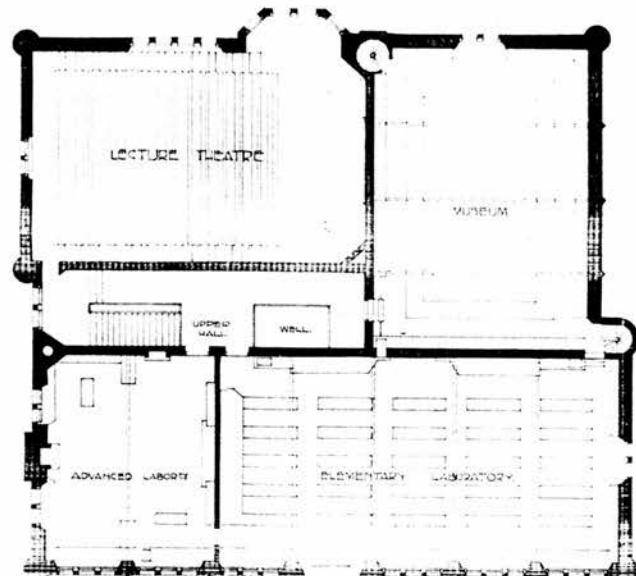


Fig. 69

Department of Botany, University of Glasgow
John James Burnet and John Oldrid Scott 1911
Plan of the ground floor.

CLASGOW UNIVERSITY EXTENSION
BOTANICAL BUILDINGS (WEST SITE)



PLAN FIRST FLOOR

Fig. 70

Department of Botany, University of Glasgow

John James Burnet and John Oldrid Scott 1911

Plan of the first floor.

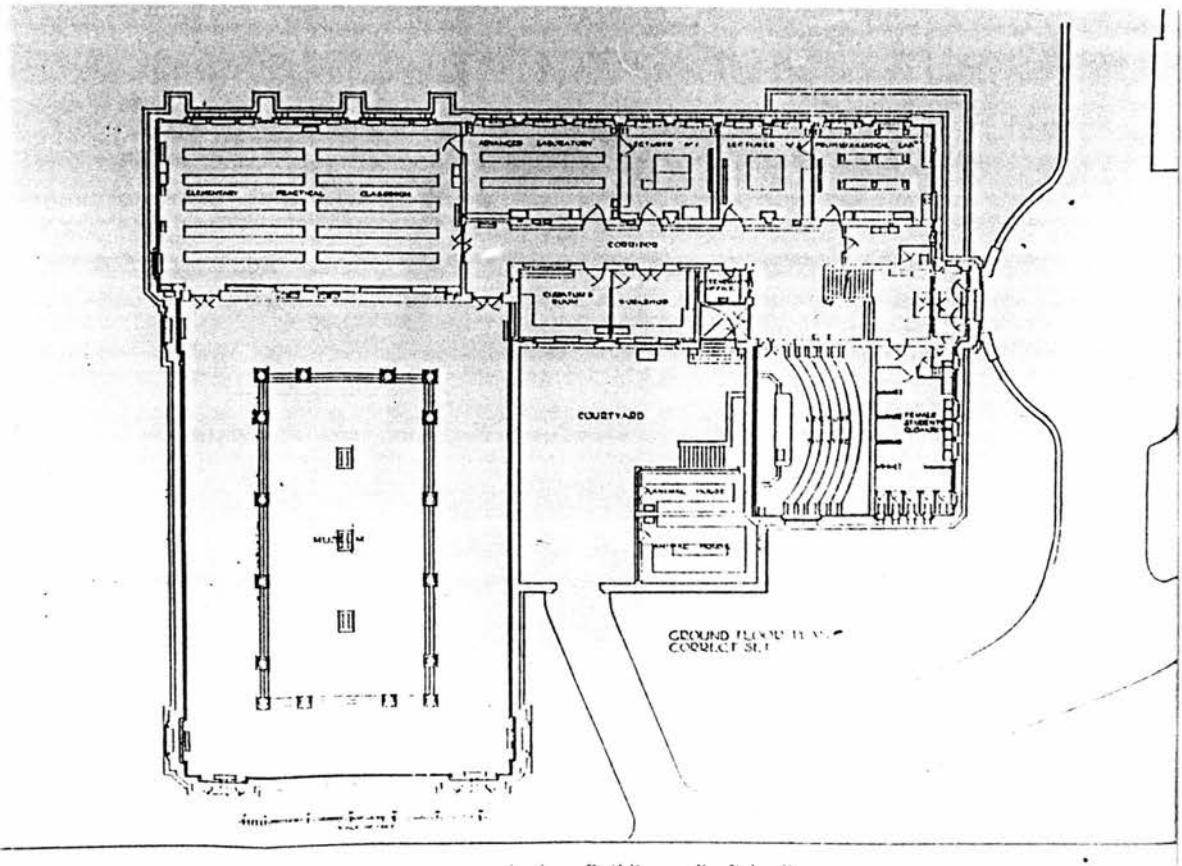


Fig. 71

Zoology Department, Graham Kerr Building, University of Glasgow

John James Burnet 1921

Plan of the ground floor.

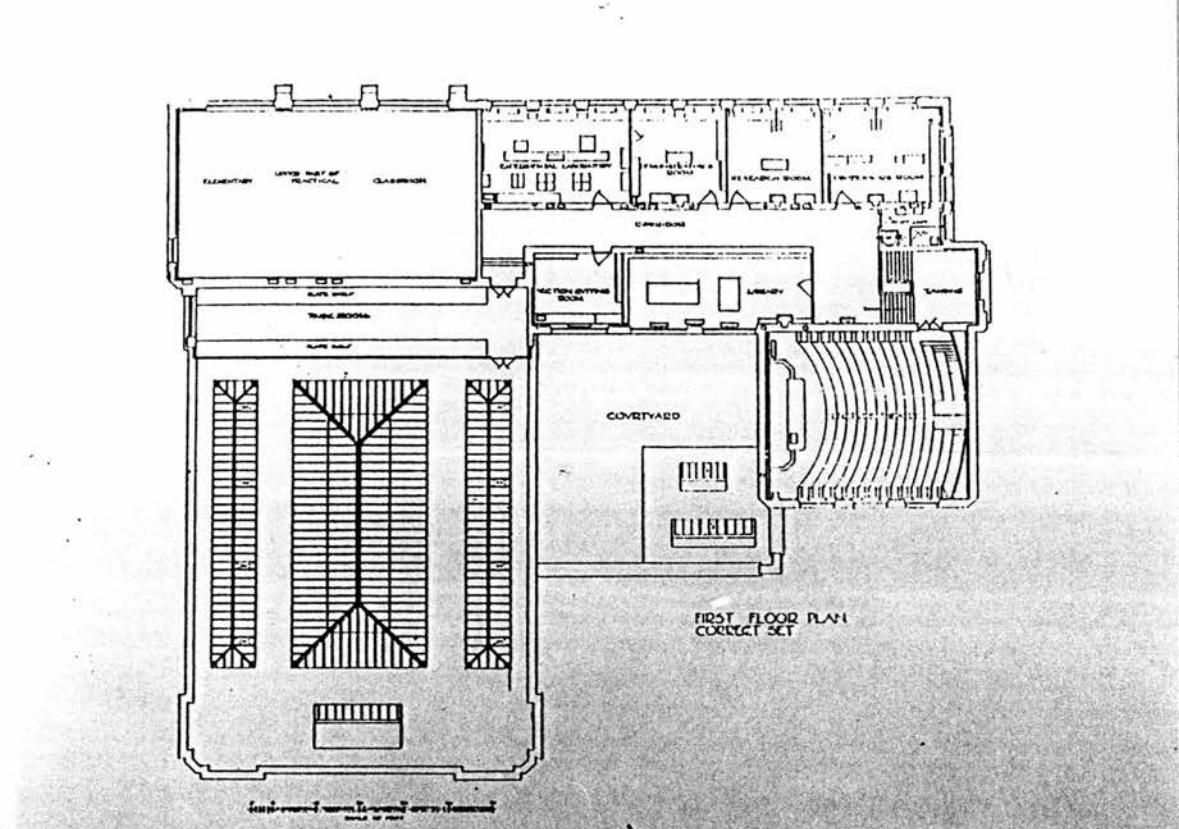


Fig. 72

Zoology Department, Graham Kerr Building, University of Glasgow
John James Burnet 1921

First floor plan. Showing the roof lights of the museum.

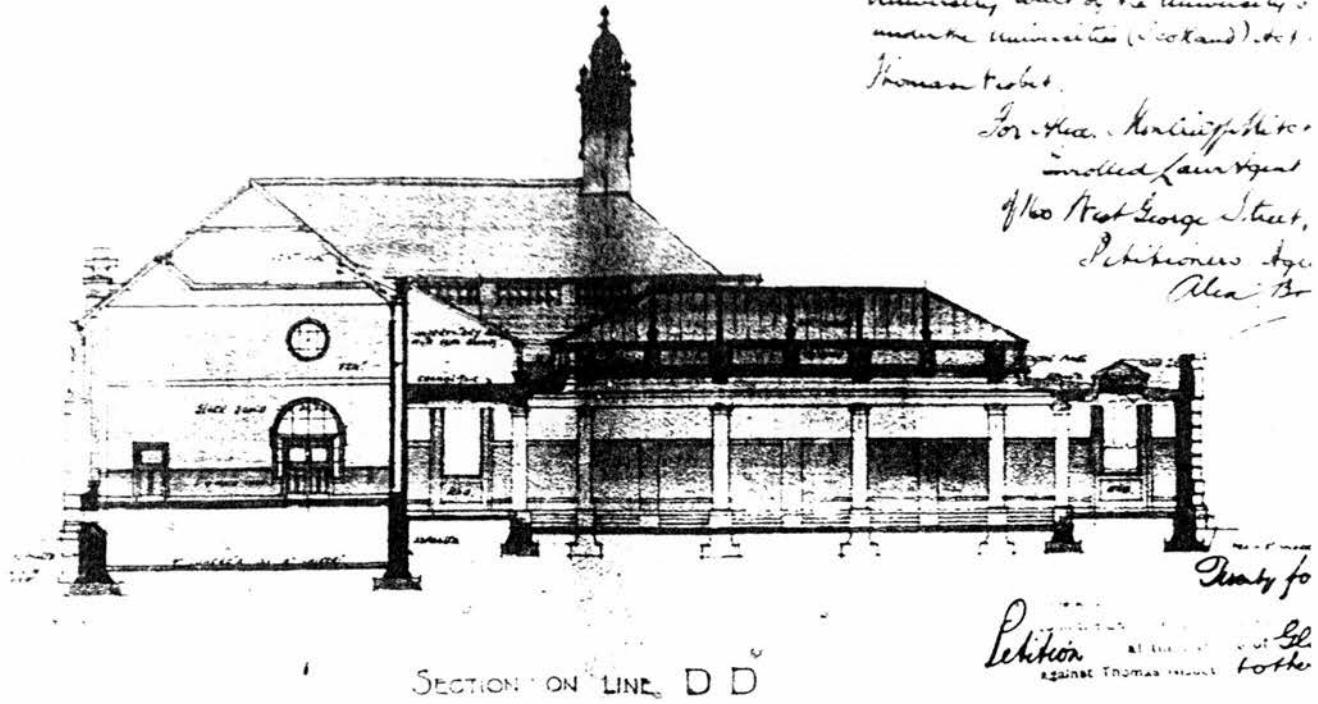


Fig. 73

Zoology Department, Graham Kerr Building, University of Glasgow
John James Burnet 1921

Transverse section through the museum (looking north).

