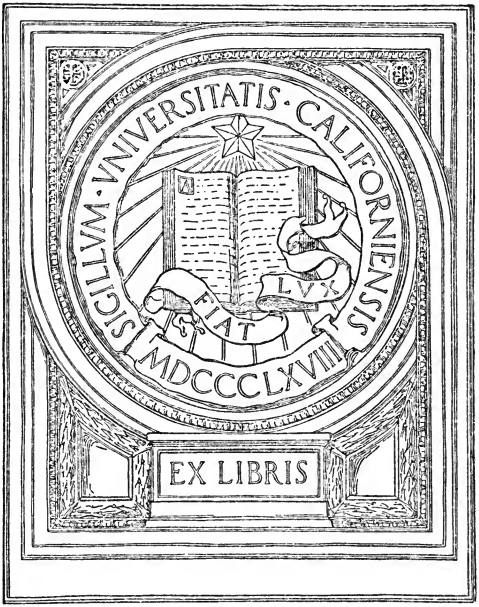
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LONDON COUNTY COUNCIL.

GUIDE

TO THE COLLECTIONS IN

THE HORNIMAN MUSEUM AND LIBRARY,

FOREST HILL, LONDON, S.E.

(Third Edition).

1921.

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THE HORNIMAN MUSEUM AND LIBRARY.

1921.

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Mr. FRANK FINN, B.A., F.Z.S., acts as Guide-demonstrator at the Museum on certain days of the week.

CONTENTS.

PLANS.

THE HORNIMAN MUSEUM.

Founded, in 1890, by Frederick John Horniman, Esq., M.P., F.R.G.S., F.L.S. ; rebuilt in 1900 ; and, in 1901, presented by him, with the adjoining Horniman-gardens, to the London County Council, as a Free Gift to the People, for ever.*

The bronze drinking fountain in the forecourt was presented by Mr. Emslie J. Horniman, and in the entrance lobby of the Museum is a bronze bust of Mr. F. J. Horniman.

The External Mosaic Panel.†

The subject is an allegory of the course of human life. The central figure typifies Humanity in the House of Circumstance ; the wall indicates the limitations of human nature generally, and terminates at one end in the Gate of Life and at the other in that of Death ; these lead respectively out of and into a land of fruits and flowering trees, symbols of the things we believe in or hope for, but which are beyond our exact knowledge. By the side of Humanity stand figures symbolising Fine Arts, Poetry, and Music ; Endurance, an armed figure, holds a shield and sword, with which to equip Humanity when the kneeling figures, Love and Hope, have clothed him with their qualities. Near by are Charity, bearing figs and wine, white-haired but virile Wisdom, Meditation in her sad-hued garments, and finally Resignation, resting on his staff, stands immediately in front of the Gate of Death.

THE MUSEUM BUILDING.

The main building consists of two large galleried halls at different levels, with a corridor extending along the east side. The direction of the main axis of the building is almost due north and south, the entrance being at the south end.

* Inscription on a bronze tablet in front of the Museum.

† Designed by Mr. R. Anning Bell.

The two halls are the Lower, or South, Hall, and the Upper, or North, Hall. The gallery or balcony of the lower hall is on the same level as the floor of the upper hall. Each hall is 100 feet long by 47 feet wide, and each balcony is 6 feet wide, except at the north end in each case, where the width is considerably greater. The entire building is 258 feet long by 61 feet wide, and there is a clock tower about 100 feet in height. The total area is 16,485 feet. The cost of erection was about £40,000, and the architect was Mr. C. Harrison Townsend, F.R.I.B.A., who also designed the new Lecture Hall and Library (see below).

In addition to the main halls and their balconies, and the east corridor, other public rooms are the room opening opposite the head of the main stairs, and the Students' Room (containing mainly cabinets of insects), opening from the north balcony The remaining rooms on the east side of the building are occupied by the officers of the Museum.

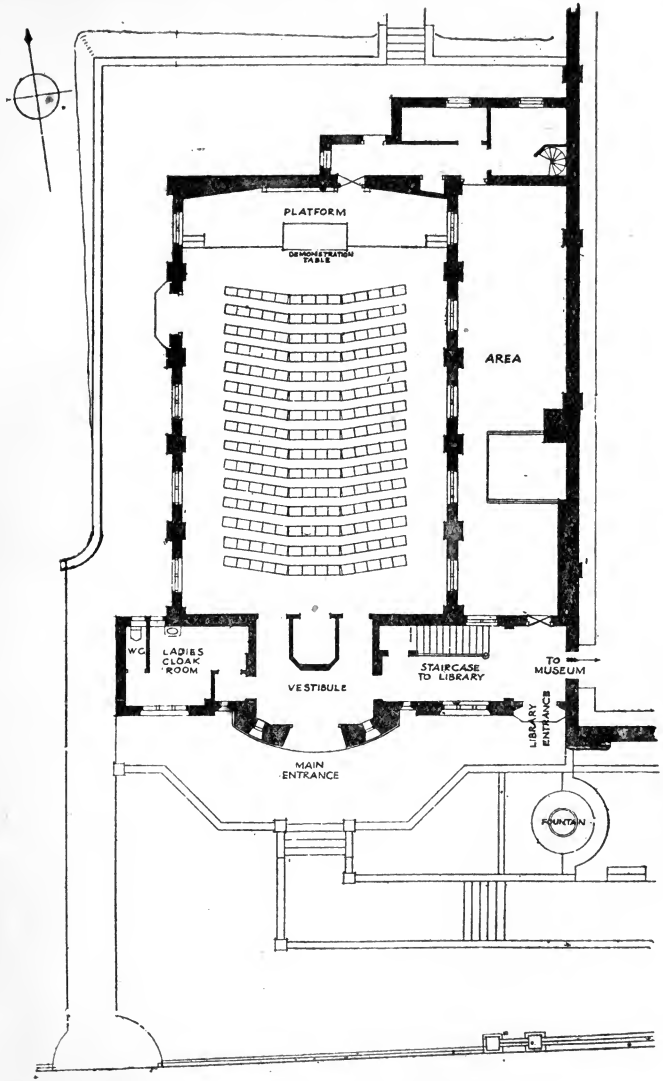
The main stairs lead from near the upper end of the lower hall to the central landing, which lies between the South Balcony and the North Hall. The corridors may be reached by turning to the right instead of going up the main stairs, and there is also an entrance from the North Hall. There are two sets of stairs to the North Balcony, one leading from the South Balcony, and the other from the north end of the North Hall.

The only entrance to the Museum is that on the main road. There is, however, an exit to the Horniman Gardens at the north end of the corridor. Beneath the tower is a lock-up store, in which cycles and perambulators are stored at the charge of one penny each.* Sticks, umbrellas, parcels, etc., must be left in charge of the attendant at the entrance to the Museum (no fee).

THE LECTURE HALL AND LIBRARY.

This part of the building lies to the west of the Museum itself. It has two principal floors, and over the main entrance is a small mezzanine floor. On the ground floor is the Lecture

* No responsibility is accepted by the Council for loss of, or damage to, any article placed in the cycle store.



LECTURE HALL

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Hall, and above it is the Library. On the mezzanine is the lantern chamber, which is of fireproof construction. The building is in direct communication with the Museum, on the ground floor by a public door, and on the first floor by one for the use of the staff only.

The lecture hall has seats for an audience of 210. The wall behind the platform has sliding blackboards in the centre, and on either side it is whitened to serve as a lantern screen. By this arrangement two lanterns can be used at once, and the lantern chamber has also been constructed with this end in view.

The library has seats and tables for 24 readers, and the usual library fittings are provided. The book-store is enclosed by a glazed screen and has accommodation for about 7,500 volumes.

The building has been designed to harmonise with the Museum, and the front, like that of the latter, is of Doulting stone, the remainder being of brickwork with stone dressings.

The lecture hall, which is open only when lectures are being given, may be entered from the front or through the Museum. Whilst the Museum is open the library is entered from the Museum only, through a door directly opposite to the turnstile ; the special external door to the library is opened when the Museum closes, if the library remains open after this occurs.

INSTRUCTION IN THE MUSEUM.

Free public lectures on scientific subjects are given at the Museum, chiefly during the autumn and winter months. All lectures are advertised in advance, and handbills may be obtained at the Museum ; notices are also sent to local libraries and to the Press, and the lectures are announced in the *London County Council Gazette*. Some of the lectures are mainly for teachers, whilst others are for the general public and are of a less technical nature.

A guide-lecturer is at the disposal of visitors on certain afternoons in the week, when a conducted tour is open to all who wish to join it. (See special notices.)

GUIDE TO THE COLLECTIONS.

INTRODUCTION.

Finality in the arrangement of the contents of a museum can only be arrived at by renouncing the idea of progress, and a Guide which does not gradually become more or less obsolete should be regarded as a standing reproach. Discrepancies between the contents of the cases and the descriptions given in the Guide begin to develop as soon as this has gone to press, and they may be taken as indications that the Museum is in a living condition.

In the re-arrangements and additions that have been made during the time that has elapsed since the first Guide to the Horniman Museum was issued, the leading motive has been to convert a heterogeneous collection into one which will be of service to students of all ages, whilst at the same time maintaining its interest for those of the general public who have not lost the power and inclination to acquire knowledge.

The arrangement of the greater part of the collections is designed to throw light upon the evolutionary processes by which the changing present has been derived from the unstable past. Only a small portion of such a vast field can be covered in a small museum ; evolution in the animal kingdom, and in the earlier stages of the arts, crafts, and industries of man, afford more than sufficient scope, and the collections have certain limitations which are referred to below.

An essential part in the explanation of the contents of the Museum is played by the Handbooks that have been issued (see back of cover), and these will be added to from time to time. The lectures to teachers, the public lectures, and the tours conducted by the guide-lecturer, have also, in the main, the same object. Beginning with the specimens and their arrangement, and passing through the labels, the Guide, the Handbooks, the Lectures and Demonstrations, and the books and treatises in the Library, there is provided a graduated scale which is, it is hoped, adapted to meet the needs of most classes of visitors.

The two departments of Ethnology and Zoology practically coincide with the two halls which form the greater part of the Museum.

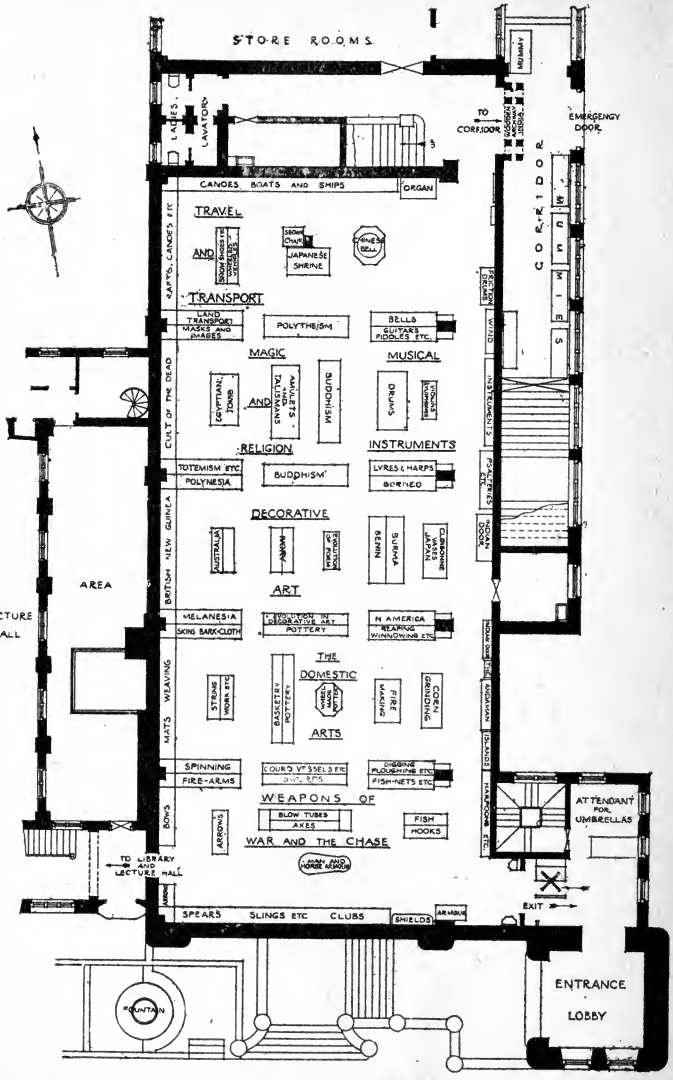
The South Hall is mainly devoted to the comparative and evolutionary treatment of man's simpler tools, weapons, utensils, and other appliances ; it therefore deals chiefly with that branch of Ethnology which is called Primitive Technology. Objects such as clubs, or baskets, or spindles, are grouped together for comparison, the series beginning with the simpler types and passing on to the more complex ; the geographical system of arrangement is only adopted in a few cases.

The North Hall contains the Zoological collections, which include series illustrating evolution, animal locomotion, animal defences, and the classification, structure, and life-history of the main groups of the animal kingdom. There are also reference collections of insects, shells, and birds' eggs, and a number of vivaria and aquaria for the exhibition of living British land, freshwater, and marine animals (birds and mammals are excluded). The division of the North Hall nearest to the main staircase is occupied by comparative series illustrating the structure (chiefly the skeletons) of the anthropoid apes and man. Casts of the more important prehistoric skulls, representing early man, are also exhibited, and there is a case devoted to the illustration of the chief characters used in the broad classification of the modern races of man.

The books in the Reference Library relate for the most part to various branches of anthropology and zoology, but there is a limited number of standard works on botany, physiology, geology, and other natural sciences. No ticket is necessary for admission to the Library, and the formalities for obtaining books are reduced to their lowest terms. Further details will be found on pages 124 to 126, and in the Handbook to the Library and its Supplement.

ETHNOLOGICAL DEPARTMENT.

