

## MUSEUMS FOR THE PEOPLE

BY ALFRED R. WALLACE.

MUSEUMS of Natural History should be, one would think, among the most entertaining and instructive of public exhibitions, since their object is to show us life-like restorations of all those wonderful and beautiful animals, the mere description of which in the pages of the traveller, the naturalist, or the sportsman, are of such absorbing interest. Strange to say, however, such is by no means generally the case; and these institutions rarely appear to yield either pleasure or information at all proportionate to their immense cost. We can hardly impute this failure to anything in the nature of Museums or of their contents, when we remember that good illustrated works on natural history are universally interesting and instructive; and that private collections of birds, shells, or insects are often very attractive even to the uninitiated, and at the same time of the highest value to the student. We must therefore seek for an explanation of the anomaly in the system on which public museums are usually constituted, in the quality of the specimens, and in the mode of exhibiting them, all which, it is now generally admitted, are equally unsuited for the amusement and instruction of the public and for the purposes of the scientific student.

Public museums of natural objects being such entirely modern institutions, we can hardly wonder that no generally accepted principles have yet been laid down for their construction or arrangement. They most frequently originated with private collectors, whose plan was naturally followed in their enlargement; and when they outgrew their original domicile, an architect was called in, who, according to his special tastes, designed a temple or a palace for their reception. However inconvenient or unsuitable the original mode of exhibition

might turn out, or however ill adapted to its purpose the new building might prove, it would, of course, be exceedingly difficult and expensive to alter either of them, more especially as the modified plan might be found, after trial, to have defects as great as that which it replaced.

Quite recently, two eminent men (Dr. Gray and Dr. Hooker), both connected with great public museums, have made suggestions towards a more rational system; and as it is evident that museums will increase, and may be made an important agent in national education and the elevation of the masses of the people, it seems advisable that the subject should be brought forward for popular discussion.

Accepting the few general principles that seem now to be pretty generally agreed upon, I propose to follow them out into some rather important details.

I shall consider, in the first place, what should be the scope of a Typical Popular Museum, and then sketch out the arrangements best adapted to make it both entertaining and instructive to the young and ignorant, and a means of high intellectual culture and enjoyment to such as may be disposed to avail themselves fully of its teachings.

Museums are well adapted to illustrate all those branches of knowledge whose subject-matter consists mainly of definite moveable and portable objects. The great group of the natural history sciences can scarcely be taught without them; while mathematics, astronomy, physics, and chemistry make use of observatories and laboratories rather than museums. The fine and mechanical arts, as well as history, can also be illustrated by extensive collections of objects; and we are thus led to a broad division of museums, according as they deal mainly with natural objects or with works of art.

A museum of natural objects appears, for a variety of reasons, best fitted to interest, instruct, and elevate the middle and lower classes, and the young. It is more in accordance with their tastes and sympathies, as shown by the universal fondness for flowers and birds, and the great interest excited by new or strange animals. It enables them to acquire a wide and accurate knowledge of the earth and of its varied productions; and if they wish to follow up any branch of natural history as an amusement or a study, it leads them into the pure air and pleasant scenes of the country, and is likely to be the best antidote to habits of dissipation or immorality. Such museums, too, offer the only means by which the mass of the working classes can obtain any actual knowledge of the wonderful productions of nature in present or past ages; and such knowledge gives a new interest to works on geography, travel, or natural history. Owing to the wide disconnexion of these subjects from the daily pursuits of life, they are so much the better adapted for the relaxation of those who earn their bread by manual labour. The inexhaustible variety, the strange beauty, and the wondrous complexity of natural objects, are pre-eminently adapted to excite both the observing and reflective powers of the mind, and their study is well calculated to have an elevating and refining effect upon the character.