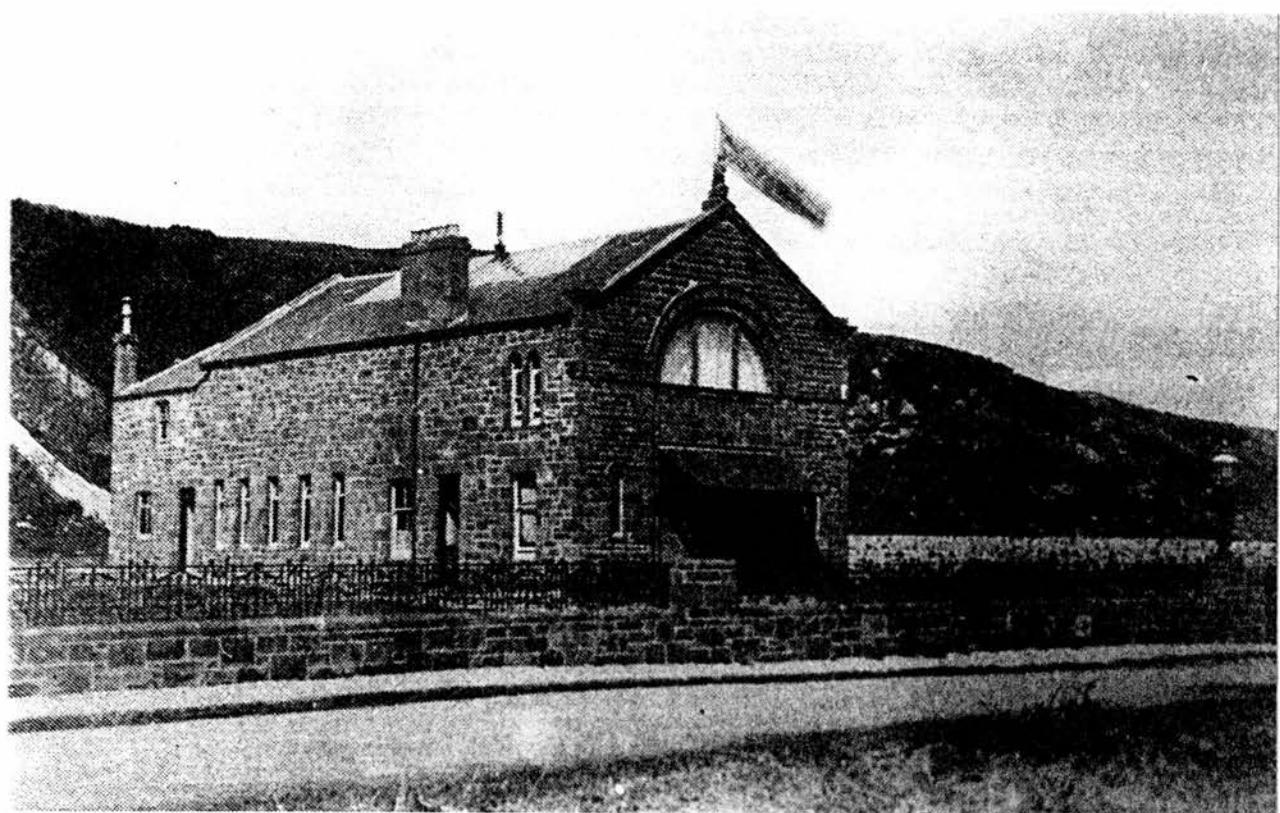


Fig. 74

University Marine Biological Station, Millport Haven, Isle of Cumbrae

Architect unknown 1896

Photograph of the front elevation.

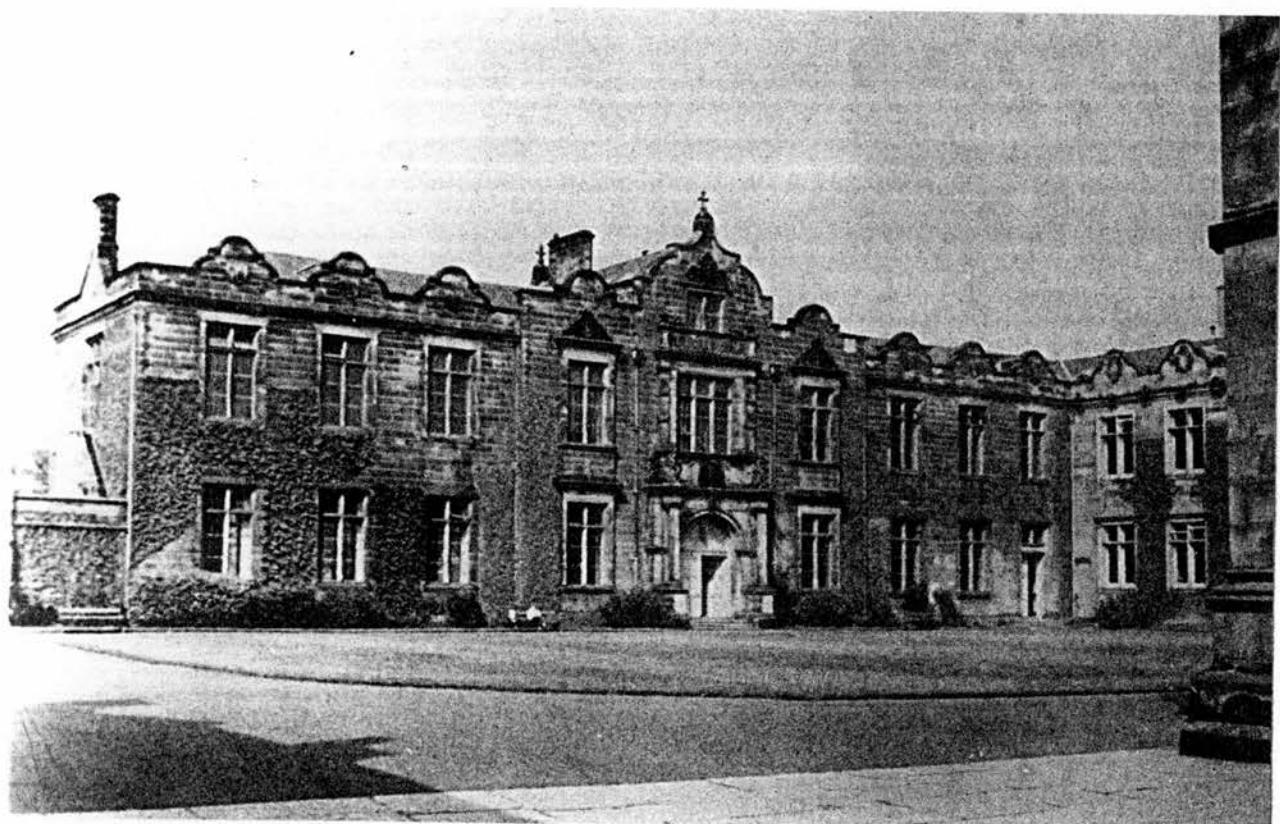


Fig. 75

United College (north range), University of St. Andrews

William Nixon 1849

Photograph of William Nixon's north range.