The available evidence points to the conclusion that man's remote ancestors were ape-like animals, owing many of their special characters to an arboreal ancestry. The existing apes have no artificial tools or weapons, and this was no doubt the case with the precursors of man himself. Beginning probably with the use of sticks and stones picked up casually and used on impulse, the ape-men gradually became tool-users. A great advance was made when they were no longer content with the implements provided by nature and its accidents, but learnt to fashion natural materials to more serviceable shapes. This was the beginning of invention, whose end is not yet. Man's artificial contrivances grew in efficiency and complexity, not as the result of great inventive strides, but by a series of gradual improvements due to the ingenuity of many individuals, or even generations. The course of the evolution of the older and simpler types of appliances—such as the bow, the spindle, or the dug-out canoe—cannot be traced, but there are many cases in which the stages in development can be indicated with a considerable degree of certainty. The evidence available is mainly indirect, and is derived from the study of the relics of prehistoric man, the remains and records of historical peoples, the persistence of primitive ideas and appliances in advanced civilisations, and the methods and implements of modern backward races. It is by the exhibition and arrangement of specimens from such sources as these that the attempt is made in the Horniman Museum to suggest the general line of advance in arts, crafts, and ideas from the time of early man, to the stage when the rapid progress made during the last century brought about a veritable metamorphosis in the life of civilised communities. The scheme does not include the tracing of the evolution of modern machinery, and it is only the early steps in invention that receive detailed treatment. Since the backward races of Asia, Africa, Oceania, and America—in so far as they have not become semi-civilised or extinct—still make use of simple primitive contrivances analogous to those dis-



LOWER OR SOUTH HALL

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carded by our remote ancestors, a large part of the collection consists of specimens from such peoples.

The table of Contents (pp. 5, 6) of this Guide may be consulted for a summary of the chief sections and series in the department.

The South Hall.

I. WEAPONS OF WAR AND THE CHASE.

There is no race of men so low in culture as to have no weapons. Contrivances for killing or capturing animals play an important part in the life of many uncivilised peoples, and upon such appliances, as well as upon those devised for fighting against his fellow-men, the savage or barbarian (like civilised man) often lavishes all his ingenuity and skill.

The weapons here exhibited are arranged as far as possible in the probable order of evolution of the class to which they belong. Thus stunning and crushing weapons precede those made for piercing, the spear precedes the bow and arrow, the plain-bow the cross-bow, and the latter the gun. The main classification is into stunning or crushing weapons, piercing weapons, and cutting weapons. Except in a few cases the weapons of war are placed alongside others which may be used in hunting. In some instances the same weapon is known to be used for both purposes. There are, however, several series devoted entirely to weapons and appliances used only in hunting or fishing, such as fish-spears and fish-arrows, harpoons, fish-hooks, etc.

Weapons of defence and armour are not treated in any detail, and many of the shields will be found at the back of the cases. Others are arranged to illustrate the probable course of evolution of the shield.

The visitor should examine the various series as far as possible in the order given below. This section is treated in considerable detail in the Handbook to Weapons of War and the Chase, and for this reason no general description of the various types is given here.

Stunning or Crushing Weapons.

[Wall Cases 1 to 6.]

Wooden clubs from Australia, the islands of the Pacific (Melanesia and Polynesia), North and South America, Africa, Ireland (a shillelagh).

Bone club from New Zealand (Maori).

Stone clubs from New Zealand (Moriori and Maori).

Stone-headed clubs from New Guinea and New Britain (West Pacific), and North America.

Maces of metal or with metal heads from Africa and India, and a German trench-club used in the Great War. Iron and bronze clubs from China.

Ball-and-thong clubs from North America (Eskimo and Indian), war flail of mediæval Europe, and modern "life-preserver" from Sheffield.

Modern derivatives of the club and mace: policeman's staff, high sheriff's staff, tipstaff.

Missile clubs from North America, the Fiji Islands, Borneo, and Africa ("knobkerries").

Flat missile clubs from Darfung (Egyptian Sudan); **boomerangs** from Australia.

Missile stones from the Pacific Islands, represented by an artificially-shaped rod of volcanic rock, from Tanna in the New Hebrides, and shaped stones from Savage Island.

Slings and slingstones from New Guinea, New Britain, and New Caledonia (West Pacific), Peru, Palestine, Egypt, and England (Bedfordshire).

Capturing and Entangling Weapons.

[Wall Case 6.]

Lasso of hide, from Argentina.

Bolas from Patagonia, and bird bolas from the Aleutian Islands. A bolas game from East Africa.

Man-catcher from British New Guinea.

Piercing Weapons.

[Wall Cases 7 to 16 and Table Case.]

Spears: *wooden-pointed*, from the Islands of the Pacific and Australia; *bone-pointed or -barbed*, Australia, Solomon Islands, Ecuador, Africa; *pointed or barbed with sting-ray*

spines, Australia, New Caledonia ; *antelope horn point*, East Africa ; *stone-pointed or-barbed*, Australia, Admiralty Islands ; *metal-pointed*, Africa, Asia, Old English.

Spear-throwers : *of cord*, New Caledonia ; *of wood*, Australia, New Guinea, Arctic regions (Eskimo).

Bows and arrows :—

Arrows : *with points of wood, bone, sting-ray spine, cassowary claw*, etc., from the West Pacific, America, Africa (*see also* Construction of Arrows case) ; *with points of iron or steel*, from America, Africa, Asia.

Whistling arrows from China.

Quivers and arrows from America, Africa, and Asia, including a Bushman's quiver with poisoned iron-tipped arrows, from South Africa, and a quiver with bamboo-pointed poisoned arrows, Ainu of Japan.

The *Construction of arrows* is illustrated by a special series, showing the parts and materials of which an arrow may be made up, and the methods by which the parts are attached to each other (*see* Handbook to Weapons).

Aeroplane dart of steel, made at Enfield in 1916 ; winged to ensure its fall with the point downwards. This is, of course, not an arrow, since it was not discharged from a bow, but dropped from a height.

Plain bows of bamboo, palm-wood, etc., from the Pacific, Africa, and Asia, including the peculiar bow of the Andamanese, and a pellet-bow from Burma.

Composite bows, from simple types, such as those of wood (or bone) and sinew of the Eskimo and the Indians of North America, to the complex types of China and Persia (" Tatar " bows), in which the bow is built up of wood, sinew, horn, glue, and sometimes other materials. Chinese bow-cases.

Crossbows from Africa, Burma, China, and Europe. The Fan crossbow from West Africa, the Chinese repeating crossbow, and the English mediæval steel bow with windlass are specially interesting.

Blow-tubes and darts. [Centre Case A.] The blow-tube resembles a very large pea-shooter, and is used for discharging poisoned darts. The specimens shown represent the three types of blow-tubes : (1) a slender hollow reed, pro-

tected by an outer tube (specimens from South America, and the Semang of the Malay Peninsula); (2) two grooved halves bound together (specimen from South America); (3) a rod bored from end to end (specimens from Borneo). The modern English walking-stick blow-tube essentially resembles type 3. Darts and quivers are also shown, and in the same case are specimens illustrating the poisoning of arrows and darts by the Ainu of Japan, and in Borneo.

Cutting Weapons.

[Centre Cases.]

Battle-axes and war-picks: *stone-bladed* from Australia, New Caledonia, Bolivia; European *Palæolithic* and *Neolithic* stone implements, and *Bronze Age* axe-heads for comparison; *iron and steel-bladed* axes from Africa, Assam, Philippine Islands, India, etc

Daggers of *wood, bone, stone, horn, and metal*, from Australia, New Guinea, Admiralty Islands, India; Malay *krises*, Indian *katars*, and *baghnak* or tiger's claws (a weapon of treachery).

Throwing-knives from Africa (Kordofan, Darfung, Sudan, Belgian Congo, Gaboon); Sikh *chakra* or war-quoits, India.

Knives: bamboo beheading knife, British New Guinea; sharks' teeth knife, Gilbert Islands; knives and sword-knives from Africa (*see also* next paragraph).

Sword-knives and swords: Mandingo swords, West Africa; *shotel* of Abyssinia; *parang* of Borneo; *dao* of Assam; *dha* of Burma; Gurkha *kukri*; *kora* of Nepal; Khyber knife, Punjab; *tulwar*, *khanda*, and *pata*, of India; Turkish *yataghan* and *scimitar*; Sinhalese, Tibetan, Chinese, Japanese, and old English and European swords.

Fire Arms.

[Wall Cases 17 to 19 and Centre Case.]

Cannon: a few specimens and models, including a 14th century English cannon dredged up at Spithead.

Guns, rifles, etc.: *Match-locks* from Africa, India, China, Japan. *Wheel-lock*, German, dated 1652. *Flint-locks*, Moorish, Old English (including flint-lock blunderbuss, a double-barrelled flint-lock, and one with seven barrels). *Tube-ignition* gun, double-barrelled, Lancaster, London, about

1825 (a forerunner of the percussion gun). *Percussion guns*, *Enfield rifle*, 1855, and others. *Breech-loaders* and *magazine rifles*, *Snider* (taken at Benin), *Remington*, *Winchester* repeating rifle, French *chassepot*, *Martini Henri*; German *Mausers* used in the Great War, and a German *machine gun*.

Pistols : Chinese pistol for "*match*" (no lock), *flint-locks*, *percussion*, early *revolvers*, *Colt's revolvers*, *pin-fire revolvers*, etc.

Weapons of Defence and Body Armour.

Parrying sticks and shields: Australian parrying stick and [Wall Cases.] wooden shields; shields from the Western Pacific (wood, reeds), Africa (hide), Assam, India (hide, metal). Antelope-horn parrying dagger, and another with small circular shield attached, India. German sniper's shield, 1918.

Armour : suit of coconut-fibre armour from Gilbert [Wall Cases, and exposed.] Islands in the Pacific, used as a protection against sharks' teeth weapons. Japanese armour, 17th century. A shirt of chain mail, India. Armour of man-at-arms, Henry VIII. period. Armour of cavalier, Charles I. period. Reproduction of fluted plate armour (man and horse), German, period 16th century. German body armour, 1918. *Helmets*, including one of anteater scales, Kayans of Borneo; of basket-work (one with bearskin cover), Nagas of Assam; horseman's cap of quilted cotton, Sudan; Indian and Persian steel helmets; old Japanese helmet and face mask; German cabasset and morion, 16th century; English burgonet, 17th century; modern shrapnel helmet (English, 1917) with chain visor to protect the eyes from splinters; German steel helmet, 1918.

Hunting and Fishing Weapons and Appliances.

[Wall Cases 20 to 26 and Table Case.]

Blunt arrows, for killing small game without spoiling fur or plumage, from British New Guinea, South America, Burma, India, China.

Spears and arrows with two or more points, in most cases used for killing fish, from Oceania, Alaska, Guiana, Montenegro, England; Eskimo bird-spears; Fijian arrows for shooting the flying-fox.

Harpoons and harpoon-arrows, from Guiana, Tierra del Fuego, Alaska, Greenland, Baffinland, Central Africa, Andaman Islands, etc. Model of Eskimo kayak, with harpoons, spear-thrower, etc., West Greenland.

Fish-hooks, baits, and floats: thorn gorges, Essex coast ; [Table Case.] float, line, and gorge (of turtle-shell), Santa Cruz Islands ; halibut hook and others from the north-west coast of North America ; hooks of wood, mother-of-pearl, bone, turtle-shell, etc., from Oceania (no bait is needed for most of these hooks) ; whalebone line with hooks on rod, Eskimo of Alaska ; bronze hook, Swiss Lake dwellings ; brass hooks, Malay Peninsula and Borneo ; iron hooks, Africa ; examples of English hooks and artificial baits ; hook with crab-shell guard and stone sinker, Galway. Cuttlefish baits, Tonga Islands.

Snares and decoys : bird-snare, Maori of New Zealand ; [Wall Cases 22A.] squirrel-snare, Alaska ; rat-trap, Kasai, Congo ; deer-call, Ainu of Japan ; pigeon-call, Borneo ; bird-snares, Syria and England, etc.

Fishing and other nets. *Hand nets*, British New Guinea, [Wall Cases 20 to 22.] one large and strong, for entangling wild pigs ; net with stone sinker, Bering Straits. *Cast net*, Malay Peninsula *Seines and Drag-nets*, British New Guinea, Malay Peninsula, Maldive Islands

Fish-traps, etc. *Fish-traps* of basket-work, British New Guinea, West Africa, Straits Settlements, Japan, Montenegro. Model of fish-trap set up on the shores of bays and rivers, British North Borneo. Model of Chinese on raft, *fishing with cormorants.*

Miscellaneous. *Shell-fish rake*, Naga of Assam ; *cockle-* [Wall Case 26.] *rake*, from near King's Lynn ; *clam-digger* of horn, north-west coast of North America ; *hooked grappling implement* and hide line, for hauling in dead seals, Bering Straits. *Clubs* used for killing animals, New Hebrides, Eskimo.

II. THE DOMESTIC ARTS.

The term Domestic Arts is here used in a wider sense than is customary, since it is taken to include not only such originally domestic activities as spinning, weaving, and pottery-making,

but also agriculture and fire-making. The arrangement is a convenient one, however, since it brings together most of the essential arts of life, especially those relating to the growing, procuring, storing, and preparation of plant food, and the treatment or manufacture of materials for clothing.

In addition to the various series properly included in this section, several cases are devoted to the arts and crafts of the Andamanese. The Museum is fortunate in possessing a practically complete collection* of the objects made or used by this very interesting people, whose implements and artificial productions are so few and so primitive that it seemed advisable to keep them together as an illustration of the simplicity of life amongst a backward race. The collection may be regarded as an index collection to the Ethnological division of the Museum. For a fuller account of the subjects included in this section, see the Handbook to the Domestic Arts (in two parts).

Arts and Crafts of the Andamanese.

[Wall Cases 26A to 26F.]