Works of art, on the other hand, though in the highest degree instructive and elevating to some minds, are not so universally attractive; and, what is more important, do not exercise so many faculties, and do not offer such wide and easily-reached fields of study for the working classes. Some previous training or special aptitude is required in order to appreciate them; and it may even be asserted with truth that the study of nature is a necessary preliminary to the appreciation of art. It does not seem improbable that, even if our object were to make artists and lovers of art, good museums of natural objects might be the most useful first step. We have further to consider that

objects of art are already widely spread, and more or less accessible. Our great public buildings contain their art-decorations. The houses of the wealthy and the shops of our streets are full of art, and the artisan has frequent opportunities of seeing them; while local exhibitions of art are not uncommon, and will no doubt be more frequent. The very young and the very ignorant would learn nothing in an art museum, while they would certainly gain both knowledge and pleasure in such an one as I am about to describe.

A Typical Museum of Natural History should contain a series of objects to illustrate all the sciences which treat of the earth, nature, and man. These are—1, Geography and Geology; 2, Mineralogy; 3, Botany; 4, Zoology; 5, Ethnology. I will briefly sketch what seems to be the best mode of illustrating these sciences in a museum for the people.

**GEOGRAPHY AND GEOLOGY.**—Some knowledge of the earth and its structure is so essential a preliminary to any acquaintance with natural history, and the working classes have so few opportunities of seeing large maps, globes, or models, that a good series of these should form a part of the museum. In particular, relief-maps, models and maps to illustrate physical geography and geology, large sections and diagrams, and large globes, should be so exhibited as to be closely and conveniently examined.

**MINERALOGY.**—A series of the most important and best marked minerals should be exhibited, with tables and diagrams explaining the principles of their classification. The number should not be too large, and every specimen should be accompanied by a label containing a brief account of all that was most interesting connected with it;—its chemical constitution, its affinities, its distribution, and its uses. Combined with this collection there should be a series of specimens illustrating the mode of manufacture of the more important minerals, and their application to the arts and sciences. To give a local in-

terest, all British specimens should be placed on tablets of one distinct colour, so as at once to catch the eye, and enable the student to form some idea of the comparative productiveness of his own country.

**BOTANY.**—The series of specimens to illustrate the science of botany in a popular museum may be of two kinds: such as show the main facts of plant-structure and classification; and others to teach something of the variety, the distribution, and the uses of plants.

By means of specimens, dissections, drawings, and models, the important radical differences of the great primary divisions of plants—cellular and vascular—acrogenous, endogenous and exogenous—might be made clearly manifest. Alongside of the drawings and dissections there should be cheap fixed microscopes showing the main structural differences, thus giving a reality and intensity to the characters which drawings or descriptions alone can never do.

Each of the most important natural orders of plants should next be illustrated by specimens of various kinds. Their structure and essential characters should first be shown, in the same way as the higher groups. Their geographical distribution should be marked out on a small map. Good dried specimens, and, if necessary, drawings or models of flowers or fruit, of the more characteristic and remarkable species, should then be exhibited; and along with these, samples of whatever useful products are derived from them. Where remarkable forest-trees occur in an order, good coloured drawings of them should be shown, as well as longitudinal and cross sections of their wood. In the same, or an adjoining case, specimens or casts of the most important fossil-plants of the same order may be exhibited, illustrating their range backward into past time.

By such a scheme as this, in a comparatively small space and with a small number of specimens, all that is of most importance in the vegetable kingdom would be shown. The attentive observer might learn much of the

structure, the forms, and the varied modifications of plants: their classification and affinities; their distribution in space and time; their habits and modes of growth; their uses to savage and to civilized man. An outline of all that is most interesting and instructive in the science would be made visible to the eye and clear to the understanding; and it does not seem too much to expect that, so exhibited, Botany would lose much of its supposed difficulty and repulsiveness, and that many might be thereby induced to devote their leisure to this most useful and attractive study.

In order to assist those who are really students, a separate room should be provided, containing a Herbarium of British plants, as well as one illustrative of the more important exotic genera; and to this should be attached a collection of the more useful botanical works.

**ZOOLOGY.**—Owing to the superior numbers and greater variety of animals, their more complicated structure and more divergent habits, the higher interest that attaches to them, and their greater adaptability for exhibition, this department must always be the most extensive and most important in a Natural History Museum.