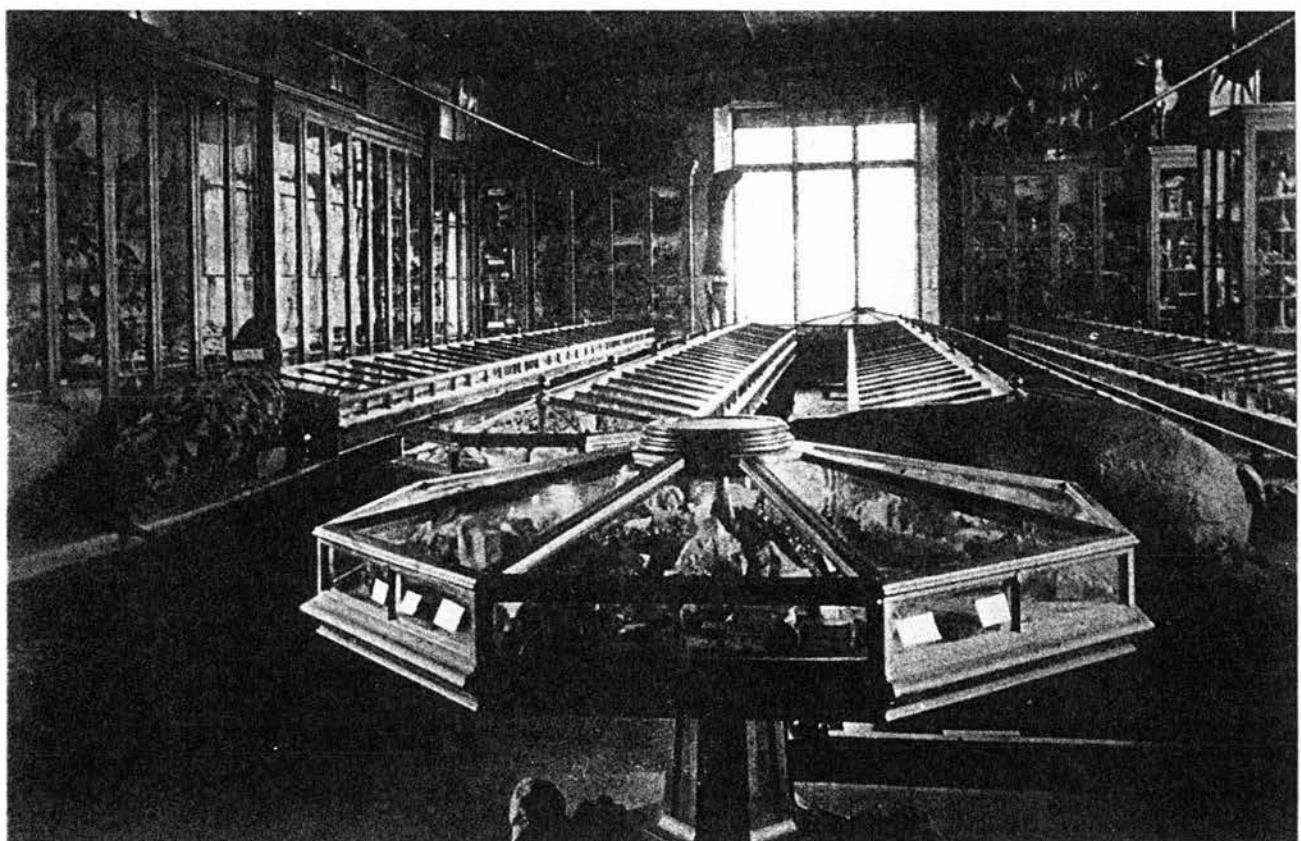


Fig. 76

Natural History Museum, United College, University of St. Andrews
William Nixon 1849

Photograph of the interior of the museum (looking west).

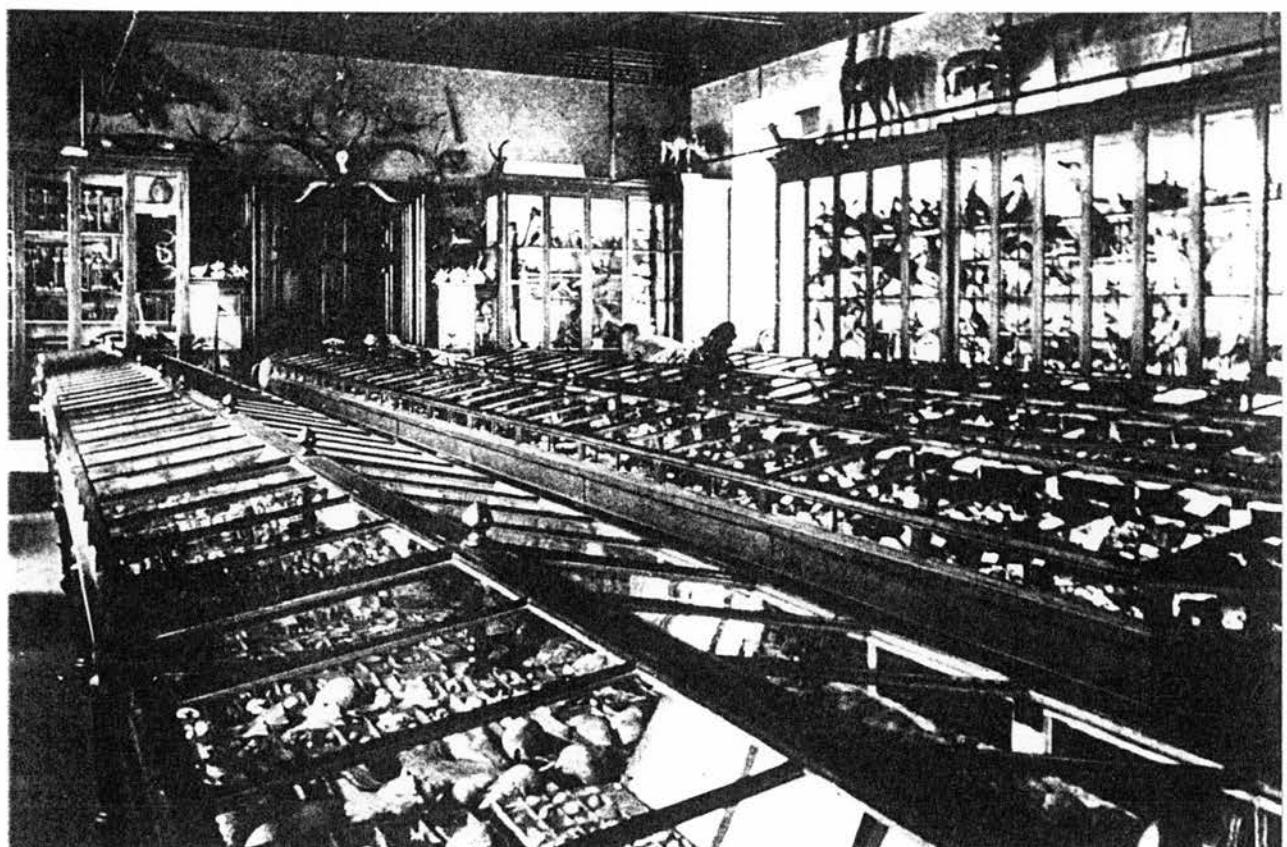


Fig. 77

Natural History Museum, United College, University of St. Andrews
William Nixon 1849

Photograph of the interior of the museum (looking east).

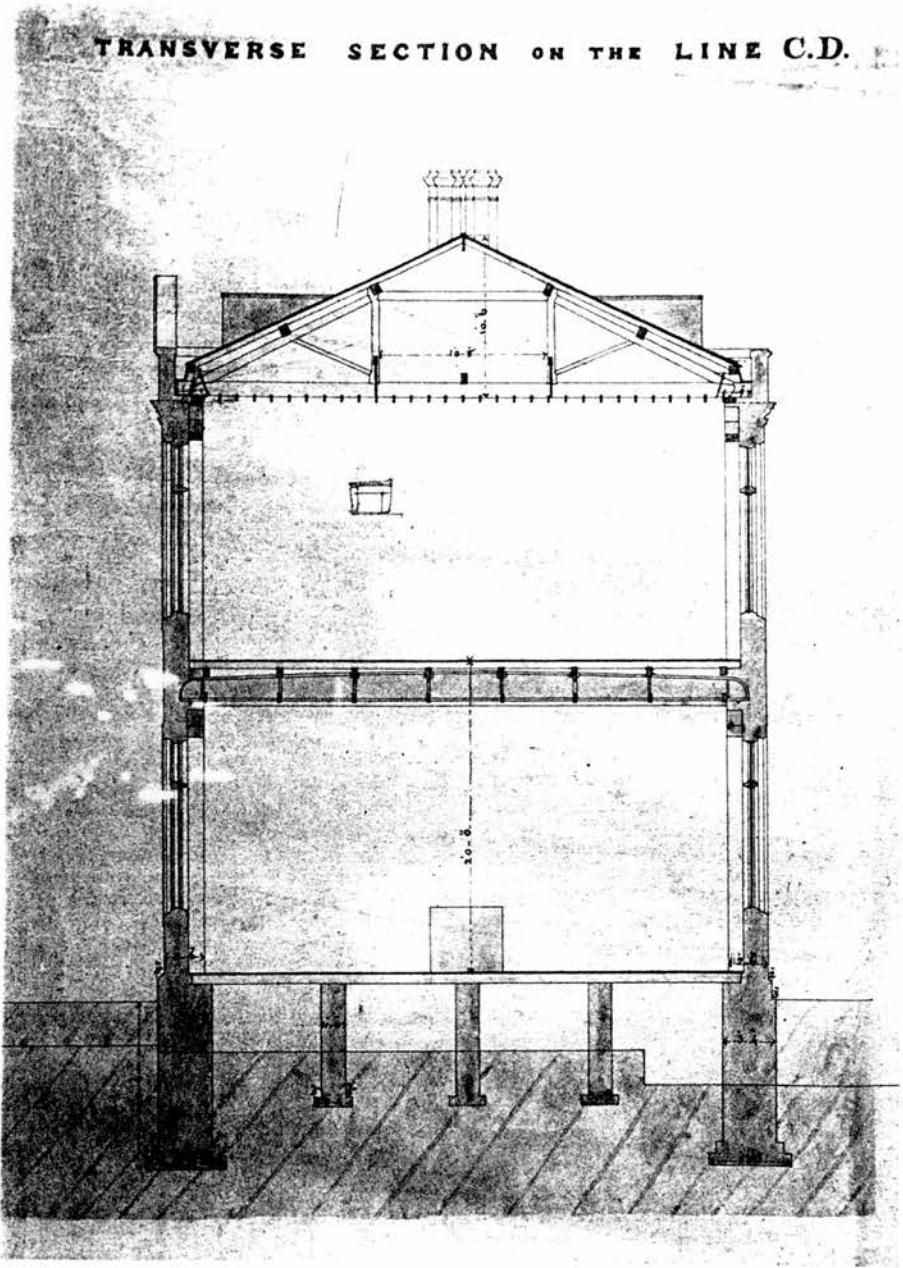


Fig. 78

Natural History Museum, United College, University of St. Andrews
William Nixon 1849

Transverse section through the north range. Museum on the first
floor.