The native inhabitants of the Andaman Islands, which lie in the Bay of Bengal, west of the coast of Burma, belong to the Negrito branch of the negroid peoples. In stature they are pygmies, the average height being about 4 ft. 10 in.; in colour they are very dark brown to black, and they have short black woolly hair. The Andamanese afford us many interesting examples of the utilisation of natural objects, with little or no adaptation. Amongst such objects may be mentioned the pebble used as a hammer-stone, and the flat piece of rock as a **grindstone**; *Cyrena* and other **shells** for scraping, sharpening etc.; **boars' tusks** for cutting, scraping, carving; **Pinna shells** for plates and **Nautilus shells** for drinking cups. Out of bamboo are made **knives, tongs,** and **water vessels.** Shell was formerly much used for cutting and piercing, but it has been displaced by iron obtained from outside sources. The shell-bladed (now iron-bladed) **adze** was used for digging graves, as well as for hollowing-out canoes. In the manufacture of **string**

* The Protheroe collection, presented by the Libraries Committee of the Lewisham Metropolitan Borough Council. To this has been added a number of specimens collected and presented by Mr. A. R. Brown.

and **rope**, of **mats** and **baskets**, and of **pottery**, the Andamanese show some progress in the domestic arts, but they do not spin or weave. Their weapons are less primitive than their tools, since the **bow** and the **harpoon** are both in use. **Arrows** were formerly pointed with wood, shell, or a spine of the sting-ray, but iron points are now usual. Agriculture is not practised, but a pointed **digging-stick** is used for obtaining wild yams. They have at present no means of making fire, and they take care to be always provided with burning wood in the form of a fire, a torch, or a smouldering log. Clothing can scarcely be said to be worn, though **painting** of the skin is practised, and various **necklets, armlets, girdles,** and **fringes** are worn. Dwellings are simple huts or sometimes mere leaf-screens. The **canoes** are dug-outs, with or without an outrigger. There is no recognised form of currency and no regular system of barter. The only **musical instrument** is a curved board, which is beaten with the foot to keep time for dancing.

Agriculture and Preparation of Food.

[Wall Cases 27 to 29, 42 to 44, etc.]

Man's earliest vegetable foods, such as fruits and nuts, were obtained by the mere labour of plucking, and the grubbing up of roots and tubers probably came later. The intentional preservation of food-plants led by degrees to planting-out and the sowing of seed, and North America and Oceania afford several examples of early steps in this direction. Especially important is the utilisation of the wild rice of swamps in parts of North America. In most instances the grain is threshed from the plant into a boat, the only preparation being the tying up of the ears into bunches before the grain is ripe. Some tribes, however, sow quantities of the grain in favourable situations. Some such step must have been taken in the history of the cultivation of the cereals of the Old World. Wheat, barley, and millet were already known in Europe in the Later Stone Age. Agriculture on any considerable scale is dependent upon such cereals, and it is in connection with them that the greater number of agricultural appliances have been evolved. The simple pointed digging-stick is no doubt of considerable antiquity, and it has had a wide dis-

tribution in recent times ; it is used even by peoples such as the Andamanese (see above), who do not practice any agriculture. The pick, and still more the hoe, is a great improvement on the straight digging-stick in preparing patches for planting or sowing, the hoe being found in most parts of the world. At an early period, in the Old World, it gave place to the simple plough, which is merely a larger hoe, with a handle for the ploughman, and a longer haft for attachment to a draught animal. Special knives, or sickles, for reaping cereals, were produced in the Stone Age, and these gave rise to the bronze and iron sickles of later times. For threshing some kinds of grain a straight stick suffices, but the jointed flail is more efficient. In the case of rice the pestle and mortar are sometimes employed to separate the grain from the husk. Other primitive methods of threshing are treading out the grain, or driving cattle over it, or the use of the tribulum.

The triturating of the grain is performed by pestles and mortars, or by some form of stone grinder. The rounded stone rubbed upon the fixed rock was probably the beginning of both series. The immediate origin of the quern, or rotary handmill, is obscure, but it has certainly given rise to the millstones of the older types of corn-mill.

Digging-sticks from New Guinea, New Zealand (with foot rest), the Andaman Islands, and South America (Lengua Indians). Spade-shaped implement with shell-blade (used for cutting up certain foods), Fiji Islands. An Irish **spade** with foot-rests on one side. Old English spade of wood shod with iron. Old English wheat dibs for making holes for the seed, a purpose also served in some regions by the digging-stick.

Picks and hoes : picks or hoes of one piece of wood, Africa. Hoes from British New Guinea (shell-bladed), ancient Egypt, Africa, Ceylon, India, Japan, Montenegro, England. Hoe-blades of wood, stone, and shell from Oceania and America. The ancient Egyptian hoe, made entirely of wood, is of special interest.

Ploughs (chiefly models) and ploughshares : simple types with ploughshare only, from Ceylon, India, Montenegro ; a model from Montenegro with coulter and mould-board.

An old English breast plough is shown in this case. Also some native wooden models from Ceylon, showing implements used in rice culture.

Reaping hooks, etc.: sickles (some with serrated edges) from Austria (Bronze Age), North Africa, Asia, Italy, Surrey, Huntingdonshire. **Padi-knives** from Borneo, for reaping rice, a handful of heads at a time.

Flails, from Japan (Ainu), and Lincolnshire.

Winnowing trays from the Maldive Islands and Japan (Ainu); winnowing **forks** from Ceylon and Montenegro.

Pestles and mortars, some for pounding corn, some for other purposes: pebble used for pounding grass-seed for food, New South Wales; wooden pounder for fern root, New Zealand; wooden food-pounders, Fiji; coral pounder for taro root, Austral Islands (East Pacific); stone pestles and mortars, and a hide tray with stone-headed pounder (for fish), north-west coast of North America; ivory pestle, Belgian Congo; wooden pestles and mortars, North America, and Dahomey (West Africa); wooden pestle and mortar for coffee, Algiers; pestle for threshing rice in a mortar, Travancore, India; model of pestle and mortar for working with the foot, Malay Peninsula; alabaster pestle and mortar, ancient Cyprus; Old English bronze and iron pestles and mortars; wooden pestle and mortar for making snuff, Alaska; small pestles and mortars for areca (betel) nut, British New Guinea and Ceylon.

Corn-grinders: [Centre Case.] hand-stone for grinding grain, South Africa; ancient hand-mills from Java and Palestine; **querns** from Ireland, England (early historic period), Egypt, Ceylon (shown below case), and India. Model of **water-mill** with horizontal wheel, Montenegro.

Miscellaneous. [Case 44D.] Basket-press for cassava, Guiana. Sago pounder and strainer, British New Guinea. Sifting basket for manioc flour, Kwilu, Congo. Axe-shaped implement with turtle-bone blade, for slicing pounded bread-fruit and taro, Matty Island (West Pacific). Wooden chopping-block for fish, Ainu of Japan. Wooden hook for hanging up food, Fiji Islands.

Fire-Making.

[Table Case.]

All existing races make use of fire, and the Andamanese alone are known to be ignorant of any method of producing it. Wood friction (fire-sticks) and the percussion of certain minerals are the chief methods employed by backward races.

Fire-sticks. There are three principal ways in which friction between two pieces of wood may be brought about in the process of fire-making. In each case, the friction not only generates heat, but also produces wood-dust or scrapings, which serve as the first fuel for the nascent fire. By boring or *drilling* one piece of wood into another, by rubbing or *ploughing* along the grain, and by *sawing* across the grain, fire may be produced. One or more of these methods is employed by backward races all over the world, and in regions now civilised the same appliances were once used. There are shown :—

Two-stick fire-drills from Australia, North and South America, Africa, Borneo, Maldive Islands, India.

Thong-drill for fire-making, Eskimo of Alaska.

Bow-drill for fire-making, Eskimo of Alaska.

Fire-plough, British New Guinea.

Fire-saw from the Philippine Islands (model).

Fire-strap of the Tapiro pygmies of Dutch New Guinea.

Flint and steel. The flint and steel date from prehistoric times in Europe and persisted in use up to about 60 years ago. They are still in general use in many parts of the world, and are not entirely obsolete even in Europe. Specimens are shown from Borneo, India, Tibet, China, Japan. In some of the examples from India, Tibet, and China, the steel is fixed to a purse which contains flint and tinder. Several old English tinder-boxes are shown, including pistol tinder-boxes, in which the flint strikes a steel plate when the trigger is pulled. The dainty nut-shaped tinder-boxes from Japan have a similar mechanism.

Fire-pistons from Borneo and Burma (Kachin) ; in this appliance tinder is ignited by the sudden compression of air in a closed cylinder.

Lenses. An old English tobacco box with lens in the lid is shown.

Matches. The evolution of matches through the various early chemical methods of making fire is not at present represented. Several examples of early matches (date about 1840–1850) are exhibited.

Natural and Artificial Vessels.

[Centre Cases.]

The first vessels used by man were no doubt natural receptacles such as shells and coconut shells. Sections of bamboo, and the horns and skins of animals, require a little more preparation, whilst vessels of wood and stone are only of natural origin as regards the materials of which they are made. Baskets and earthenware pots were no doubt of relatively late date, and glass vessels are scarcely known outside civilisation. The Museum collection contains representatives of all the above-mentioned classes of vessels, in each case chosen from as wide an area as possible. Metal vessels are at present excluded.

Gourd vessels (often called " calabashes ") from Oceania, S. America, Africa, Burma. The specimens from New Caledonia (West Pacific), with protective net of coconut-fibre string, are worthy of notice.

Palm-leaf vessel for water, British New Guinea.

Coconut vessels from Oceania, Africa, Maldive Islands, Ceylon, Japan. Some are enclosed in a suspending net of string or sinnet.

Bamboo vessels from Sumatra and Burma.

Shell vessels (the shell of *Cymbium*) for cooking, from Torres Straits Islands (between Australia and New Guinea).

Horn vessels : ox-horn cups, South Africa and Argentina, and an Anglo-Saxon specimen, found in London ; horn ladles, Haida Indians of North America ; Chinese, modern Mexican, and old English horn beakers or mugs.

Skin vessels : goat-skin water-bag, Cairo ; walrus-bladder bucket, Siberia ; Spanish peasant's skin bag for wine or water ; hide bottle for cuscus, Kabyles of Algeria ; cylinders of wood and hide, East Central Africa ; hide bottle, Hausa of Northern Nigeria ; old English " black-jacks " and " leather bottels."

Bark vessels : bark trough, Australia ; bark dish for fish, Ainu of Japan ; birch-bark tray, North American Indians.

Wooden vessels. (1) *Carved in one piece* : from Australia, the Pacific Islands, North America, Africa, Philippine Islands, Japan (Ainu) ; Old English platter, and Old Norwegian beer bowls. (2) *Built up of several pieces* : cedar wood boxes, north-west North America ; wooden bucket made of two pieces, Eskimo of Alaska ; Old English harvest barrels, old Norwegian tankards.

Stone vessels. Soapstone " kettle," Eskimo of Labrador ; slate bowl and alabaster vase, Ancient Egypt ; stone mug, India.

Basketry.

[Centre Case E.]

The origin of basketry is unknown, but in technique it is related to mat-making and weaving. There are two chief methods by which baskets are made—by a kind of hand-weaving, and by coiling and sewing. Some North American Indians were especially skilled in the production of fine baskets, and so also are some African tribes. The baskets of civilised peoples are usually much inferior to those of less advanced races. Baskets may be so closely woven, or sewn, as the case may be, that they are used to hold water, or even for cooking food by the " stone-boiling " method. No account of methods of technique can be given here, but the subject is treated in some detail in the handbook already referred to.

Woven baskets from practically all parts of the world, arranged under the following headings : *wicker work*, *chequer work*, *twilled work*, *twined work*, *wrapped work*, *wrapped-twined work*. The twined basketry from North America is especially noteworthy.

Coiled baskets from practically all parts of the world ; water-tight coiled baskets from various parts of Africa, and from the north-west coast of North America.

Pottery.

[Centre Cases.]

Amongst backward races pottery is shaped by hand without the use of the wheel, and there are three chief methods

of giving to the plastic clay the shape of the future pot. In *moulding*, the clay is plastered on the outside or inside of a gourd, basket, or other mould ; this is the least usual method, though it may have been an early one. In *modelling*, the shape is determined by freehand manipulation of the clay. In *coiling*, the clay is used in the form of strips or bands which are coiled upon each other in an ascending spiral, and pressed together as the work proceeds. The finished pots rarely show any indication of the method by which they have been built up. The use of rings of clay (*see* specimens from East Africa) is, perhaps, a modification of the coiling method.

In several parts of the world the potter's wheel is foreshadowed by the use of a stone or other support which can be turned round during the shaping of the pot ; such supports are, however, merely conveniences by means of which all sides of the embryo pot can be brought under the hands of the maker in turn. In the case of the wheel itself, which occurs in various forms, the circular shape of the vessel is due to pressure exercised by the potter on the wet clay whilst the wheel is in rapid rotation. The potter's wheel is, like the plough and the quern, purely an Old World appliance, and it was in use in Ancient Egypt, Assyria, Greece, and Rome. Most of the pottery of Europe, Asia, and North Africa, is wheel-made, though other methods, such as moulding and casting, may be employed, even where the wheel is in regular use.

In its widest sense, the term pottery may be taken to include earthenware, stoneware, and porcelain. All the hand-made pottery of the backward races is earthenware, usually made from the natural clay of the district, and often without any glaze or ornamentation. A layer of varnish of vegetable origin is sometimes applied, or the surface may be coated with a wash or " slip " of finer clay, and then polished and painted, or the slip itself may be coloured ; but true mineral glazes, fused by heat, are practically confined to the potters of civilised countries.

Some methods of finishing and ornamenting pottery are common to the two classes of hand-made and wheel-made vessels, but the use of mineral glazes and enamels,

coloured or uncoloured, gives far greater opportunities to the civilised potter, who also profits by the methods of producing artificial clays by mixing suitable materials. Porcelain, in particular, is made from substances which produce a hard, white, translucent kind of pottery, and some fine stonewares may approach porcelain in these properties. Even the common white earthenware now in such general use, is the result of many years of trial and experiment, especially during the 18th century. It was in this century that the desire to make pottery similar in appearance to the introduced Chinese porcelain, led to the great development of ceramics in Europe, and it was at this period also that the making of pottery and porcelain in our own country reached its highest artistic level.

An Index Series (in the octagonal case) illustrates by means of a few selected specimens, the chief methods of finishing and decorating hand-made and wheel-made pottery respectively. For details reference must be made to the exhibits, but attention may here be drawn to the fact that the colour of pottery made from ordinary natural clays depends mainly upon the quantity of iron oxides in the clays, and upon the action of the fire on these oxides when the pottery is baked. A fire supplied with abundance of air tends to produce red pottery, since the oxygen of the air combines with the iron in the clay to form red oxides. On the other hand, if the firing is done with a scanty supply of air, the shortage of oxygen has a reducing action, and the iron is left in the form of black oxides. Pottery from common clay may be red, brown, or of a nondescript colour, according to the amount of iron in the clay, and the state of its oxidation after firing. Black pottery is also produced in a reducing and smoky fire, but in this case there is a deposit of carbon, which is capable of taking a high polish. It is, of course, chiefly in hand-made pottery that finish and decoration depend upon such natural and simple factors as those just described, but the ancient potters of the Mediterranean civilisations knew how to utilise the iron in their clays for decorative purposes.