The general principles guiding the selection and exhibition of animals are the same as have been applied to plants, subject to many modifications in detail. The great primary divisions, or sub-kingdoms (Vertebrata, Mollusca, &c.), as well as the classes in each sub-kingdom (Mammalia, Birds, &c. and Cephalopoda, Gasteropoda, &c.), should be defined, by means of skeletons and anatomical preparations or models, so as to render their fundamental differences of structure clear and intelligible. At the head of each order (or subdivision of the class) a similar exposition should be made of essential differences of structure; and in every case the function or purpose of these differences should be pointed out by means of clearly-expressed tables and diagrams.

We now come to the specimens of Animals to be exhibited, in order to

give an adequate idea of their variety and beauty; their strange modifications of form and structure, their singular habits and mode of life, their distribution over the surface of the earth, and their first appearance in past time. To do this effectively requires a mode of exhibition very different from that which has been usually adopted in museums.

Throughout the animal kingdom, at least one or more species of every Family group should be exhibited; and in the more important and interesting Families, one or more species of each Genus. The number of specimens is not, however, so important as their quality and the mode of exhibiting them. A few of the more important species in each Order, well illustrated by fine and characteristic specimens, would be far better than ten times the number if imperfect, badly prepared, and badly arranged. Let any one look at an artistically mounted group of fine and perfect quadruped or bird skins, which represent the living animals in perfect health and vigour, and by their characteristic attitudes and accessories tell the history of the creature's life and habits; and compare this with the immature, ragged, mangy-looking specimens one often sees in museums, stuck up in stiff and unnatural attitudes, and resembling only mummies or scarecrows. The one is both instructive and pleasing, and we return again and again to gaze upon it with delight. The other is positively repellent, and we feel that we never want to look upon it again.

I consider it therefore an important principle, that in a Museum for the People nothing should be exhibited that is not good of its kind, and mounted in the very best manner. Fortunately, specimens of a large number of the most beautiful and extraordinary animals are now exceedingly common, and every well-marked group in nature may be well illustrated without having recourse to the rarer and more costly species. Carrying out these views, we should exhibit our animal in such a way as to convey the largest amount of

information possible. The male, female, and young should be shown together; the mode of feeding or of capturing its prey, and the most characteristic attitudes and motions, should be indicated; and the accessories should point out the country the species inhabits, or the kind of locality it most frequents. A descriptive tablet should of course give further information; and in the immediate vicinity, specimens showing any remarkable points of its anatomy, and any useful products that are derived from it, should be exhibited.

Each group of this kind would be a study of itself, and should therefore be kept quite distinct and apart from every other group. It should be so placed that it could be seen from several points of view, and every part of each individual composing it closely examined. To encourage such examination and study, seats should be placed conveniently near it—a point strangely overlooked in most museums, where it seems to be taken for granted that visitors will pass on without any desire to linger, or any wish for a more close examination. It would add still further to the interest of these typical groups if it were clearly shown how much they represented, by giving a list of all the well-known species of the genus or family, with their native country and proportionate size, and indicating, by means of a coloured line, which of them were exhibited in the museum. This would be an excellent and most intelligible guide to the collection itself, and would enable the visitor to judge how far it gave any adequate notion of the variety and exuberance of nature.

It would also, I think, be advisable, that as far as possible each well-marked group of any considerable extent should occupy one room or compartment only, where it would be separated from all others, where the attention could be concentrated upon it, and where the extent to which it was illustrated could be seen at a glance. This has not, I believe, been yet attempted in any museum; and when I come to speak of the building arrangements, I will explain



how it can be easily managed. In this room, a department would also be devoted to the comparative anatomy of all the more important species and groups exhibited; and a large map should be suspended, showing in some detail their geographical distribution. Here, too, we should place specimens or casts of the fossil remains of the family, with restorations of some of the more important species; and along with these, diagrams, showing the progress of development of the group throughout past time, as far as yet known.