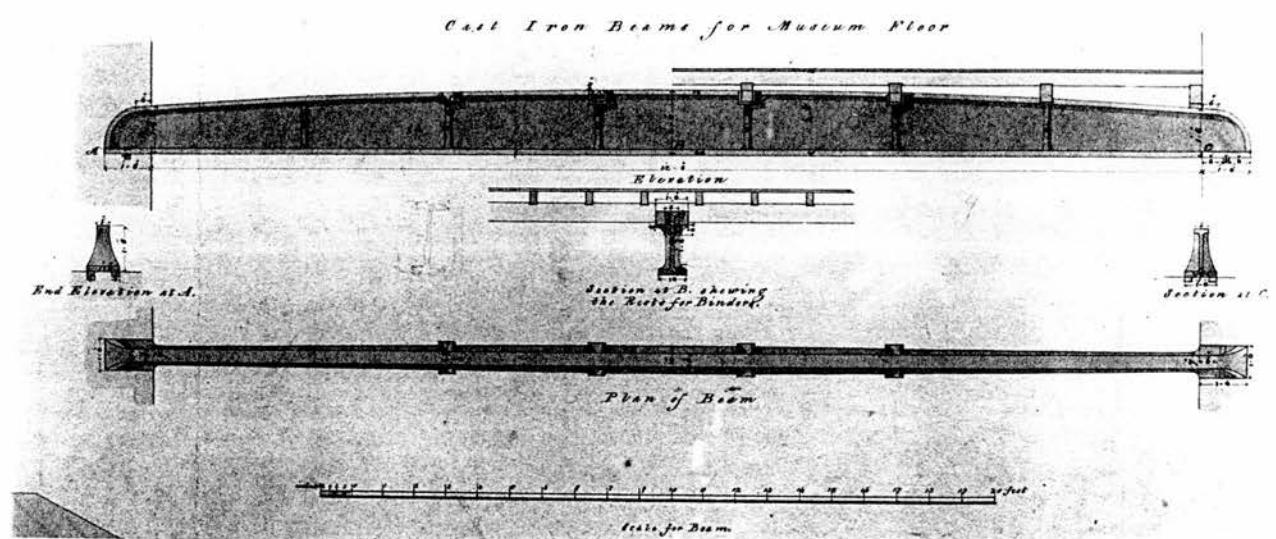


Fig. 79

Fish-belly beams, Natural History Museum, United College,

University of St. Andrews

William Nixon 1849

Plan of fish-belly beams for the Natural History Museum.

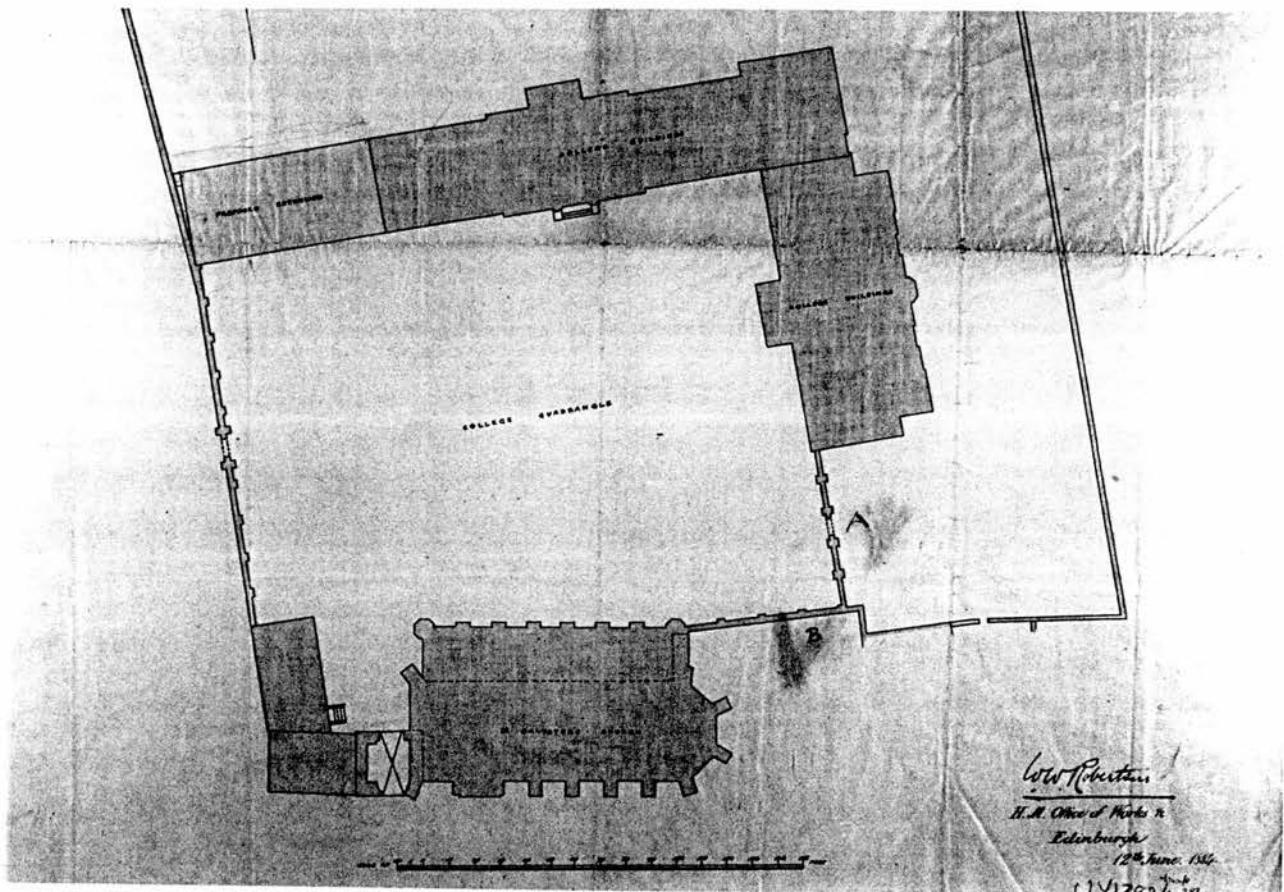


Fig. 80

United College, University of St. Andrews

W. W. Robertson 1884

Block plan of United College showing the proposed extension to the north range (unexecuted).

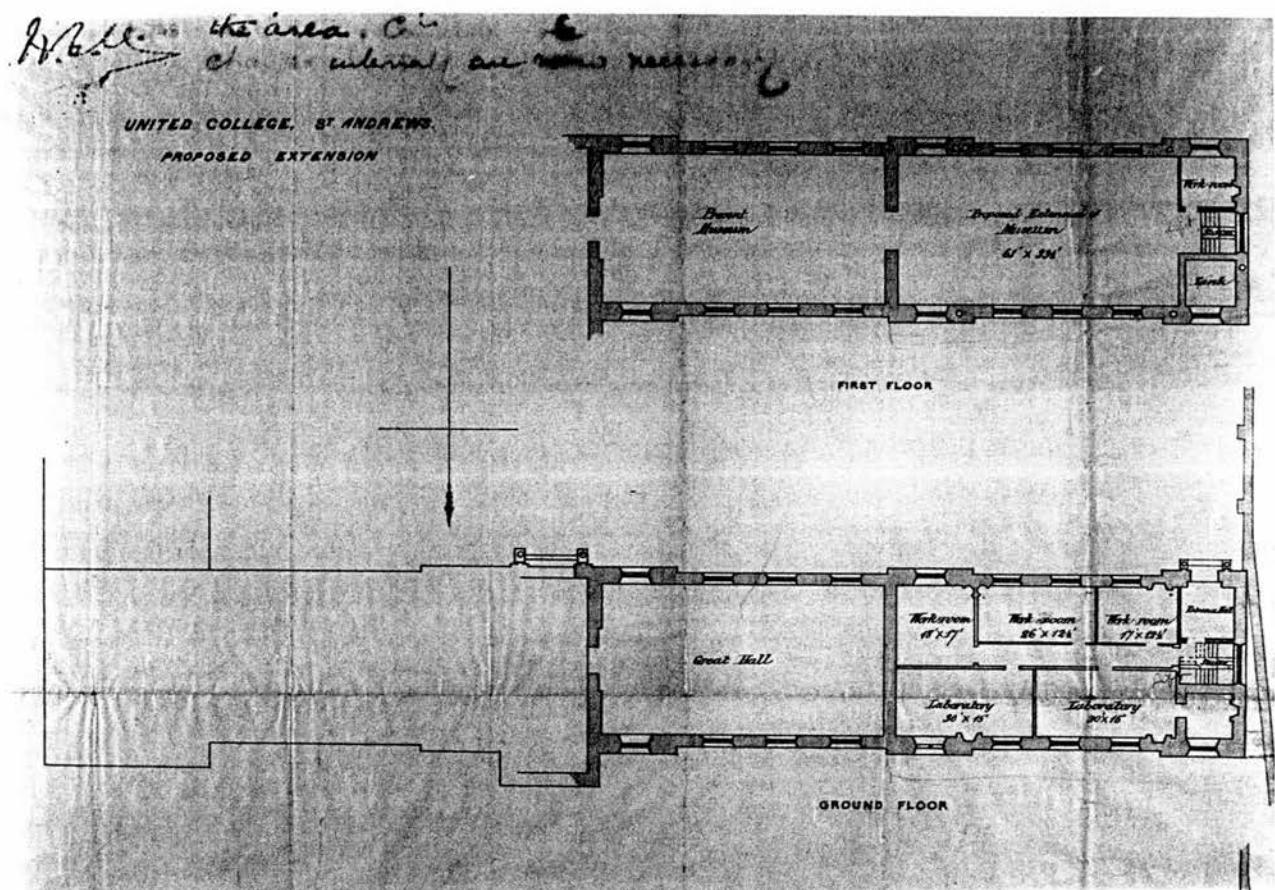


Fig. 81

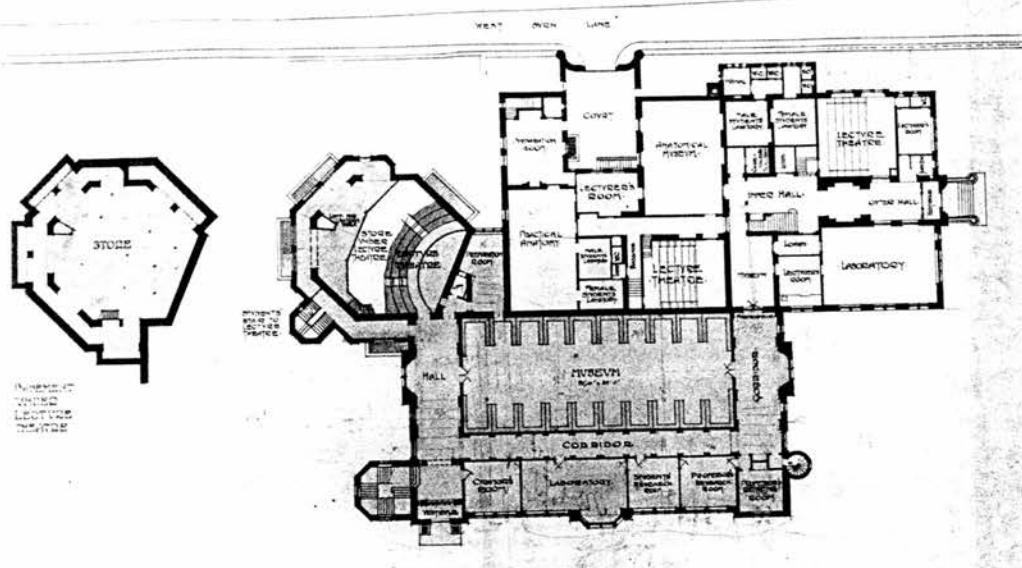
United College, University of St. Andrews

W. W. Robertson 1884

Plan of the proposed extension to the Natural History Museum.