It should be particularly noted that the Museum collection of pottery does not purport to be one which can be of service

to the collector for the identification of specimens. It is intended to illustrate the kinds of pottery made and used by races in various stages of culture, in the past and in the present, and thus to throw light upon the general course of evolution of the ceramic art.

Hand-made pottery from Oceania, Alaska, Mexico, Ecuador, Bolivia, Peru (ancient and modern), prehistoric Egypt and Cyprus, modern Africa, Perak (Malay Peninsula).

Wheel-made pottery : from *Ancient Cyprus* and *Greece.*

Roman and Romano-British pottery : examples of Castor, Wilderspool, Upchurch, and " Samian " ware ; Roman amphoræ.

Mediœval and Old English pottery : pilgrim bottles, pitchers, jugs, tygs, pipkins, ointment pots, etc., from the 14th to the 17th century. Stoneware and Delft. Examples of the much more highly developed pottery of the 18th century (including salt-glaze, creamware, jasperware, etc.).

Oriental porcelain : a few examples of Chinese porcelain, especially blue and white.

European porcelain : a few examples of Old English porcelain.

Glass Vessels.

Glass is entirely a product of civilisation. In its early stages it was made into small bottles for holding unguents and cosmetics, and domestic utensils came later. The specimens exhibited are restricted to ancient " Phœnician " glass from Tyre, Mount Carmel, and Cyprus, dating from about the beginning of the Christian era and made under Roman influence. Old English wine bottles and some examples of other forms will be found in the exhibit of old English objects (see p. 91.)

Thongs, Cord, etc.

Thongs, rope, and string : examples of hide thongs, ropes of rattan, bamboo, bark, etc. ; rope and string of sinew and hair. Specimens illustrating stages in the manufacture of sinew string by the Eskimo of Alaska, and of coconut-fibre braid (sinnet) from Oceania.

[Wall Case 30.]

Spinning.

[Wall Cases 31, 32.]

The use of a spindle for twisting animal or vegetable fibres into yarn is widespread, and the appliance was known in Europe as early as the Later Stone Age. Spinning-wheels, which are Old-World inventions, are of much later origin, and in their simplest forms they consist of a spindle fixed horizontally in bearings, and turned by means of a wheel. This is the case with the spinning-wheel of India and the East, and the "muckle" or large wheel of Scotland, known in Europe as early as the 15th century and not yet obsolete. The small, or Saxon wheel, is a later invention, and is of more complex construction. In modern spinning machines a large number of spindles are at work at once, but the principle is the same as in the simplest forms of spinning appliance. The specimens exhibited include :—

Spindles: from Mexico, with stone whorl, fibre, and yarn ; Paraguay (Lengua Indians) with gourd whorl ; India, with clay whorl ; Egypt, with wool (from a black sheep) being spun into yarn ; Montenegro, Dalmatia, and the Pyrenees (with distaff, fibre, and yarn), the spindles shaped and without separate whorls.

Spinning-wheels from France, Germany, and Roumania ; a two-handed wheel from Brechin, Scotland. These are all of the Saxon wheel type, and there is at present no example of the other form in the Museum.

Parts of spinning machines : steel spindles for "mule-spinning" and "ring-spinning" respectively. "Cops" of yarn.

Mat-making.

[Wall Cases 33 and 34.]

Mat-making is allied on the one hand to basket-making, and on the other to weaving. There is a considerable variety of technique, and the main types are illustrated in the case.

Mats. *Sewn* mats from British New Guinea and North America. *Chequer and twilled work* : examples from New Hebrides, Samoa, Maldive Islands, North America, West Africa. *Twined-work* : examples from New Zealand, An-

daman Islands, Japan (Ainu), North America (Haida Indians, with painted design), South Africa ; when the materials are soft, mats of this class are sometimes spoken of as " tied cloth."

Weaving.

[Wall Cases 35 to 38.]

Mats may be made with the fingers alone, or with the aid of needles, and in some cases a frame is used for stretching the warp. True weaving involves the use of a loom, the characteristic feature of which is an arrangement for shifting the warp strands in sets, in order to make the " sheds " for the passage of the weft. Apart from modern inventions, there are two chief types of loom ; the more primitive of these has a widespread distribution, though it is only used by the less advanced races. In this type the warp strands (or a number of them) are shifted by means of loops of thread, attached to a wooden rod, the arrangement forming a kind of heald or heddle. The second type of loom, having true healds, is of much later origin, and is still in use. It is probably an Old-World invention, though it has been adopted by some native tribes in Africa and America.

Looms : *with rod and loops* :—North America (Navaho Indians), Santa Cruz Islands, West Africa, Borneo (Iban or Sea Dyaks of Sarawak), Japan (Ainu) ; some examples of cloth woven on such looms. *With true healds* :—a model from Montenegro ; model of a silk-weaving loom from Lancashire and another showing warping-mill and other parts ; a West African loom of the same type, but of primitive construction, for weaving " grass-cloth " ; some examples of woven cloth.

Weavers' swords from West Africa and **shuttles** from Borneo and Lancashire. (See also the complete looms.)

Skin-dressing.

[Wall Case 39.]

The dressing of skins for clothing and other purposes is an industry of great antiquity, and there is evidence that it was practised in Europe as early as the Old Stone Age. The art is by no means extinct amongst backward races of to-day,

in tropical as well as in cold and temperate climates. The tools required are few and simple, since the removal of superfluous fat and flesh from the skin is the chief process for which implements are needed. The stone scraper is the best known type of these tools, but other forms are used.

Scrapers, etc. : stone scrapers, Palæolithic and Neolithic, England ; stone-bladed scraper, and a mammoth-ivory scraper, North-east Siberia ; slate-bladed scraper, Eskimo of Bering Straits ; bone scraper, Eskimo of Labrador. Implement with iron points for producing a " nap " on dressed skins South Africa.

Specimens illustrating the uses of **skin** and **leather.** Only a very small selection can be shown. Eskimo sealskin coat and reindeer-hide boots, Alaska ; ox-hide cloak with " nap," South Africa ; boy's deerskin coat, Indians of North America ; hide sandals, Uganda Protectorate ; hide bag or *parflèche,* Yakimo Indians, North America ; leather bags, West Africa ; hide shoes, Shetland Islands and Montenegro ; other objects of skin, hide, and leather will be found amongst the food-vessels, clothing, etc.

Bark-cloth.

[Wall Cases 40 and 41.]

Bark-cloth is a kind of natural textile prepared from the bast or inner bark of various trees. It is suitable for use as clothing in warm and dry climates, and is also employed for other purposes. Bark-cloth is made in several parts of the world, including the islands of the Pacific, South America, Africa, and parts of Asia ; in the Pacific region it is a very characteristic product. The general method of manufacture is similar in all regions. The bark is subjected to beating with mallets, by which process it is given a firm, strong texture. The implements vary in the different regions, but the mallets are usually short wooden clubs (sometimes ivory or stone) with grooves on one or more sides. In the Pacific especially the bark-cloth, here called *tapa* or *kapa,* is often decorated with designs, either painted or printed.

Bark-cloth from the Pacific Islands, South America, Uganda, Belgian Congo, Borneo.

Bark-beaters from the Pacific Islands, Central America, Dahomey (West Africa) and the Belgian Congo ; two from the last-named region are in the form of hammers. The small table or bench from Dahomey is for use during the process of beating.

Printing blocks for tapa, from the Fiji Islands, one a carved board, and the other a grooved bamboo roller ; palm-leaf tapa stamp from Samoa.

String Work, etc.

[Table Case.]

String-work bags from British New Guinea, Paraguay (Lengua and Caingua Indians), and Africa.

Netting-shuttles from the Pacific, Japan (Ainu), Alaska, British Columbia, West of Ireland. The close similarity of the shuttles from all these regions is noteworthy. Old English tatting shuttle and modern sample of tatting.

Mesh-gauges from British New Guinea and Alaska.

Awls and Needles : bone awls from Swiss Lake Dwellings (prehistoric) ; iron awls from South Africa and Borneo. Pieces of bone needles from French caves (Old Stone Age) ; needles of bat's bones, British New Guinea ; human bone needles from the Fiji Islands ; ivory needles, Eskimo of Alaska ; long cedar-wood needle for mat-making, north-west North America ; ivory case and needles, China ; modern bone needles, London and Paris.

III. REPRESENTATIVE AND DECORATIVE ART.

Representative Art.

[Table Cases.]

It is probable that carving, engraving, and painting were originally representative in intention. The oldest known examples of such art are from the caves of central and southern France and northern Spain ; they date from a period of remote antiquity, having been executed during the Cave Period of the Palæolithic or Old Stone Age. The men of this period were hunters and fishermen, and they made carvings in bone and ivory, chiefly of animals which they used for food. It has been suggested that the first such works of art were

carvings in the round, and that carvings in relief and engravings were of later origin. These forms of technique all occur in the Cave Period, and paintings and engravings of high artistic merit were made on the walls and ceilings of the caves.

Resemblances to the carvings of the Cave Period are found in the small sculptures and engravings, chiefly in ivory, made by the Eskimo of the Arctic regions, whilst the rock-paintings of the Bushmen of South Africa are comparable with those of the Cave Period. These similarities have led to theories being put forward as to an actual relationship between the modern Eskimo and Bushmen, and certain races of the Cave Period.

In addition to carving single figures in the round, the Eskimo incise or engrave figures and scenes upon walrus tusks, pipe-stems, and other objects. As a rule, hunting scenes are figured, and in some cases at least the picture may be regarded as a record of actual events, and therefore as an early stage in pictography.

The Bushmen also represented scenes as well as single figures, and in this respect both Bushmen and Eskimo are in advance of the cave-men of prehistoric Europe, who appear to have rarely got beyond the representing of groups of animals.

The art of the aborigines of Australia was more crude in character than that of either Bushmen or Eskimo, but attempts at pictorial representations have been found, in the form of rock drawings and chippings, in some regions.

It is noteworthy that such a high degree of skill in representative art has been developed by hunting races, and especially by those who live, or lived, in open country. Races which combine hunting with other activities, such as agriculture, may also have considerable artistic skill, but it is usually associated with the use of patterns and designs which are often highly conventionalised.

The art of hunting races is represented in the Museum by specimens, casts, and pictures of the carvings, engravings, and paintings of the races referred to above.

The Art of the Cave Men (Palæolithic Age in Europe). *Casts of carvings and engravings* : the originals are mainly in

bone, reindeer-antler, and ivory, and are in the British Museum and elsewhere. Most of them were found in the caves of Dordogne, France. The animals represented are the mammoth, horse, bison, reindeer, deer, etc. Small statuettes of women were also carved. Geometrical designs are rare. *Pictures of paintings and engravings* of mammoth, bison, reindeer, etc., on the walls of caves in France and Spain.

The Art of the Eskimo. Ivory toggles in the form of seals; ivory models of seal hunters in their kayaks; pipe engraved with hunting scenes (Alaska); walrus tusks engraved with hunting and other scenes, Siberia and Bering Straits.

The Art of the Bushmen (South Africa). *Pictures of paintings and rock-chippings,* showing single animals and events of native life.

Australia. At present there are no examples shown of the naturalistic art of Australia. The decorative designs of the aborigines are simple in character, though they are not so meaningless as they may appear to us. Some of them represent the skin markings of animals, or even their internal parts. Others, such as those carved on *churingas* (see p. 57), have more complex explanations. The specimens shown include shields, clubs, boomerangs, spear-throwers, and *churingas.* One of the clubs is carved with the representation of a kangaroo.

Evolution in Decorative Art.

[Centre Case.]

The practice of decorating objects such as weapons, canoes, houses, garments, with ornamental designs, is so widespread as to be practically universal. Amongst backward races, such decoration is sometimes realistic, but more usually the designs are conventional, though they may often be traced to the modification of representations of natural objects, or to the copying of patterns produced by technique. Many patterns and designs show practically no traces of their origin, but a careful comparison of a number of decorated objects from the same region may afford the necessary clues, and the natives themselves can sometimes explain the meaning and origin of the designs.

Many patterns have arisen from the copying of the texture of basket-work, mats, and string bindings, whilst the nature of coarse textiles such as baskets, influences the character of designs worked in them, and such modified designs are copied in other kinds of work. Human, animal, or plant forms may begin as realistic carvings or paintings, but by constant copying the distinctive features of the figures may be lost sight of, and the animal or man (single or in series) may " degenerate " into a geometrical pattern. These and other modes of origin of designs and patterns are illustrated in the case.

Origin of ornament and patterns by suggestion.

1. Japanese arrows showing the addition of decorative markings suggested by the natural structure of the reed shaft. Piece of a London cabdriver's whip, with markings of similar origin.

2. Solomon Island arrows with decorative patterns, derived originally from appearances resulting incidentally from the treatment of reed shafts during the trimming and smoothing processes.

Origin of patterns from textiles, etc.

3. Clubs, etc., from the Pacific (Fiji and Tonga Islands) carved with patterns derived from the appearances presented by lashings or bindings of string and sinnet.

4. Wooden bowls, earthenware pots, etc., from Africa and the Pacific Islands, gourd from Hawaii, showing patterns based on the appearance of basket-work and plaiting.

Influence of textiles on designs.

5. Baskets and textiles from the Pacific and South America, illustrating the effect of the nature of the fabric upon the curves of the designs worked in the material.

6. Bark-cloth from the Pacific, showing designs without curves, though there is usually nothing in the method of production of the designs to interfere with the formation of curves. The designs were probably developed in a technique, such as mat-making, which tends to angularise curves.

Degeneration of human and animal figures.

7. Bird and crocodile design on paddles, etc., from south-east British New Guinea.

8. Crocodile design on arrows from the Torres Straits Islands, British New Guinea.

9. Human figure designs on wooden lime spatulas from the Trobriand Islands, British New Guinea.

10. Human figure designs on spears from the Solomon Islands.

11. Toad designs on lamps of the Roman period, Bubastis, Egypt.

12. Human figure designs (repetitional) on adzes and paddles from the Hervey Islands.

13. Human face designs (repetitional) on bark body-belts from the Papuan Gulf, British New Guinea.

14. Bird-scroll designs on clubs and lime spatulas from south-east British New Guinea.

Origin of form of vessels, etc.