This mode of attractive and instructive exhibition might be well carried out in the Mammalia, Birds, and Insects; less perfectly in the Reptiles and Fishes whose colours can hardly be well preserved except in spirits. Even here, however, by using oblong earthenware vessels with glass fronts, instead of the usual bottles, many fishes and marine animals could be exhibited in life-like attitudes and with their colours well preserved. Mollusca may be well illustrated by means of models of the animals, as also may the marine and fresh-water Zoophytes. The more minute and delicate animals should be shown by means of a series of cheap microscopes or large lenses, fixed in suitable positions; and with a careful outline of the animal's history on a tablet or card, close by.

Connected with this, as with the botanical division of the museum, there should be a students' department, to which all should have free access who wished to obtain more detailed knowledge. Here would be preserved, in the most compact and accessible form, all specimens acquired by the museum, which were not required or were not adapted for exhibition in the popular department. Here, too, should be formed a complete local or British collection of indigenous animals, according to the extent and means of the institution, with the best zoological library of reference that could be obtained. In this department, donations of almost any kind would be acceptable; for, when not required for popular exhibition, an immense number of specimens can be

conveniently and systematically arranged in a very limited space, and for purposes of study or for identification of species are almost sure to be of value. One of the greatest evils of most local museums is thus got rid of—the giving offence by refusing donations, or being forced to occupy much valuable space with such as are utterly unfit for popular exhibition.

**ETHNOLOGY.**—We now come to the last department of our ideal Museum, and it is one to which a large or a small proportion of space may be devoted, according to the importance that may be attached to it. In accordance with the plan already sketched out for other departments, the following would be a fair representation of Ethnological science.

The chief well-marked races of man should be illustrated either by life-size models, casts, coloured figures, or by photographs. A corresponding series of their crania should also be shown; and such portions of the skeleton as should exhibit the differences that exist between certain races, as well as those between the lower races and those animals which most nearly approach them. Casts of the best authenticated remains of prehistoric man should also be obtained, and compared with the corresponding parts of existing races. The arts of mankind should be illustrated by a series, commencing with the rudest flint implements, and passing through those of polished stone, bronze, and iron—showing in every case, along with the works of prehistoric man, those corresponding to them formed by existing savage races. Implements of bone and of horn should follow the same order.

Pottery would furnish a most interesting series. Beginning with the rude forms of prehistoric races, and following with those of modern savages, we should have the strangely-modelled vessels of Peru and of North America, those of Egypt, Assyria, Etruria, Greece, and Rome, as well as the works of China and of mediæval and modern Europe.

The art of sculpture and mode of ornamentation should be traced in like

manner, among savage tribes, the Oriental nations, Greece, and Rome, to modern civilization. Works in metal and textile fabrics would admit of similar illustration. Characteristic weapons should also be exhibited; and painting might be traced in broad steps, from the contemporary delineation of a Mammoth up to the animal portraiture of Landseer.

This comprises a series of Ethnological illustrations that need not occupy much space, and would, I think, be eminently instructive. The clothing, the houses, the household utensils, and the weapons of mankind, can hardly be shown with any approach to completeness, in a Popular Museum; and many of these objects occupy space quite disproportionate to their intrinsic interest or scientific value. They could in most cases be sufficiently indicated by drawings or models.

The Museum here sketched, beginning with illustrations of the earth and its component minerals, passing through the whole vegetable and animal kingdoms, and culminating in the highest art-products of civilized man, would combine a very wide range of objects with a clearly limited scheme, and would, I believe, well answer to the definition of a Typical Museum of Natural History. Although of such wide scope, it need not necessarily occupy a very large space; and I believe it might be instructively carried out in a building no larger than is devoted to many local museums. This brings me to say a few words on the kind of building best adapted to such an institution as is here sketched out.