Ground floor (bottom), first floor (top). This plan is up sidedown.

UNIVERSITY OF ST. ANDREWS
BELL PETTIGREW MUSEUM LABORATORY & LECTURE THEATRE
at THE MEDICAL SCHOOL OF ST. ANDREWS



GROUNDS FLOOR PLAN

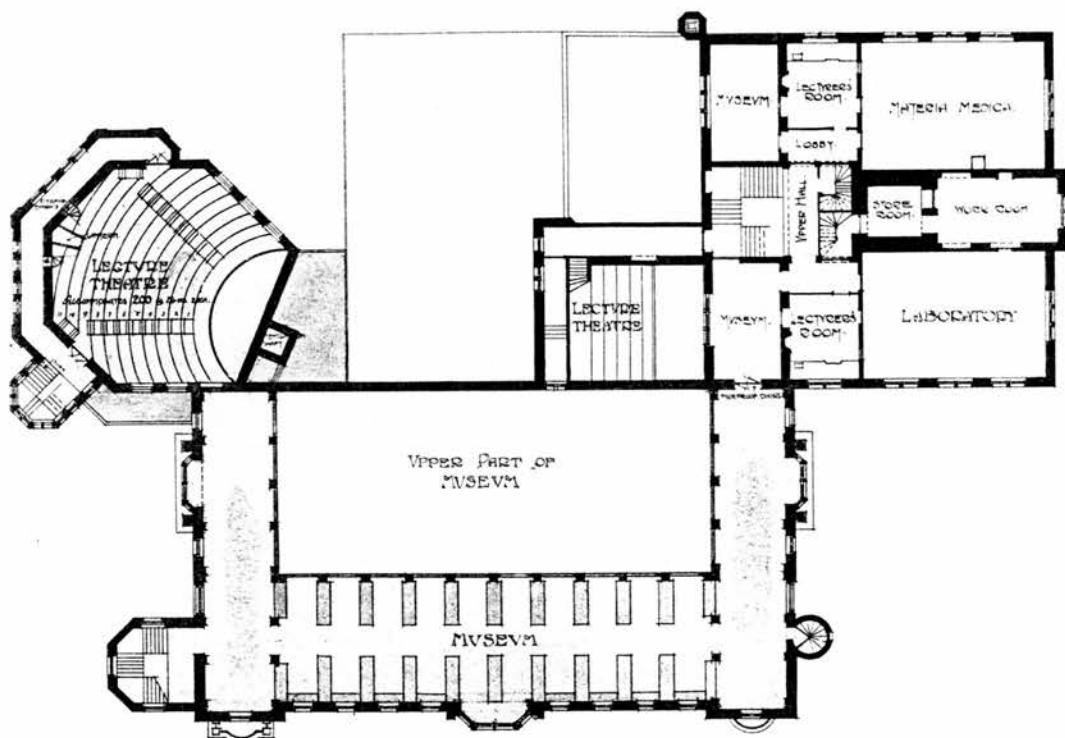
1140/1

Scale: 1 inch = 50 feet

4 QUEEN STREET,
EDINBURGH, W.C. 1908

Fig. 82

Bell Pettigrew Museum, University of St. Andrews
James Gillespie and James Scott 1908
Plan of the ground floor.



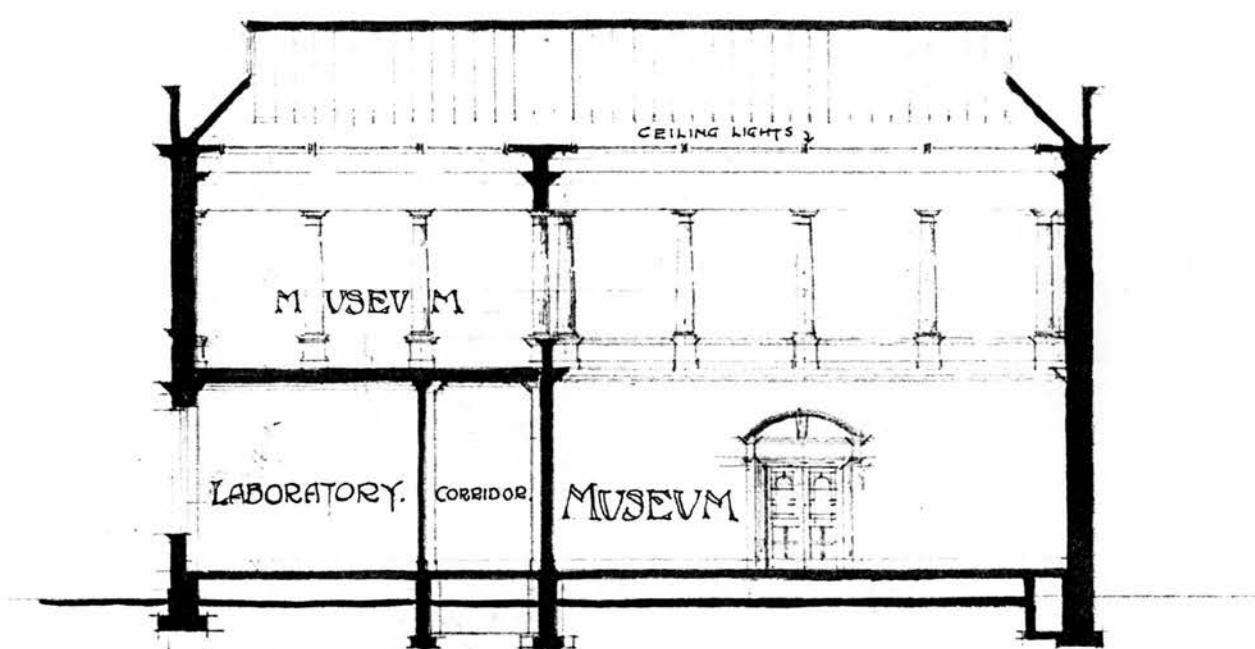
FIRST FLOOR PLAN

Fig. 83

Bell Pettigrew Museum, University of St. Andrews

James Gillespie and James Scott 1908

Plan of the first floor.



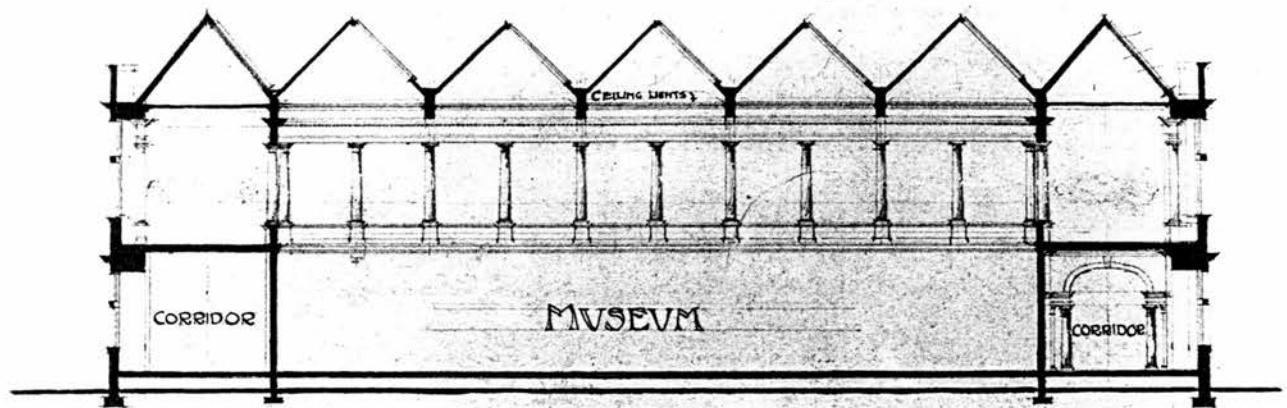
CROSS SECTION.

Fig. 84

Bell Pettigrew Museum, University of St. Andrews

James Gillespie and James Scott 1908

Transverse section through the museum.



LONGITUDINAL SECTION

Fig. 85

Bell Pettigrew Museum, University of St. Andrews

James Gillespie and James Scott 1908

Longitudinal section through the museum.