[Small Centre case.]

15. Examples of earthenware, porcelain, wood and metal vessels, from various parts of the world, in which the forms of gourds have been copied; earthenware pot copied from alabaster vessel, Ancient Egypt, Dynasty I.; human skull drum and copies in wood and metal, Tibet; porcelain vase copied from bamboo, Japan; stoneware beer-mug imitating the form of one in wood, Leipzig.

The Decorative Art of Selected Regions.

Melanesia. [Wall Cases 48 to 50.] The Melanesians occupy the islands of the Western Pacific from Fiji and New Caledonia to the Admiralty Islands and New Guinea. They are negroid in their physical characters, having dark skin, woolly (or frizzly) hair, and broad noses. Decorative art is extremely well developed in some of the islands, especially in New Guinea and the Solomons. Men, birds, and fishes are most frequently represented, and a number of patterns have been developed from such designs. Most of the specimens shown here are from the Solomon Islands, the decorative art of British New Guinea* being chosen for special treatment (see below).

Solomon Islands.—Paddles and dancing sticks, carved and painted with human figures and faces; bamboo lime-boxes;

* Exclusive of the now British "German" New Guinea

canoe ornament, the upper part of a human figure in wood; wooden food bowls; shield; paddles; shell and turtle-shell forehead ornaments; plaited work with designs; etc.

Santa Cruz.—Clubs with painted designs, and decorated woven bag.

Admiralty Islands.—Wooden food bowl, lime gourds, etc.

"*German*" *New Guinea.*—Wooden head-rest carved with lizards and human faces, paddle, food bowl, head-rest, etc.

British New Guinea. [Wall Cases 51 to 56.] The natives of British New Guinea (Papua) are of negroid type, as a whole, but marked differences in physical and other characteristics are to be found in different regions. Those of the western area are chiefly Papuans (an aboriginal stock), in the east the immigrant Melanesians predominate, and a mixture of the two stocks has occurred in varying proportions in many areas. In certain parts, also, a Negrito (pygmy) element is present.

Several distinct districts may be defined by well-marked differences, not only in the decorative art, but in customs, in implements, and in the forms of houses and canoes. These differences may certainly be attributed in the main to racial movements and intermixture. The decorative art of British New Guinea is of great value in demonstrating the importance of the study of the artistic methods and products of backward peoples, as an aid in anthropological enquiry. Speaking generally, designs and patterns would appear to have passed on from generation to generation with almost as much certainty as physical characteristics, though the range of variation is much greater.

The districts given below are selected as presenting contrasting styles of decorative designs, but the specimens shown are by no means fully representative of the art of British New Guinea, much less of the whole of New Guinea.

1. *Western district* (Torres Straits islands, and Daudai on the mainland). Representations of animal forms are frequent in Torres Straits, whilst plant forms are rare; this is due to the fact that here the natives have many animal and only two plant totems. Patterns are mainly of straight lines, zigzags, chevrons, simple curved lines, etc. The designs

on bamboo pipes are engraved in fine zigzags or punctate lines. There are shown in the case, drums, pipes, combs, arrows, etc., but, unfortunately, objects bearing animal designs are almost wanting in the collection.

In this, as in other parts of New Guinea, lime is frequently rubbed into the carved designs, in order to make them show up more conspicuously.

2. *The Middle Fly River district* is characterised by designs and patterns derived from plant forms, the totems of the natives being presumably plants. Patterns on pipes are made by partial removal of the skin of the bamboo. The Museum has at present no specimens from this district.

3. *Papuan Gulf district* (from Fly River to Cape Possession). Nearly all patterns derived from representations of the human face ; the natives practise an ancestor cult, and have a belief in gods. Designs are cut in flat relief on the bamboo pipes, and the intaglio portions are coloured dark red. The specimens shown include shields, drums, body belts, pipes, masks, bullroarers, coconut-shell spoons, etc.

4. *Central district* (from Cape Possession to Orangerie Bay). Patterns mainly of angular lines, and rectangular panels are frequent ; the natives are deficient in religious ideas. Gourds and bamboo pipes have burnt-in decoration. The origin and significance of the designs of this district are not known. Bamboo pipes, coconut-shell vessels, and a gourd are shown.

5. *The Eastern or Massim district* (south-east British New Guinea, with the neighbouring groups of islands). Curved lines, spirals, and concentric circles are freely used in decoration, and in most cases the patterns are derived from the representation of birds' heads in series (*see* Evolution in Art case). Various animals are frequently represented. The natives have bird and other animal totems. The specimens exhibited include shields, gourds, lime knives, clubs, paddles, canoe ornaments, etc., most of them with bird scroll designs.

Polynesia. [Wall Cases 57 to 59.] The Polynesians are the most highly cultured people of the Pacific, and decorative art had reached a high level before it fell into decay under the influence of an alien civilisation. The representa-

tive stage had been left behind, and most of the decorative art took the form of conventionalised designs, with which objects such as clubs or paddles were sometimes entirely covered. Some of these designs were derived from representations of the human figure, as in the case of many objects from the Hervey Islands (*see* Evolution in Art case), whilst others were based on imitation of string lashings or wrappings. The human figure was frequently represented, though usually with little attempt at realism. In New Zealand the Maori had evolved a very characteristic style of art, in which the spiral played a prominent part.

The chief specimens exhibited are from :—

High Island (*Austral group*) : paddles carved all over with human figure (*tiki-tiki*) pattern. At the ends of the handles the human figures are easily recognisable.

Mangaia (*Hervey Islands*) : ceremonial adzes with stone blades, the hafts carved with the *tiki-tiki* pattern ; fan with the handle similarly carved.

Marquesas Islands : chief's club of wood artificially blackened, with several human faces carved on the head ; stilt-rests with human figures carved on them ; fans, the handles carved with human figures.

Samoa and Tonga Islands : clubs with patterns carved all over, probably imitation of textiles.

New Zealand : a very fine wooden lintel (*korupe*) of doorway, with grotesque human figures, mythical bird-lizard, and spirals; model of canoe with carved prow and stern ; a canoe prow ; chief's staff (*hani*) carved all over*, and others with face and protruded tongue at end ; paddle with both sides of blade carved* ; paddle, blade painted one side ; carved wooden boxes for holding the feathers worn in the hair by chiefs ; jade *tikis*, or neck ornaments in the form of a misshapen human figure.

North America. [Wall Cases 45 to 47, 45A.]

North-west Coast.—The most interesting style of decorative art in North America is that of the Indians of the north-west coastal region. The chief tribes are the Haida, the Tlingit,

* The carving of a *hani* or paddle all over is a late development, arising from a desire to enhance the value of the object.

the Tsimshian, the Kwakiutl, and the Salish. The decorative art consists mainly in the representation of totemic* animals, birds, and mythical creatures, in most cases as carvings in wood, horn, ivory, and stone. Huge wooden posts (totem poles) were carved with such figures, representing a kind of genealogical tree, and erected in front of the dwellings. All the specimens shown have carved or painted designs of this character. They include a splendid example of the Chilkat blanket with totem design in brown, yellow, and blue; a painted paddle; seal-head rattle of wood; models of totem poles in wood, and one in slate; walrus tusk carved like a totem pole; slate pipe bowl; horn ladle with animal's head at end; carved and painted wooden food bowls; hat in twined basketry, with a painted design.

Quill-work and Bead-work of the Plains Indians.—The art of the Plains Indians is only represented by a small collection of objects decorated with dyed porcupine quills and beadwork respectively. The beads have, of course, only been used by the Indians since they came into contact with Europeans. The specimens include beadwork belts, buckskin tobacco pouches, moccasins, and a skin quiver, all decorated with beadwork; Cree Indian buckskin saddle decorated with porcupine quill work; skin pouches containing porcupine quills dyed ready for use. (These specimens are shown in Wall Case 45A.)

Africa. [Centre Case.] There are great differences in the artistic tendencies and skill of the natives of different parts of Africa, and it is therefore difficult to give any general account of the decorative art of the continent, even if only Negro and Bantu are considered. Speaking broadly, it may be said that although the purely representative stage has been left behind, carvings of men and animals are frequently produced. Patterns are also common, however, and some of these are of textile origin. The Bushongo of the Kasai district of the Belgian Congo, are probably more artistic than any other Bantu tribe. Other Congo tribes are more artistic than the Bantu further south, or the negroes of the west, except where the latter have profited by European teaching (*see* below).

* These representations are generally spoken of as totemic, and this term has been retained here. See, however, the statement on p. 57.

The Museum collection does not at present do justice to the decorative art of Africa, and by far the best portion of it comes from Benin, in the west, the natives of which (the Bini) had acquired the art of bronze casting, by the *cire perdue* process, as early as the 16th century. For this reason the decorative art of the continent is at present specially represented only by the Benin collection, though examples of carving and modelling will be found in various other sections of the Museum (fetish figures, food-bowls, pipes, etc.).

The Benin collection, obtained shortly after the town was destroyed by a British force in 1897, contains the following specimens :—a number of bronze panels with figures in high relief; small bronze pendants with animal figures; small pendants with human figures; brass mask with face showing tribal marks; brass fowl, bell, armlets, dancing wands; ivory armlets; ivory handles with human figure at end (? handles of fly-whisks); wooden comb; carved wooden frame; and other objects.

Borneo (chiefly Sarawak). [Wall Cases 60 to 62.] The decorative art of Borneo is more developed in style and technique than that of any of the regions so far considered. The population of the island is not a homogeneous one, however, and here, as in New Guinea, differences in the human stock are manifested in differences in the decorative art, as well as in other matters. In general, however, the people may be said to stand on the threshold of civilisation, and thus to occupy a position midway between such uncivilised peoples as the Melanesians or Bantu, and civilised Eastern peoples like the Burmese and Siamese. Most of the Museum specimens are from the Kenyah-Kayan tribes, and the Iban or Sea Dyaks of Sarawak. As will be seen, the decorative art includes carvings in wood, horn, and ivory, beadwork, designs woven in baskets and cloth, and engravings or inlayings in metal. The designs are often elaborate, and frequently fantastic to our eyes. Many of them are plant motives, but some of the most interesting have been shown to have been derived from representations of the dog.

The chief specimens are : house-board, carved and painted with dog design; carved bamboo boxes and gourds; bamboo

pipes ; boxes with beadwork decoration ; baby-carrier partly covered with beadwork ; swords (*parang-ilangs*) and sheaths ; shields, painted, and with tufts of human hair attached ; beadwork belt ; etc.

Burma. [Centre Case.] No attempt is made to illustrate the decorative art of this country in detail. The specimens shown are a few carvings in wood and ivory.

India. [Not in cases.] There is at present no special exhibit illustrating the art of this region. Indian objects not in cases are two carved teak doors and frames from Ahmadabad, and at the entrance to the South Corridor is a large carved wooden archway from Jeypore.

China. [Wall Case 61A.] The specimens exhibited are a few carvings in wood, ivory, and stone. They include a specimen of the well-known balls-within-balls.

Japan. [Wall Case 61A.] In the case are carvings in wood, ivory, and stone ; ivory card cases, long sword with ivory hilt and sheath ; a collection of netsukés, chiefly of ivory or wood. Examples of inlaid and lacquered panels are also shown.

It should be particularly noted that the Chinese and Japanese specimens do not purport to be representative of the art of these countries. The objects shown, however, serve to illustrate the skill and ingenuity of these peoples in the working of ivory and wood.

Enamel. In the adjacent centre case are two large *cloisonné* vases from Nagoya, Japan, each 5 feet in height. These are modern productions, and admiration may be given to the technical skill, rather than to the artistic qualities of the designs. The process of enamelling by this method is illustrated by a series of specimens in the narrow wall-case (61A) facing the vases.

IV. MUSICAL INSTRUMENTS.

Musical instruments are usually classified in three main groups—percussion, wind, and stringed. The first class is made to include a considerable number of instruments which are not played by striking, and the term is therefore apt to be misleading. From the point of view of form and construction, also, the group of " percussion instruments " is by no means

homogeneous, and the vibrating (sound-producing) parts differ considerably in different types of instruments. In the classification employed here, the term " percussion instruments " is discarded, and the group is broken up.

Wind and stringed instruments form two well-marked classes, each capable of sub-division. The usual classification of wind instruments is adopted here, but in the case of stringed instruments a change has been made from the conventional division into plucked, struck, and bowed. By basing the classification on form, and on the relationship of the strings to the sounding-box (when present), similar types are brought together, whereas the usual classification leads to separation of instruments of similar form and origin, as well as to the bringing together of structurally different types.

Keyboard instruments are excluded from the collection, which, with this exception, embraces practically all types of musical instruments.

Vibration of Bars, Plates, Membranes, etc.

[Centre Cases and Wall Cases.]

Bars and plates of wood, metal, etc., usually true percussion instruments. This includes the most primitive of all instruments, and reaches its highest development in the xylophone and harmonica. The old European piano harmonica was provided with a keyboard. The chief specimens shown are : pairs of wooden sounding-sticks, Australia ; bamboo clappers, Nagas of Assam ; castanets, ancient Egypt, China, and modern English ; triangle, English ; sistrum, Japan ; flat gongs, Burma ; instrument made of bamboo tubes, Java ; xylophones (*marimba*) from South and West Africa ; harmonica (*pattala*) from Burma, with iron sounding bars. Associated with these are a metal bird-scaring clapper from Borneo, and a wooden bird-scarer from Huntingdonshire.

Notched rods, etc., for producing a stridulating noise by rubbing with a shell, stick, or switch : notched spear-thrower, Western Australia ; small bow with notches, South Africa ; box-shaped instrument, the upper edges notched for rubbing with a switch, Belgian Congo ; bamboo stridulator, Nagas of Assam. The old-English watchman's alarm rattle in this case belongs to this group.

Tongues or pins of wood or metal played by plucking or bowing; bamboo *lakatoi* gong, with tongue for sounding, British New Guinea; bamboo jew's harps from British New Guinea and the Solomon Islands; iron jew's harp from India. Instruments (*zanze*, the so-called Kaffir piano) with wood or iron tongues, fixed to a small board, which may be hollowed out or have a gourd attached as a resonator, specimens from West and South Africa; interior of a European musical box for comparison with the *zanze*. These instruments are all played by plucking, but the old European nail-fiddle (*Nagel-geige*) was bowed. [Wall Case 80A.]