In his President's address to the British Association at Norwich, Dr. Hooker made some admirable remarks on the situation of museums. He observed: "Much of the utility of museums depends on two conditions often strangely overlooked, viz. their situation, and their lighting and interior arrangements. The provincial museum is too often huddled away almost out of sight, in a dark, crowded, dirty thoroughfare, where it pays dear for ground-rent, rates, and taxes, and

"cannot be extended. Such localities are frequented by the townspeople only when on business, and when they consequently have no time for sight-seeing. In the evening, or on holidays, when they would visit the museum, they naturally prefer the outskirts of the town to its centre. . . . The museum should be in an open grassed square or park, planted with trees, in the town or its outskirts; a main object being to secure cleanliness, a cheerful aspect, and space for extension. Now, vegetation is the best interceptor of dust, which is injurious to the specimens as well as unsightly, whilst a cheerful aspect, and grass and trees, will attract visitors, and especially families and schools." Evidently, then, the proper place for the museum is the centre of the park or public garden. This furnishes the largest and cleanest open space, the best light, the purest air, and the readiest access. With how much greater pleasure the workman and his family could spend a day at the museum, if at intervals they could stroll out on to the grass, among flowers and under shady trees, to enjoy the refreshments they had brought with them. They would then return to the building with renewed zest, and would probably escape the fatigue and headache that a day in a museum almost invariably brings on. How admirably adapted for the National Museum of Natural History would be the centre of the Regent's or Hyde Park!

In designing museums, architects seem to pay little regard to the special purposes they are intended to fulfil. They often adopt the general arrangement of a church, or the immense galleries and lofty halls of a palace. Now, the main object of a museum-building is to furnish the greatest amount of well lighted space, for the convenient arrangement and exhibition of objects which all require to be closely examined. At the same time they should be visible by several persons at once without crowding, and admit of others freely passing by them. None except the very largest specimens should be placed so as to rise higher than seven feet above the floor,

so that palatial rooms and extensive galleries, requiring proportionate altitude, are exceedingly wasteful of space, and otherwise ill adapted and unnecessary for the real purposes of a museum. It is true that side-galleries against the walls may be and often are used to utilize the height, but these are almost necessarily narrow, and totally unadapted for the proper exhibition of any but a limited class of objects. By this plan, too, the whole upper-floor space is lost, which is of great importance, because a large proportion of objects are best exhibited on tables or in detached cases.

Following out this view, a simple and economical plan for a museum would seem to be, a series of long rooms or galleries, about thirty-five or forty feet wide, and twelve or fourteen feet high on each floor, the four or five feet below the ceiling on both sides being an almost continuous series of window openings, while at rather wide intervals the windows might descend to within three feet of the floor. At such distances apart as were found most convenient for the arrangement of the collections, moveable upright cases might be placed transversely, leaving a central space of about five feet for a continuous passage; and the compartments thus formed might be completed by partitions and doors connecting opposite cases, wherever it was thought advisable to isolate any well-marked group of animals, or other division of the museum. By this means the proportion between wall-cases and floor space might be regulated exactly according to the requirements of each portion of the collection; and abundant light would be obtained for the perfect examination of every specimen.

Two of the great evils of museums are, crowding and distraction. By the crowding of specimens, the effect of each is weakened or destroyed; the eye takes

in so many at once that it is continually wandering towards something more strange and beautiful, and there is nothing to concentrate the attention on a special object. Distraction is produced also by the great size of the galleries, and the multiplicity of objects that strike the eye. It is almost impossible for a casual visitor to avoid the desire of continually going on to see what comes next, or wondering what is that bright mass of colour or strange form that catches the eye at the other end of the long gallery. These evils can best be avoided, by keeping, as far as possible, each natural group of objects in a separate room, or a separate compartment of that room—by limiting as much as possible the numbers of illustrative groups of species, and at the same time making each group as attractive and instructive as possible. The object aimed at should be, to compel attention to each group of specimens. This may be done by making it so interesting or beautiful at first sight as to secure a close examination; by carefully isolating it, so that no other object close by should divide attention with it; and by giving so much information and interesting the mind in so many collateral matters connected with it as to excite the observant and reflective as well as the emotional faculties.

The general system of arrangement and exhibition here pointed out does not at all depend on the building. It can be applied in any museum, and is, I believe, already to some extent adopted in our best local institutions. It has, however, never yet been carried out systematically; and till this is done, we can form no true estimate of how popular a Natural History Museum may become, or how much it may aid in the great work of national education.