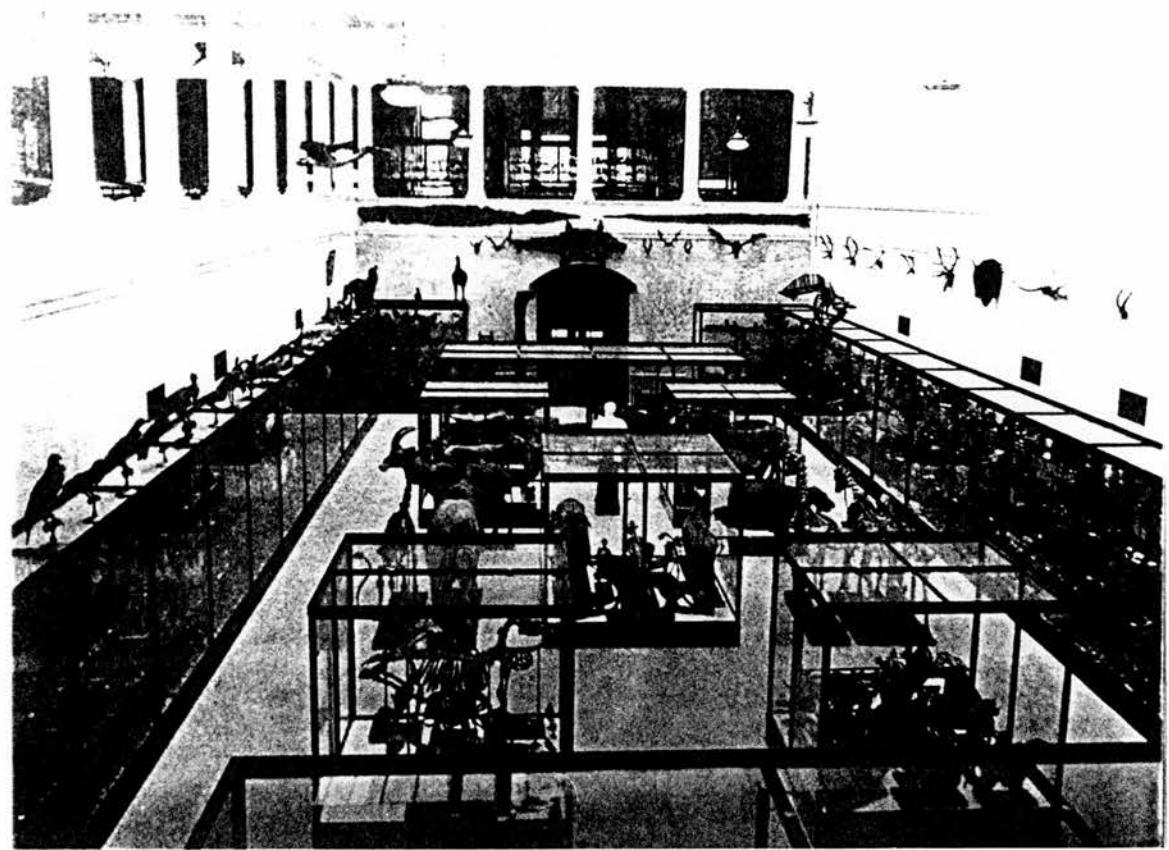


Fig. 86

Bell Pettigrew Museum, University of St. Andrews

James Gillespie and James Scott 1908

Photograph of the interior of the museum from the gallery
(looking north).

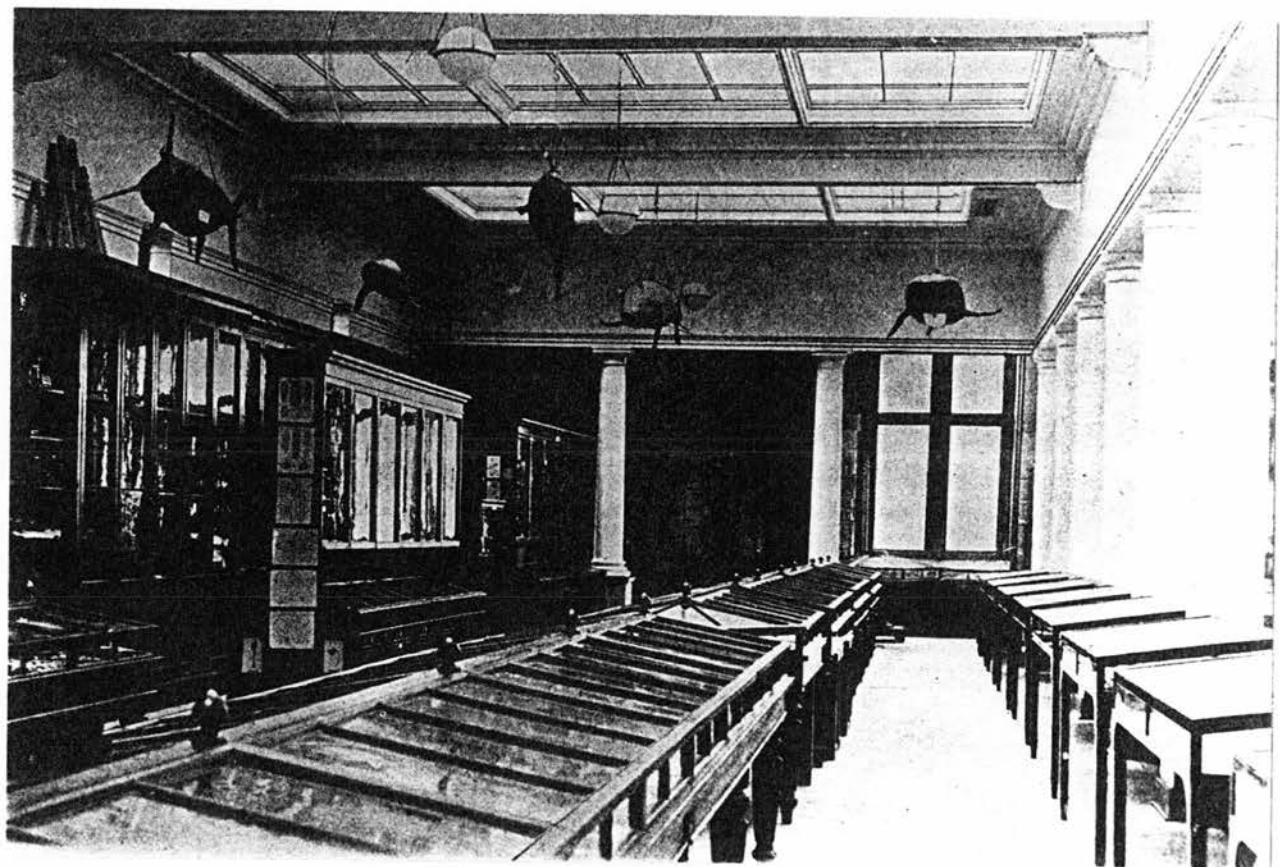


Fig. 87

Bell Pettigrew Museum, University of St. Andrews

James Gillespie and James Scott 1908

Photograph of the west gallery of the museum looking north.



Fig. 88

Chemistry Museum, University of St. Andrews

James Gillespie and James Scott 1903

Photograph of the interior of the museum.



Fig. 89

University College, Dundee

Architect unknown

Photograph of the Victorian villas in which University College was originally housed.



Fig. 90

Zoology Department, University College, Dundee

John Murray Roberton 1892

Photograph of the front (south) elevation of University College, Dundee. The zoology department is second from right (with the ground floor glass house). The museum was situated on the first and second floors.

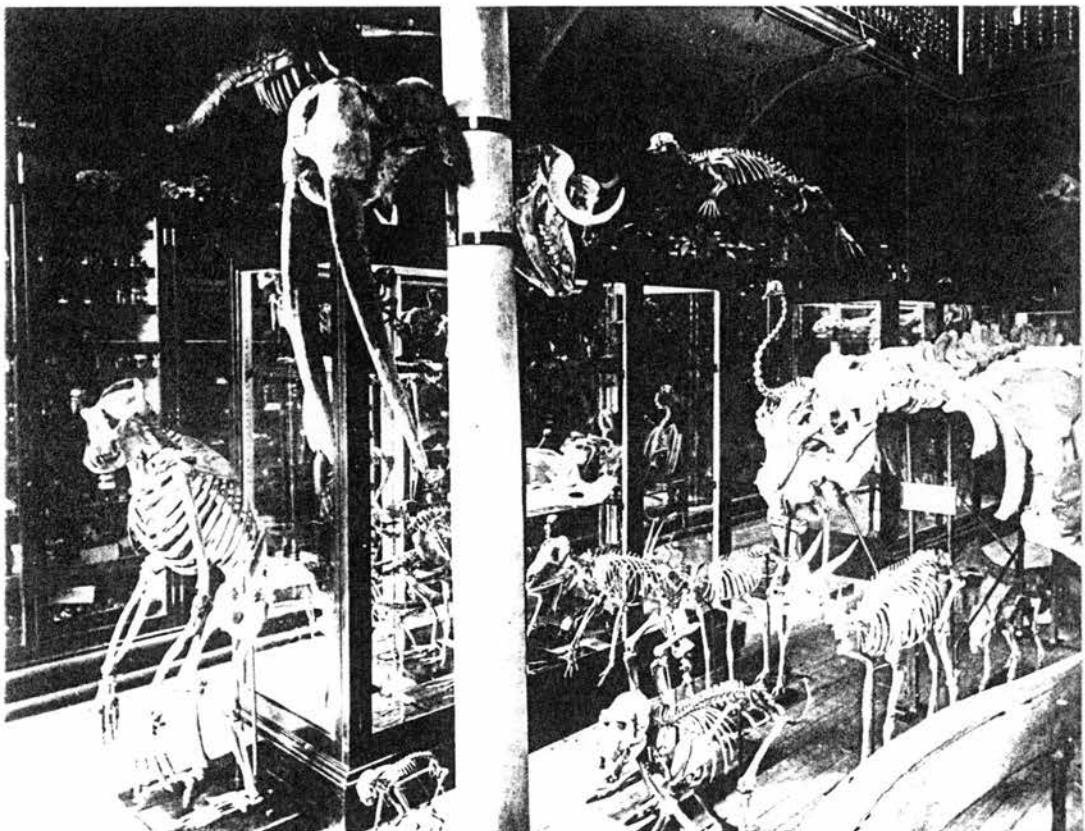


Fig. 91

Zoology Museum, Zoology Department, University College, Dundee

John Murray Robertson 1892

Photograph of the interior of the museum (looking north).



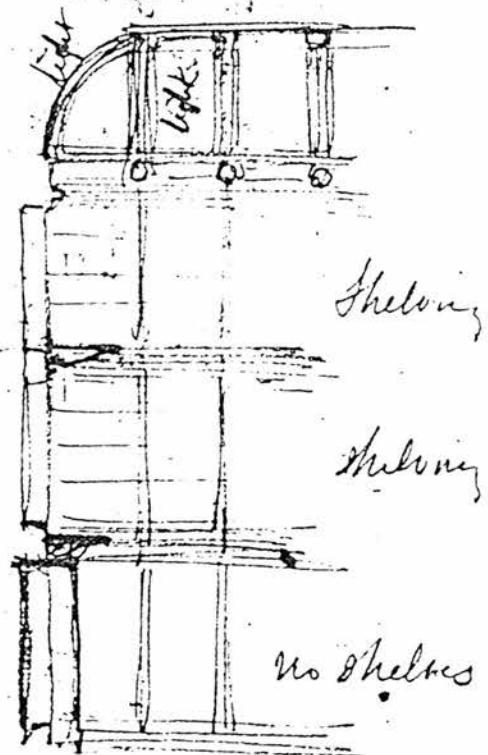
Fig. 92

Royal Scottish Museum, Chambers Street, Edinburgh

Francis Fowke 1861

Photograph of the interior of the museum.