Gongs and sounding tubes: bamboo tube for beating on the ground, British New Guinea; gongs made of piece of wood hollowed out, Rarotonga (Pacific), Fiji, and Central Africa; small wooden gong with handle, used by street oil-sellers, China; bronze gongs, China, Japan, Burma. [Wall Case 85.]

Rattles of seed pods, maize stems, basket-work, gourd, etc., from New Guinea, North America, Africa. Iron anklets, made to rattle, Benin; ankle bells, East Africa. Bells of the grelot type, from Africa, Ceylon, Borneo, England. [Wall Case 84C.]

Bells from various parts of the world, including bells of wood or metal for attaching to cattle, mule, horse, elephant, camel; ju-ju bells, Benin; set of old team bells (by R. Wells) from Chichester; Roman bells; a 6th century Celtic bell; mediæval alarm bells from Northamptonshire; large Burmese, Chinese, and Japanese temple bells, and priests' hand bells; small European bells. [Wall Cases 84C, 85 to 87.]

Drums from Africa, Egypt, Burma, India, China, Japan, including an English 18th century drum formerly used in beating the bounds at Exeter; drum from West Africa with two human skulls attached, and a human shin-bone for a drumstick; Ashanti drum with 9 human jawbones attached; Tibetan drum made from the tops of two human skulls. [Centre Case.]

Tambourines from Maldive Islands, North Africa, Egypt, Spain, England.

Friction drum from the Congo, and toy specimens from Huntingdonshire. In the same case :— [Wall Case 107.]

Bull-roarers from Australia, British New Guinea, South Africa, Borneo, and England.

Wind Instruments.

[Wall Cases 81A and B, and 81-84.]

In the great majority of wind instruments the sound is produced by setting in vibration the column of air in a tube. The blowing is done with the mouth (rarely with the nose), or in the highest types, such as the organ, by mechanical means. The column of air in the tube or tubes is not set in vibration by the direct action of the air blown into it, but indirectly, either through the vibrations imparted to a "reed," single or double, situated at the point of entry or exit of the air, or through the vibration of bodies which do not form part of the instrument, such as the lips of the player. The main sub-division of the class is into instruments with and without reeds, respectively.

A.—Wind instruments without reeds.

(*a*) With "cup" mouthpieces, the lips of the player vibrating as a double reed. Includes horns, bugles, trumpets, trombones, cornets, etc. The chief specimens exhibited are :—

Horns of antelope horn, from Africa ; of horns of ox, buffalo, etc., from Africa, Borneo, Ceylon ; of ivory, from Africa ; made of a human thigh bone, from Tibet ; of wood, New Zealand, E. Africa, and Assam ; made of a conch shell, from Fiji Islands, and another from the Admiralty Islands ; one made of a helmet-shell, from British New Guinea ; horns of copper and brass, from Bombay and Nepal ; shell trumpet, and telescopic bronze trumpets from Tibet.

Ophicleide, 18th century, French. Serpent, early 19th century, German. Both these forms are provided with holes for fingering.

(*b*) **Whistles, flutes, and flageolets,** in which the column of air in the tube is set in vibration by blowing across

the mouth of the tube. In "key-whistles" and flutes the air is blown obliquely across the aperture, which is either at the end, or in the side, of the tube. In instruments of the "penny-whistle" and flageolet type there is a mouthpiece (the "fipple" mouthpiece) so constructed as to direct the air against the edge of an aperture further down the tube. There are exhibited:—"*Key whistles*" of various forms and materials from Africa, South America, etc. *Panpipes* from the Pacific and the Pyrenees. *Nose flutes* with aperture at the end, from British New Guinea and Borneo; these are held obliquely whilst being played. *Horizontal flutes*, the mouth aperture at the side of the tube, from Tonga Islands (Pacific), China, Germany, England. *Vertical flutes* with notched or bevelled lip, from British New Guinea, South America, Africa, Borneo, China, Japan, Turkey. *Flageolet* types from Dalmatia, Hungary, Germany, the Maldive Islands; double flageolets from Hungary and Bosnia; flageolets with beaked mouthpieces, old French and English; a double flageolet by Simpson, London, early 19th century. An ocarina from Italy. Flue-pipes from the orchestral organ.

B.—Wind instruments with reeds.

There are three main types of reeds and three corresponding classes of reed instruments. The *single beating reed* fits over the mouth aperture of the tube, and when the instrument is blown the reed beats up and down on the margins of the aperture; these vibrations are imparted to the column of air in the tube and a musical note is produced. The *double reed* consists of two thin lips which bound the mouth aperture of the tube, and these beat against each other when the instrument is blown. The two kinds of reeds are often classed together as *beating reeds* to distinguish them from the third class, the *free reed*. The latter essentially resembles the single beating reed, from which it is distinguished by its relationship to the aperture it covers. The aperture may be either that through which air is blown into the tube, or that through which it leaves. Instead of

being larger than the aperture it covers, as in the case of the single beating reed, the free reed is slightly smaller and it is therefore " free " to vibrate within the aperture, and does not beat upon the margins of it. As a rule, it is made of a thin rectangular slip of brass, fixed at one end.

Instruments with **single beating reed :** double-reed pipes (*zummarah* and *arghoul*), Egypt ; snake charmers' pipes, India ; old clarinet, England, 19th century ; drone reed of bagpipe and mouthpiece of modern clarinet, to show the reed.

Instruments with **double reed :** instruments of the oboe type from East Africa, India, China, Tibet ; old French hautbois ; German bassoon, 18th century.

Instruments with **free reed :** reed pipes from Borneo and Upper Burma ; mouth organ (*keluri*), Sarawak, Borneo ; mouth organ (*cheng*), China ; melophone, guitar-shaped, worked by a bellows, keys or " touches " for playing, Paris, early 19th c. A mouth organ, a toy-trumpet, and a large free-reed pipe from the automatic organ are shown to illustrate the free reed ; all these, and other European instruments of this class (accordion, concertina, harmonium), owe their origin to the adoption in Europe of the free reed from the Chinese *cheng*.

Instruments having **both single and double reeds,** and provided with a distensible air reservoir. *Bagpipes* are the only instruments in this group. The drone pipes have single beating reeds, whilst those of the chanters are double (single pipes are shown to illustrate this). Small and primitive bagpipes from North Africa are shown, and more elaborate ones from France and Spain. In all these the bag is inflated by means of a tube blown with the mouth. Bellows are provided in two other specimens exhibited, one being of the old Irish and Lowland Scotch type, and the other a set of Irish Union pipes by Harpington, Cork.

The **orchestral organ** near the exit from this hall has flue-pipes (" whistles ") and free-reed pipes.

Stringed Instruments.

The production of musical notes by the vibration of strings fixed at the two ends is a method which is of great antiquity. Stringed instruments have their chief distribution in the Old World (including the whole of Africa). They do not appear to have been known to the American Indians, and only a very few simple types occur in Oceania. The twang of the hunter's bow may have first suggested the musical possibilities of the stretched string, and it is certain that this weapon has given rise to more than one type of stringed instrument. In Africa and in parts of Asia one-stringed " musical bows " are still in use, some of them practically identical with the bow of the hunter, others more or less modified. A frequent addition is that of a gourd attached to the bow, to act as a resonator, and so magnify the sound produced by twanging or tapping the bow string. Types leading up from such an instrument to the harp still in use in modern Europe have been found in parts of Asia but especially in Africa. In the evolution of the piano the harp played an important part, and we therefore have in the musical bow, what may be regarded as an early and primitive " ancestor " of the modern grand piano—just as the early matchlock guns may be regarded as the ancestors of the modern magazine rifle. It would be difficult to prove that all stringed instruments are derivatives of the musical bow, but there is no doubt that this is the case with many types.

In playing a stringed instrument, the strings may be plucked with the fingers or a plectrum, struck with a stick or hammer, or rubbed with the fibres of a bow. In some cases the form of an instrument is sufficient to indicate that one of these methods cannot be used—the harp, for example, could not be played with a bow—whilst in others, any one of the three methods might conceivably be employed. As a rule, however, instruments of the harp and lyre types are plucked, those of the psaltery and dulcimer types are usually plucked or struck, whilst lute, guitar, and violin types are usually plucked or bowed. These are the three chief groups into which the Museum collection is divided, the classification being based on the relationship of the strings to the body of the instruments, and, in part, on the form of the body itself.

The Musical Bow : [Wall Case 62D.] bow with wire string, Basuto of South Africa ; bow with wire string, gourd resonator, and " tapper " of wire for striking the string, South Africa. Instruments from West Africa, of several small bows attached to a resonating box, the strings being attached at one end to the bows, at the other to the box (native names, *wambee* and *valga*) ; this is an important stage in the evolution of the harp, and perhaps of the lyre.

Harps and lyres. [Wall Cases 63 to 65.] An important feature of the modern European harp—the front pillar—is wanting in the types from Africa and the East, as it was in the ancient Egyptian harp. All are alike in the relationship of the strings to the sounding-box, and in their attachment to an arm arising from this. The strings do not pass over the sounding box, but are " free " or " open " for the whole of their course. Specimens shown :—harps from the Upper Nile and the Uganda Protectorate, for which a native name, *nanga*, is often used ; a large and a small *soung* from Burma ; an Irish harp by John Egan, Dublin, 1820 ; a pedal harp by Cousineau, Paris, 1770. Dital harps or harp-lyres, early 19th century, English.

In the lyre, the strings pass for a short distance over the sounding-box before becoming open, and they are attached to a crossbar which joins two arms arising from the sounding-box. The frame of the most primitive lyre is a closed one, unlike that of the simpler kinds of harps.

Lyres (one native name is *kissar*) from the Sudan, and Uganda. Lyre-guitars, early 19th century, specimens from Ratisbon and Naples ; in these the cavity of the body extends into the arms, and they therefore resemble the ancient Greek *kithara* in this respect. They are, however, hybrid types, since the strings pass over a fretboard.

Lute, guitar, and violin types. [Wall Cases 78 to 80 and Centre Case.] Instruments in which the back of the sounding-box is conspicuously arched, or vaulted, may be classed with the lutes ; usually they are played by plucking, but some are bowed. Guitars, zithers, and violins have the back of the sounding box flat, or nearly so ; guitars and zithers are played by plucking, violins by bowing. All forms are alike in the

presence of a hollow body to which a neck is attached. The course of the strings is partly over the body (or sounding-box) and partly over the neck. The latter often has ridges, or *frets*, against which the strings may be pressed to shorten the vibrating length. In many forms from Africa and the East the body may consist of a gourd, or the shell of a tortoise. The specimens shown include —

Lute types (with vaulted back): one-stringed instruments, probably derived from the musical bow, with gourd resonators, from Africa and the Seychelles Islands; several examples of the North African *guenbri* with two or three strings, the bodies being of gourd, of the upper half of a tortoise shell, or of wood; similar form from West Africa; several instruments from India, of the *sitar* type, some with gourd bodies, and some with sympathetic wires as well as the principal strings; mandolins, which are the only surviving members of the family of lutes, specimens from Naples, 1797, and Cremona, 1827. All the preceding forms are played by plucking. The "peacock guitar" from India is sometimes bowed. The following are instruments with vaulted back, which are played with the bow: —*saringi*, *sarungi*, and other fiddles from India; monochord fiddle, Roumania, the back of the body (which is in one piece) carved to imitate that of the lute or mandolin.

Instruments with flat or slightly arched back, include :— Old English cithers; a guitar (German, early 19th century); pandore (Italy, 18th century); bandurria (Spain, 18th century). These are played by plucking. In the keyed zither (English, about 1800) the strings are struck by small hammers, worked by pressing keys. In the hurdy-gurdy or *vielle* (French, 19th century) a rosined wheel rubs on the strings, which are "stopped" by pressure on the keys. *Pipa* or balloon guitar, *yueh-ch'in* or moon guitar, China; *erh-h'sien* or fiddle with two silk strings, several specimens, one with the bow, China. Two-stringed instrument of the guitar class, Borneo.

Violin types: the following are played with a bow, and belong to the class of viols and violins :—viole d'amour (French), viol-shaped violin with wire strings, viola (Bavaria, 1793), viola da Gamba (Joachim Tielka, Hamburg, 1602),

violin (London, 1682), kit violin, mute violin with skeleton body (Italy, 19th century). Fiddle of form almost identical with the European violin, Burma. In the same case with the violins are the following :—*rebab*, North Africa, from which type the mediæval European rebec was derived ; old *sordino*, or dancing master's fiddle, Italy, a survival of the *rebec* in form.

Psaltery and Dulcimer types. In the instruments of this class the strings are attached at both ends to the body of the instrument, over which they run for the whole of their course. The simplest types are lengths of bamboo with strips of rind separated to act as strings.

[Wall Cases 62 A,B,C.]

The old psaltery was played by plucking, as were the spinet and the harpsichord. The dulcimer, the old clavichord, and the modern piano, are examples of instruments played by striking the strings. In the African and Asiatic types the strings are usually plucked. The specimens shown include :—bamboo or other instruments with strips of rind separated for strings, British New Guinea, Borneo, Cameroons, and Madagascar ; another similar specimen, but with the strips tied on, Malay Peninsula ; an eleven-stringed instrument of pieces of maize stem, with strips separated as strings, Egypt ; a similar instrument with gourd resonator, Ashanti, West Africa ; instruments with strings across a shallow open box or trough, East Africa ; three-stringed instrument (*mingas*), the hollow body in the form of a crocodile, Burma ; *koto* with 13 strings, Japan (one large and one small example). Model of Æolian harp ; bell harp (English, early 18th century), strings missing ; cordophon (German, 17th century) ; double psaltery (German, 16th century), two specimens, strings missing ; bowed zither (German, 19th century) ; dulcimer (Italy, 1757).

V. MAGIC AND RELIGION.

The classification and arrangement of the objects in this section of the Museum present special difficulties, due in part to the fact that the specimens obtainable represent only one aspect, and that not the most important one, of a vast and

complex subject. Certain portions of the collection, moreover, such as that relating to Buddhism, are over-weighted, whilst others require development.

Magico-religious ideas, actions and objects are so intimately bound up with the daily life and social conditions of mankind that it is only when we deal with certain classes of specimens, such as those associated with the great organised religions, that a satisfactory classification can be arrived at. At one end of the series we have magic, which is usually regarded as a direct influence on nature by some material object, or by some action performed, and at the other end religion, which relies upon spiritual beings or influences of one kind or another. The widespread belief in charms (amulets and talismans) is evidence that religion cannot banish the belief in magic.

Magic.

[Large Table Case.]

For our present purpose we may include amongst magical objects the following :—amulets and talismans, objects used in magical ritual, in benevolent and malevolent magic, and in divination. Such tangible evidences of belief in magic are found amongst both civilised and uncivilised peoples, and they are present not only alongside advanced religious beliefs, but often in close association with them.

What is now often called "*sympathetic magic*" has its main origin in a widespread ignorance of natural laws, combined with a crude form of reasoning which is guided by association of ideas. It is convenient to divide sympathetic magic into the two divisions of contagious magic and homœopathic magic.

Contagious magic is based on the idea that objects or substances once related to one another by contact or possession will retain a relationship and exercise an influence after separation has taken place. The common practice amongst backward peoples of destroying or burying bodily waste (such as hair-clippings or nail-parings) is due to the fear that they may be used in magical practices to injure the person from whom they came. Again, the hair of a dead man may be made into an arm-band, which will endow the wearer with

his courage and strength ; or the tusks of wild boars may be worn in order to acquire the power and ferocity of the animal.

Homœopathic magic is based on the exaggeration of the significance of resemblances, whether of appearance or behaviour. Thus, amongst uncivilised peoples the production of imitation clouds, thunder, and lightning, are usually essential parts of ceremonies performed for the production of rain. A shell which suggests the form of a human ear may be carried as a cure for earache in our own country at the present day (see specimen.)

Both contagious and homœopathic magic are illustrated in the collection in the large table case, where one compartment is set aside for charms and other objects which have a particularly close and obvious connection with these two aspects of sympathetic magic.

Amulets and talismans. These are usually spoken of as charms, sometimes as mascots. They are supposed to possess an intrinsic and magical power of conferring benefits, warding off dangers, or otherwise influencing the natural course of events. It is convenient to describe as *amulets* those charms which are protective and preventive in respect of illness or danger, both from natural and supernatural sources, and as *talismans* those which confer desired qualities or benefits, or ensure good luck. Some charms combine both functions. The belief in the virtue of many charms is clearly based on the principle of sympathetic magic.

There are shown in the case :—amulets from New Guinea, Africa, India, Tibet, China, and elsewhere, including scarabs and small figures of the gods from ancient Egypt, which were used to protect not only living persons, but also the spirits of the dead ; also an interesting collection of amulets, such as are still in use amongst peasants, labourers and others, in our own islands. These comprise :—smooth stones, holed stones, bones, moorhens' feet, moles' feet, bats' wings, shrivelled potatoes, etc., all these being worn, carried, or suspended, to protect against witches, evil spirits, rheumatism, cramp, gout, etc. ; to protect sheep from dry rot, pigs from swine fever : to prevent witches from turning milk sour, etc. There are also " evil eye " amulets from Italy, Montenegro, Palestine,

Egypt, England, and elsewhere, and written charms from Africa and Ceylon. A small collection of "mascots" illustrates the revival of superstition during the Great War; objects of various kinds were worn or carried by sailors, soldiers, and others, in many cases the mascot or charm owing its "virtue" to the unconscious belief in sympathetic magic.

In the same case are **talismans,** such as dolls carried by women who desire to have children, South Africa; bones, teeth, boars' tusks, etc., worn to acquire strength and bravery; arm bands of string made of the hair of a dead man, worn for a similar purpose amongst the Arunta tribe of Central Australia.

Evil magic. Various objects shown in this case are used in "black magic," such as the "pointing bone" of Australia, for bringing about the disease or death of an enemy; pair of *kurdaitsha* shoes from Central Australia; magician's charms of lengths of vine stems resembling human bones in form, and used for putting an evil spell on persons it is desired to injure, from Mabuaig, Torres Straits islands; heart with pins and nails put in to take off an evil spell laid on sheep by a wizard, from near Exmouth.

Divination. The art of divination is based on the assumption that information as to the past, present, or future may be obtained by the interpretation of events or appearances over which man has no control. The specimens include:— an interesting set of divining bones, shells, etc, used by a native witch-doctor in Natal; a small animal-shaped wooden divining-block with "rubber" used by the Bakongo of the Kasai, Belgian Congo; inscribed bamboo cylinder, Batak of Sumatra; Chinese divining compass; dowser's rod for finding water, Horsham.

Animals in Religion.

[Wall Cases 66 to 68.]

Amongst many peoples, and especially amongst backward races of mankind, animals are often believed to have human qualities, or even supernatural powers; in some religions, also, they are associated with the gods, of which they may in certain

cases be regarded as incarnations. Sacred animals are treated with special care and respect and are sometimes objects of worship. An important aspect of the attitude of man towards animals is manifested in what is called Totemism.

Totemism. This form of animal cult is found in one form or another amongst many backward races, and it has probably given rise to some, at least, of the animal worship of more advanced peoples. Even the use of animal crests and badges may in some instances be a survival of totemism.

In the case there are shown objects associated with the totemism of the Australian aborigines, amongst whom it prevails in a well-developed and characteristic form. A totem may be defined as an animal or plant (much less frequently an inanimate object) which stands in a special relation to the members of a group or division of a tribe. The relationship is not between individual animals and individual men or women, but between *all* the animals of the kind in queston, and *all* the men and women whose totem it is. Thus, for those who belong to the emu totem clan, all emus are regarded as blood relations, and so for other totem animals and plants. It is usually forbidden for a man to kill an animal of his totem, and he may only eat it under special circumstances. Ceremonies performed in connection with the numerous totems of the tribes form an important part of the religious life of the Australian aborigines. The only specimens at present exhibited are stone and wooden *churingas*, which are sacred objects carved with designs of a totemic character. They are kept in sacred places, which acquire the character of sanctuaries, and they may not even be seen by women, children, or uninitiated men. Some of the wooden churingas exhibited have a hole at one end, to which is attached a length of hair-string; these may be swung round in the air at certain ceremonies and they are thus used as bull-roarers (see below, p. 64).

The totemism of the Indians of the north-west coast of North America differs considerably from that of the Australian aborigines. The carved "totem poles," models of which are shown, are associated with totemism, but the animals or mythical creatures represented on them are not the totems of the owner of the pole. They are rather of the nature of

animal familiars or guardian spirits, and the poles are to some extent heraldic in character ; some of them may be described as crest poles, but others are made to illustrate stories or legends, Paintings and carvings of similar character are to be found on other objects (see also Decorative Art section).

Sacred animals. Sacred animals, animal-incarnations of gods, and animal gods, were well represented in the religion of ancient Egypt, and they play a part in modern Hinduism. It is not improbable that the religious importance of certain animals in ancient Egypt was due to a survival or persistence of totemism. The mummification of animals was, however, a late manifestation of animal cult ; mummies of the crocodile, the hawk, the ibis, and the cat are shown, together with images of animals and birds in wood or bronze. Several of the gods and goddesses were usually represented with an animal's head, and a figure of the hippopotamus-headed goddess Ta-urt is exhibited.

Animal cult in Hinduism is represented in the case by images of Ganesa, the elephant-headed god of Wisdom, and of Hanuman, who is the monkey-god who scares away evil spirits and is the giver of offspring. Other sacred animals are also represented.

The case also contains specimens relating to the cult of animals in British New Guinea (large turtle-shell mask), Africa, Borneo, and amongst the Ainu of Japan.

Cult of the Dead.

[Wall Cases 69 to 73.]

The belief in a future life is world-wide, and is found in various forms amongst both civilised and uncivilised peoples. In most cases, life in the other world is believed to resemble life on earth, and the spirits of the dead are supposed to require food and other worldly goods for the maintenance of their existence or their status. From this assumption there has been developed the widespread practice of burying with the dead, or placing at their graves, a supply of food and drink, as well as tools, weapons, ornaments, and clothing. The implements and utensils are often broken, probably in order that their " spirits " may be set free to join that of the

deceased. The killing of wives and other dependents of a dead chief or king has a similar significance.

Specimens illustrating the objects that may be placed with the dead are shown in cases 69–70, and in the Egyptian tomb in this bay. The Sakai (Malay Peninsula) adze blade and sword blade are from the grave of a man, and the bracelets, on the arm bone, from that of a woman. The examples of tomb pottery from China date from the T'ang period, 600-900 A.D., but their exact significance is difficult to determine. Amongst the ancient Egyptian specimens shown here are: a mummy of a lady of Dynasty XX., about 1200 B.C. (other mummies are shown in the South Corridor); a wooden pillow, a stele or sepulchral tablet, canopic jars, vessels for oils and unguents, several ushabti figures, a model of a boat, and other objects, all of which had their special purposes in relation to the welfare of the dead person in the Underworld. The ushabti figures were believed to pass to the other world as workers who would relieve the deceased of arduous duties which might be assigned to him.

The contents of the Egyptian tomb in this bay illustrate the provision made for a dead person at an early period in the history of civilisation in the Nile valley. The tomb was excavated at Abydos, and dates from the First Dynasty, probably from the reign of King Merneit; it is therefore about 5000 years old, or, according to another scheme of chronology about 7500 years old. The skeleton in the original grave fell to pieces when removal was attempted, and that shown in place is from another Egyptian tomb of slightly earlier date. The walls and floor of the tomb are made up for exhibition purposes, but all the contents are original, and are placed in the relative positions in which they were found. They include vessels of earthenware, alabaster, and slate, a flint knife, polished flint armlets, stone and other beads, a flint flake, two large stones, and part of the skull of an animal, probably a gazelle.

With the belief in a future life there is usually associated a greater or less fear of the dead, and a desire to propitiate their ghosts or spirits by means of offerings and signs of respect, or even by worship. There is thus in many parts of the world

a cult of the dead which manifests itself in a variety of ways. A discussion of this subject is far beyond the scope of this guide, especially as the specimens shown only cover a small portion of the field. The skulls or heads of enemies are preserved by head-hunting tribes in New Guinea, Borneo and elsewhere, and the same parts of members of their own community are preserved by some peoples. The respect for the dead which approaches or reaches true **ancestor worship** permits of illustration in the form of images, masks for ceremonies, and other objects.

The chief specimens shown are :—skulls from New Guinea, one with the face partly restored; New Guinea (Papuan Gulf) masks and tablets associated with a form of ancestor-cult ; an almost life-sized carving of a human figure, in wood, with necklets and other ornaments, representing Ukaipu, ancestress and goddess of the people of Orokolo, Papuan Gulf ; chalk images of the dead, from New Ireland, intended as earthly habitations for the spirits of the dead, which are thus prevented from plaguing the survivors ; dancing masks and carved wooden ancestral posts, New Ireland. The body of the mummy-like human figure from Malekula, New Hebrides, is made up of bamboo and a composition of fibre and gummy substance, but the skull is that of a dead chief, the face being artificially restored so as to represent the features of the deceased. Such figures are kept in temple-huts, and they represent chiefs who after death still exist as souls in a semi-corporeal existence, and who order the affairs of earth and punish those who trespass. The two wooden figures from the Nias Islands are ancestral in their character, ancestor cult playing a prominent part in the religion of the people.

Two specimens from Uganda, in this series, illustrate what may be called early stages in deification. Amongst the Baganda of East Africa the umbilical cord of an infant was preserved, and in the case of a prince it was wrapped in a covering of bark cloth, sometimes ornamented with shells and beads. The relic was supposed to have close relations with the spirit or ghost of the prince, and during his life it was called his twin, or "mulongo." In the case of a dead king, his

mulongo, together with his jawbone, was placed in a temple of its own, the body being buried elsewhere. The ghosts of kings were on an equality with the gods, and received the same honour and worship. The reigning king made periodical visits to the temples of his predecessors, and other persons were permitted to do homage to the jaw-bone and mulongo which constituted the symbols of the god. The cowrie-covered mulongo exhibited is that of an early king of Uganda, and is, therefore, a part at least of a god. It should be noted, in the interests of stricter accuracy, that it is with the jaw-bone that the spirit of the deceased king is supposed to be more closely connected; the Baganda believe that every child is born with a double, which is represented in material form by the after-birth ; the ghost or spirit of the double attaches itself to the umbilical cord, and it is important that this spirit should be kept in association with the living child in order to keep it healthy. Hence the preservation of the cord (or a part of it), and its name of " twin." In the complete deified king there must be the jawbone, to which the spirit of the king himself is attached, and the mulongo, for the spirit of his double.

Heroes and ancestors as gods. Some aspects of ancestor worship amongst backward peoples have been touched on above, but in more civilised communities, hero and ancestor gods acquire greater importance and wider recognition. Amongst the Chinese and Japanese, ancestor worship is one of the most important phases of religion, and the Chinese family ancestral tablets—a specimen of which is shown—are the concrete symbols of a practice which is deeply rooted in the life and thoughts of the people. The tablets commemorate the virtues and exploits of the deceased, and one of his three souls is supposed to enter the tablet during worship. In addition to this worship of family ancestors, there are gods which have their origin in warriors, sages, and other earth-born personalities. Confucius (B.C. 551-477), the founder of the Chinese religion called by us Confucianism, is now worshipped as a god, and in fact he may be regarded as the chief god of China. The god of war, Kwan-te, worshipped by military men, officials, and others, was a distinguished general

who lived about 1900 years ago. Each of the three religions of China, Taoism, Confucianism, and Buddhism, has gods of this class. Images of the god of war, and of the god of literature, are shown in the case. Some of the gods of Hinduism are partly or wholly of human origin, Rama and Krishna, images of whom are shown, being partly at least based on the exploits of men who have since been deified.

Fetishism. [Wall Case 74.] Fetishism is a crude form of religion which is especially characteristic of West Africa, though similar beliefs occur elsewhere. The spirits or gods of fetishism are believed to take up their abode in, or exercise their influence through, material objects of any kind, and to these objects the name of fetishes has been given (from Portuguese feitiço, a charm or saint's relic).

The fetish is a link between the worshipper and the object of his worship, but it is not an image or a symbol of a deity, as is an idol. The distinctions between a fetish, an idol, and even a charm, are, however, not always easy to draw.