College of Surgeons London
Palaeontological Room first



The upper part of ground floor is
dark stone floors, bottom stone slabs

Mr... will be used to make

Fig. 93

Palaeontological Museum, Royal College of Surgeons, London
George Dance 1806

Sketch of the double mezzanine by Robert Rowand Anderson.



Fig. 94

Ashmolean Museum, Oxford University

C. R. Cockerell 1845

Photograph of the front elevation.

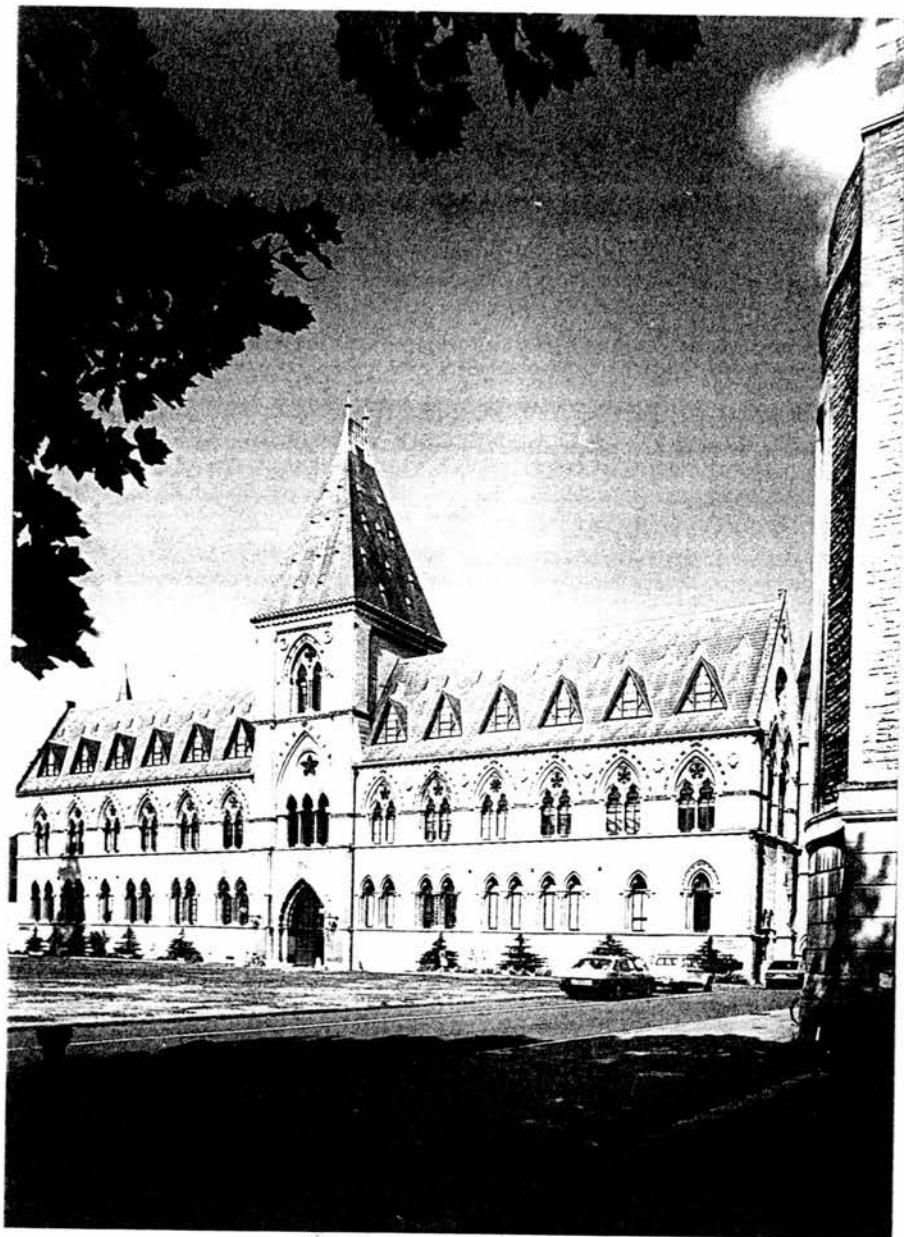


Fig. 95

University Museum of Natural History, Oxford University

T. Deane and B. Woodward 1860

Photograph of the front elevation.

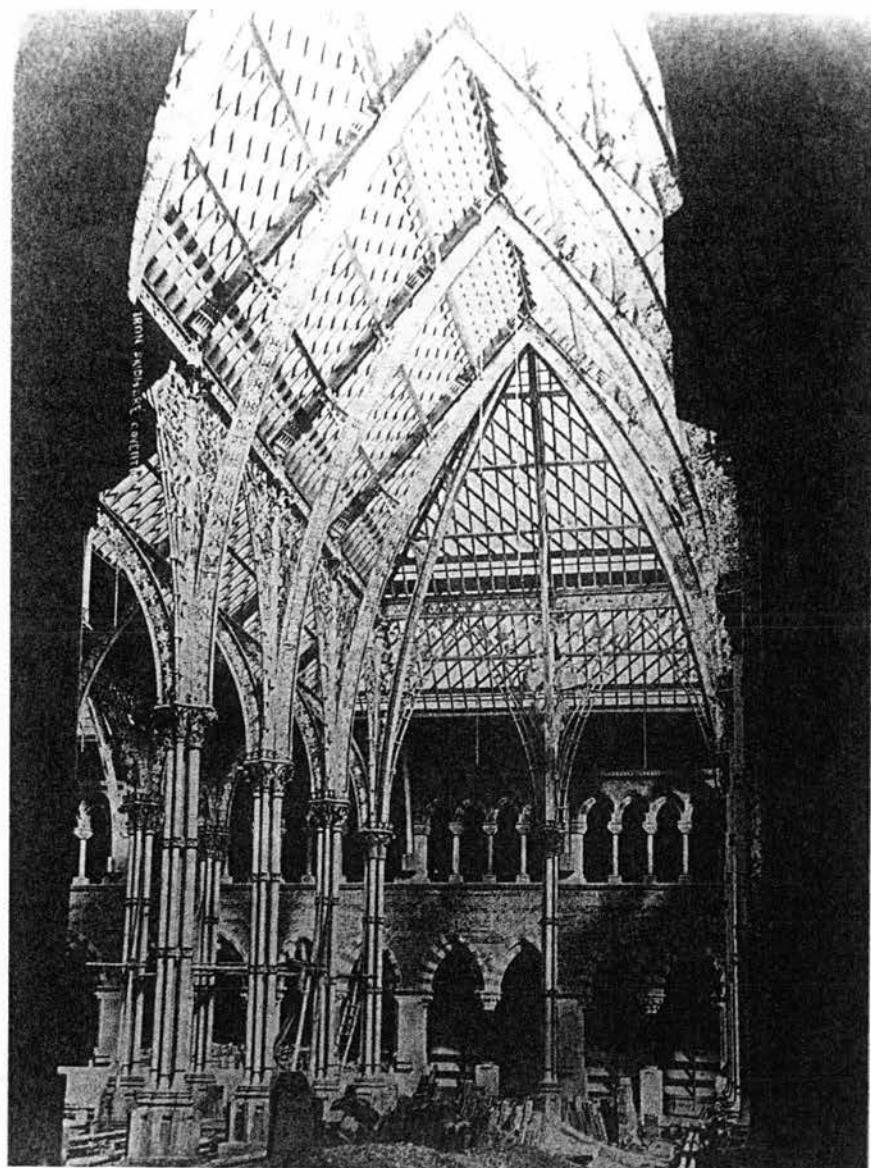


Fig. 96

University Museum of Natural History, Oxford University

T. Deane and B. Woodward 1860

Photograph of the interior during construction.



Fig. 97
Fitzwilliam Museum, Cambridge University
G. Basevi and C. R. Cockerell
Photograph of the front elevation.

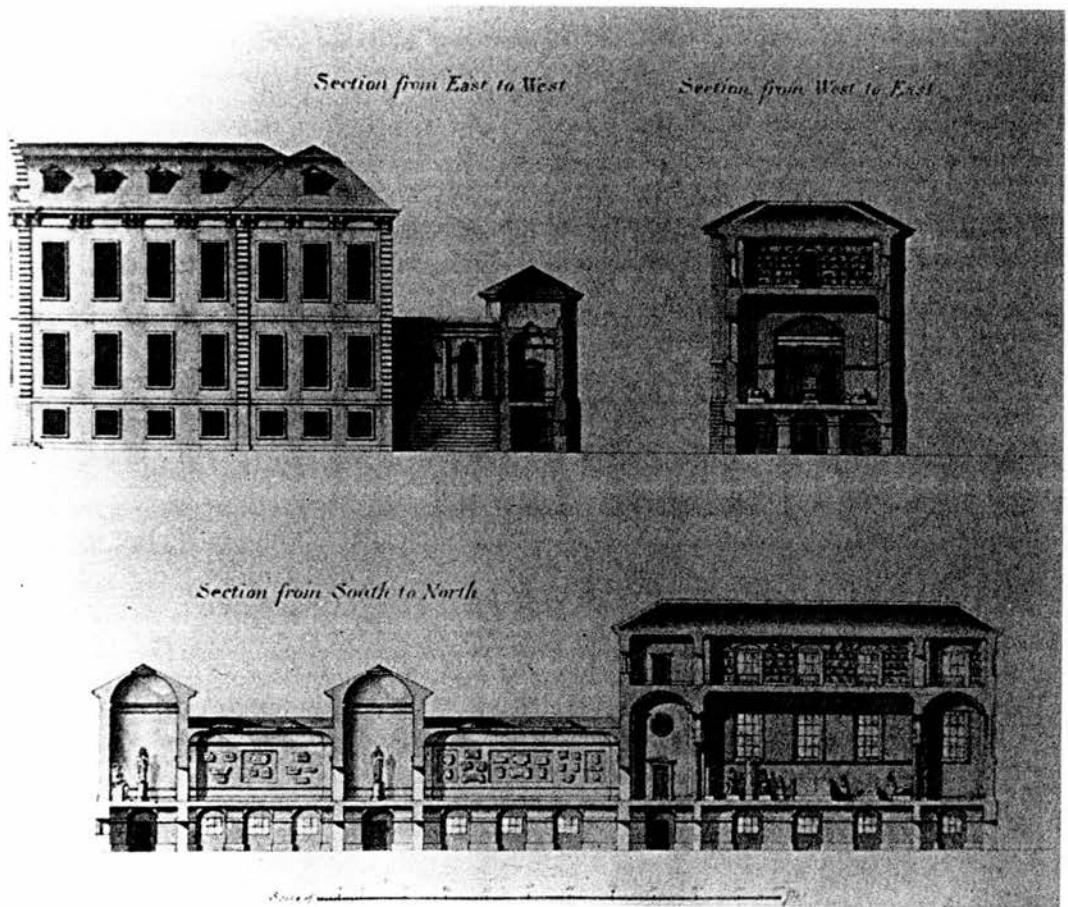


Fig. 98

Townley Gallery, British Museum, Montagu House, London

George Saunders 1803

Longitudinal and transverse sections.



Fig. 99
University College, London
William Wilkins 1826
Perspective view of the front elevation.

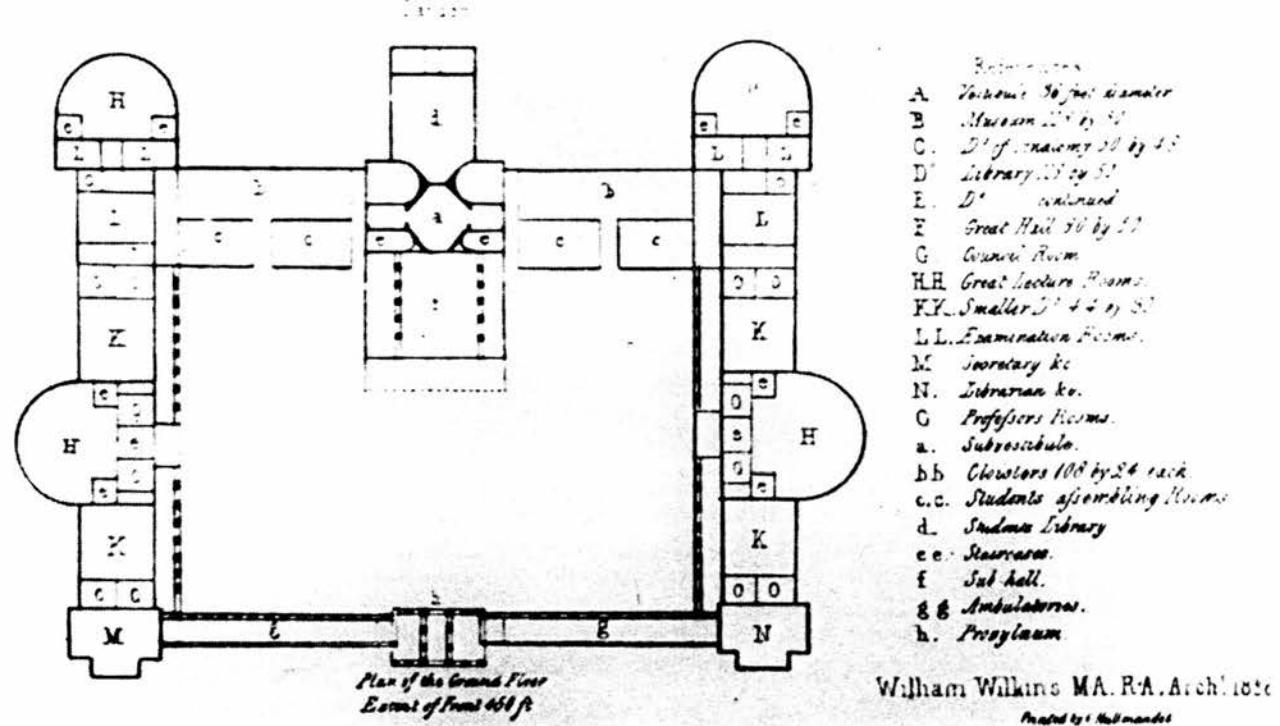


Fig. 100

University College, London

William Wilkins 1826

Plan of the ground floor.

Plan of the Principal Floor
 A. Porch 36 feet diameter.
 B. Museum 22' by 30'
 C. D' of Academy 30 by 45'
 D. Library 18 by 50'
 E. D' continued
 F. Great Hall 90 by 50'
 G. Council Room
 H.H. Great Lecture Rooms.
 K.K. Smaller D' 44 by 31'
 L.L. Examination Rooms.
 M. Secretary's
 N. Librarian's
 O. Professors' Rooms.
 a. Subscribers.
 b.b. Cloisters 108 by 24 each.
 c.c. Students' assembling Rooms.
 d. Sedmire Library
 e.e. Staircases.
 f. Sub-hall.
 g.g. Ambulatories.
 h. Parvyleum

William Wilkins MA R.A. Archt 1826

Made by W. H. Ward

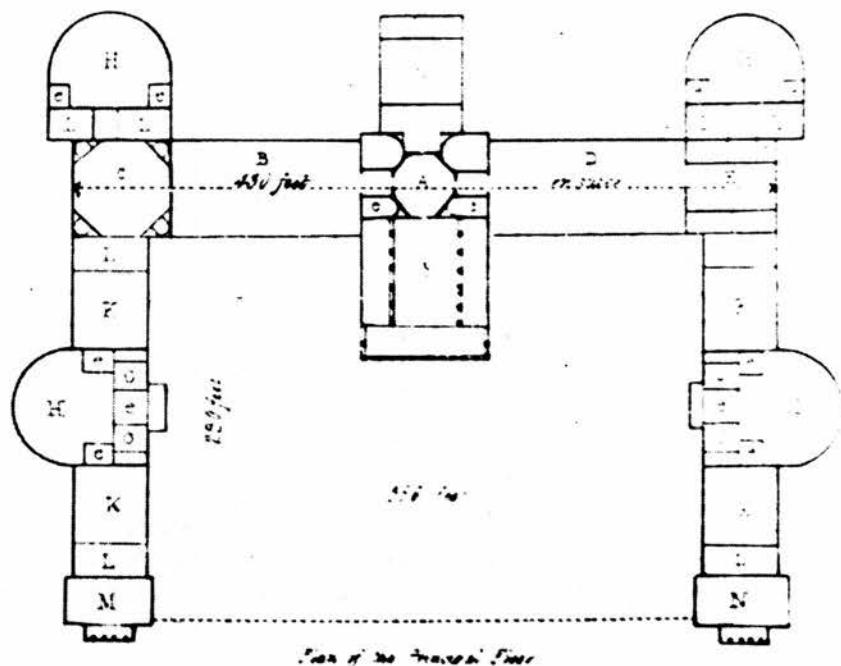


Fig. 101
 University College, London
 William Wilkins 1826
 Plan of the principal floor.



Fig. 102

Academy of Art, St. Petersburg

Jean Baptiste Vallin de la Mothe and Ivan Kokorinov 1765 - 1789

Photograph of the front elevation.

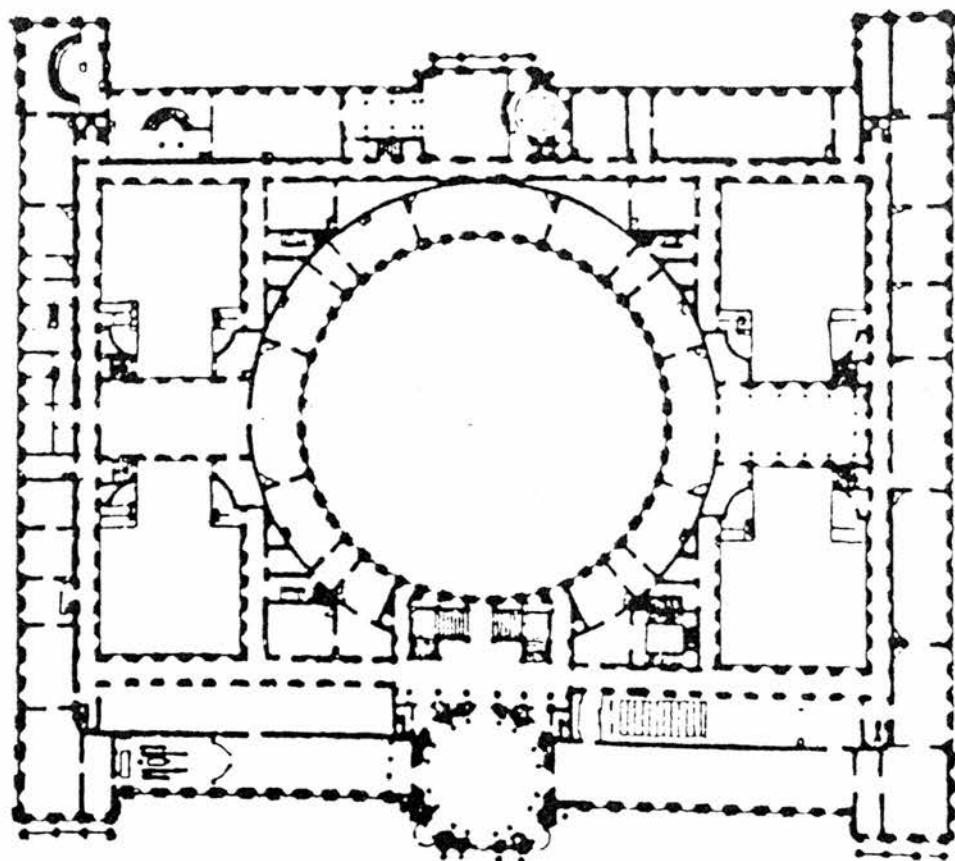


Fig. 103

Academy of Arts, St. Petersburg

Jean Baptiste Vallin de la Moth and Ivan Kokorinov 1765 - 1789

Plan of the principal floor.