A fetish is supposed to protect its possessor, or the worshipper of the spirit dwelling in it, from evil of a general or special character, and to provide him with good fortune in his various undertakings. The worship and propitiation of the spirit of a fetish may involve sacrifices, sometimes of human beings. This was the case with the "ju-ju" worship of West Africa, as organised in its most developed form in Benin.

As regards its material nature, a fetish is often a natural object of an unusual shape or kind, or one that has attracted attention in some way. Or it may be a manufactured object, such as a human figure carved in wood; in this case, however, the essential part of the fetish is usually a mixture of magically powerful substances, such as are used for charms. These substances are provided by a "witch-doctor" or a "priest," who is credited with the power of inducing a spirit to take up his abode, temporarily or permanently, in the resort provided for him.

The specimens exhibited are chiefly from West Africa. The smaller human figures carved in wood will be seen to have a cavity in the middle of the body to hold the magical

substances. This is closed in front by a piece of glass, often a fragment of a mirror. Two of the figures are "ornamented" with objects of various kinds hung about the body, and these also aid in giving power to the fetish. The largest figure, or "nail fetish," has had the magical materials removed, but the cavity in which they were contained is conspicuous. These nail fetishes are prepared and kept by witch doctors, and a native desiring to obtain a favour by the aid of the fetish pays for the privilege of driving a nail or spike into the figure as a form of application. Sometimes, also, the nail-driving is intended to bring sickness or death upon an enemy, by the power of the fetish.

Other specimens shown in the case are objects associated with "ju-ju" worship, and there are also specimens which are of the nature of fetishes, from Uganda.

Spirits and Demons. [Wall Cases 75 to 77.] The specimens exhibited in this series are mainly masks and images which are associated with a variety of social, magical, and religious practices. Space does not permit of a description of the customs and beliefs represented by the specimens, and indeed in some cases the information is not available. Masks are often worn at initiation ceremonies, death dances, and religious rites of many kinds, to frighten away spirits which bring death or disease, and in various ceremonies of a magical intention. Human images, also, have a wide range of significance, and both masks and images are usually connected with a belief in spirits, demons, gods, or other supernatural beings. Some of the specimens are used in the ceremonies of secret societies.

Amongst the specimens shown are:—*Masks* from New Guinea, New Hebrides, America, Africa, Borneo, and Ceylon, including one used in circumcision ceremonies by the Ba-Pindi of the Kasai (Congo), masks of the Bundu secret society, Sierra Leone, and several elaborately carved and painted "devil dancer's" masks from Ceylon, worn in ceremonies for driving off the spirits of disease. There is also an initiation ceremony head-dress from the Solomon Islands, and a large wooden *image* from the Nicobar Islands.

Bull-roarers (*see* Case 107) are noise-making instruments which are widely used amongst backward peoples in initiation and other ceremonies. The sound produced when they are swung round in the air is often regarded as the voice of a spirit, and is used partly to terrify the women and children, who are not allowed to see the instruments. Bull-roarers survive in civilised countries as children's toys.

Polytheism. [Centre Case O.] When spirits, demons, and gods have acquired sufficient individuality in the eyes of their worshippers, and have been grouped into a system of deities each having special attributes and powers, the form of religion arising may be called polytheism. There is, however, no boundary line between primitive religions in which a number of demons or gods play a more or less conspicuous part, and more developed religions in which the civilisation and co-ordination of the gods have gone on alongside that of their worshippers. Organised polytheistic religions are best developed amongst semi-civilised or civilised peoples, the system forming a reflection of the condition of organisation of the peoples themselves. The gods are also regarded as possessing moral and even physical characters similar to those of man, and they may be given a similar social organisation. Their conduct and activities within their own sphere, and in relation to man, often form the subjects of sacred poems or other writings.

In most cases the gods may be traced to two sources of origin :—*Nature*, as in the case of sun-gods, earth-gods, thunder-gods, animal-gods, etc. ; and *human life*, as in the case of household gods, village gods, deified ancestors, and divine kings and heroes. Images of the gods, usually, but by no means invariably, in human form, play an important part in most polytheistic religions. In the cases the two polytheistic religions that are at present represented are those of Ancient Egypt and modern India (Hinduism). It must be remembered, however, that less developed systems are found amongst the Polynesians and others, whilst Polytheism was the form of religion prevalent in ancient Greece, Rome, and other early civilisations, and is intermingled with the religious systems of China and Japan at the present day.

The gods of Ancient Egypt. The gods worshipped by the ancient Egyptians were very numerous, partly as the result of the intermingling of Nature-gods with tribal or local deities, some of the latter being of an animal nature. Each god or goddess had special powers and attributes, and of some of them it might almost be said that their duties were strictly defined. From an early period there was a tendency to provide a god with a female counterpart or wife, and a son, the best known of these triads or trinities being that of Osiris, his wife Isis, and their son Horus.

Images of the gods were made in great numbers, some of them being dedicated to the deity represented, whilst others were made for amulets or talismans, and used to obtain the protection or favour of the deity for the dead as well as the living.

In the case there are shown images of various gods in bronze, wood, etc., including Osiris, Isis with Horus, Harpocrates (a Greek form of Horus), Ptah, Nefer-Atmu, Sekhet, Anubis, Bes, Ta-Urt.

The gods of Hinduism. Hinduism is a convenient term for the religion of some 200,000,000 Hindus. It has many sides and includes many doctrines. In its higher forms it tends towards monotheism (belief in one god), whilst three of the more important deities (Brahma, Vishnu, and Siva, forming a Tri-murti or trinity) are by some believers regarded as the only true gods. Polytheism is general amongst the people, and it is often associated with still lower forms of magic and religion.

The gods of the Aryan tribes who invaded North-West India before 1000 B.C. were Nature-gods, such as Father Heaven, Mother Earth, and the Sun-god. Some of these have persisted, and they are now associated with a multitude of gods of indigenous origin.

The two principal, and rival, churches of modern Hinduism are mainly devoted to the worship of Vishnu and Siva respectively. Each of these gods has a wife or female form, and Vishnu is supposed to have appeared on earth in a number of incarnations, or *avatara*.

In addition to the more important deities, such as are represented in the case, numerous tribal and village gods and godlings are worshipped and propitiated by the people.

The specimens shown include images of Brahma, the creator; Vishnu, the preserver; and Siva, the destructive and reproductive power of nature. Parvati, the consort or female form of Siva, is known under several names; as Kali, goddess of terror and destruction, she is represented in the case by an ancient marble figure, as well as by a large papier-mâché group in which she is shown standing on the prostrate form of her husband Siva. Ganesa, the elephant-headed god of wisdom, is represented by an old sandstone carving from Java, as well as by other smaller images. Hanuman, the monkey-god, who scares away evil spirits, and is also the giver of offspring, Saraswati, the wife of Brahma, Lakshmi, the wife of Vishnu, Krishna, Rama, and some of the incarnations of Vishnu, are represented by images in marble, brass, etc.

Temples, Offerings, etc. [Centre Case O.] A small series of objects illustrates the widespread practice of offering to the gods, or other supposed supernatural beings, offerings of various kinds. The offerings or sacrifices may be made to propitiate, or to obtain the favour of the god, or as a sign of gratitude for benefits received. They range from the sprinkling of a few drops of liquid to the gods before any is drunk, to the sacrifice of treasured property, sometimes with elaborate ceremonial rites.

The objects shown are associated with various aspects of the practice, amongst peoples as widely different in culture as the ancient Indian tribes of Colombia, the Ainu of Japan, and the Hindus, Tibetans, Chinese, Japanese, Belgians, and the ancient Etruscans. The specimens from the civilised countries are chiefly votive offerings and incense burners.

Associated with these specimens are several models of temples and religious buildings, including an alabaster model of the Taj-Mahal at Agra, India, a mausoleum built about 1640 A.D. by the Shah Jehan in honour of his dead wife.

Buddhism [Centre Cases K., L.] and associated religions. The doctrines of Buddha, who lived in Northern India from about 570 to 490 B.C., were in the main intended to teach men to live so that they might obtain salvation. By following Buddha's precepts men could reach the "state of him who is worthy," and so attain Nirvana—a condition to be reached in this life and not after death, as is often erroneously stated. Such a man became released from further participation in the "transmigration of souls," by which is meant a series of rebirths and existences in the forms of animals, other men, or gods.

According to the Buddhist theory, a "Buddha" appears on earth from time to time and preaches the true doctrine. The Buddha who founded the religion now called Buddhism was of Aryan descent, and belonged to the Sakiya clan. He was born at Kapilavastu, about 100 miles from Benares, his family name being Gotama, and his individual name Siddhattha. He is also sometimes spoken of as Sakiya-Muni. His religion was of the nature of a reaction against the formalism of the Brahmins, and he preached equality and charity. The gods were of less importance than those perfect men (Buddhas) who were sanctified by knowledge and understanding, and had attained Nirvana. Below these, but still superior to the gods, were the Bodhisats, almost perfect men who had only one more life to go through before becoming Buddhas.

In India, the place of its origin, Buddhism was displaced some hundreds of years ago by Hinduism (*see* Polytheism). The religion is, however, professed by many millions of people in Ceylon, Burma, Tibet, China, Japan, and other countries of southern and eastern Asia. In these countries there has been, to a greater or less extent, not only considerable modifications in the religion itself, but also an intermingling with other faiths and superstitions. The subject of these changes is far too large to be discussed here, nor can the differences between Northern and Southern Buddhism be considered. Particulars as to associated religions, such as the Confucianism of China and the Shintoism of Japan, must also be sought for in special treatises.

Ceylon, Burma, Siam. There are shown images of Buddha in various attitudes, of wood, marble, bronze, etc., and some other objects illustrating Buddhism. In these countries the founder of the religion has maintained his importance to a greater extent than is the case in those regions where Northern Buddhism prevails.

China. In China there are three chief religions, each of which is recognised by the State. Taoism, Confucianism, and Buddhism differ in origin and character, but the divisions between their adherents are not so well marked. In each there are many deities, some of which may be common to all. The total number of gods is very great, and includes Nature-gods, deified men, gods of trades and occupations, and others. In addition there is the worship of ancestors to which reference has already been made (*see* p 61). It will thus be realised that the subject of the religions of China is not a simple one. Images of the gods are made in great numbers and in a variety of materials. Buddhist images are chiefly of Sakya-Muni (Gotama) or other Buddhas, and of the numerous Bodhisats. Amongst the latter, Kwan-yin, god of charity and mercy, and giver of offspring, is often represented, sometimes in female form.

Some of the specimens are probably images of Taoist gods, but their names have not been determined. Confucius, the founder of the religion that goes by his name, is worshipped as a god, as is also Lao-tze, the founder of Taoism.

Japan. Shinto, the older of the two religions of Japan, forbids the making of images of the gods. Japanese Buddhism, derived from that of China, gives chief importance to the " Buddha Eternal " (Amida) and the Bodhisat Kwan-on (the Chinese Kwanyin), though Sakya-Muni is not excluded. There are some 1,000 Buddhas worshipped by the different sects.

Kwan-on is worshipped under thirty-three forms, and although usually regarded as a god, in the images the feminine aspect predominates. Several images and shrines of Kwan-on are shown, and also images of Buddha. A large Buddhist shrine is shown in a case of its own at the end of this hall.

Images of several gods and divine beings are shown in the case.

Tibet. The main religion of Tibet is a debased form of Buddhism, and is usually called Lamaism. Buddhism of a modified type was introduced from India about 650 A.D. and was grafted on to the indigenous religion, or Bon-pa, with the result that the present system is far removed from any other form of Buddhism.

The monks or priests (lamas) are the chief officials of a church which is under the control of a priest-king, the Dalai Lama, and which has some superficial points of similarity to the Roman Catholic church, especially in the importance attached to ritual and ceremonies. There are several sects and numerous sub-sects.

The Tibetan lives in a world of malignant demons and evil spirits, and the lamas control the means of protecting him from their malice. There are hosts of gods, demi-gods, genii, fiends, devils, and other supernatural beings, all of whom are more or less amenable to treatment by means of prayers, exorcisms, spells, and charms. The results of divination are important factors in the determination of the acts and movements of daily life.

Some of the gods are Buddhas and Bodhisats, others are Hindu deities, and yet others are of indigenous origin.

As in other forms of Buddhism, the avoidance of "transmigration" is one of the chief rewards of the true believer.

The specimens shown include a few images of deities; prayer-wheels, thunderbolt daggers, handbells and other objects used by the lamas; a temple banner; wooden blocks for printing charms; devil-dancers' masks; and other specimens.

Jainism. Jainism, like Buddhism, arose as an heretical sect of Brahminism, and has similar doctrines. It still persists in some parts of India (Bombay and Mysore). Jainism teaches how to avoid transmigration by asceticism and knowledge, and it is characterised by the great stress it lays on the avoidance of taking life, even of the smallest living creatures. Above the gods it places the twenty-four

[Centre Case L.]

Tirthamkaras, or Jain Lords, men become divine by their virtues and struggles.

The chief specimen exhibited is a fine large black stone image of Neminatha, the 22nd Jain Lord. It comes from Mandilapura, and dates from the 12th century A.D.

Christianity. Very few specimens relating to Christianity are at present on exhibition, and they are of a miscellaneous character. They include an old German carving of Christ bearing the cross, and another representing the entombment; other specimens may be added to the series.

VI. TRAVEL AND TRANSPORT.

Devices and appliances for lightening or obviating the labour of walking, and for facilitating or avoiding the burden of carrying his property from place to place, have led man to the construction of the railway train and the motor-car. The mammoth liner has been developed in the course of man's conquest of the ocean, at first an impassable barrier. The early steps in invention are of a simple character, in this as in other directions, and the beginning of the present complexity of the means of travel and transport in civilised countries may be dated from the application of the steam-engine to carriages and ships, early in the last century. The Museum collection is confined to the simpler contrivances, chiefly those of modern backward races.

Means of Travel and Transport by Land.

[Wall-cases 88 to 90 and Centre Case.]

Woman was man's first beast of burden and she is not yet entirely emancipated, since there is still the baby to be carried. Amongst backward races various kinds of slings, bags, or baskets are employed for this purpose, and even in this country a shawl may be similarly used. Other kinds of burdens may be lightened by the use of straps and carrying-sticks, and the labour may be avoided altogether if domesticated animals are available. Palanquins or sedan-chairs, litters, and such like, are passenger conveyances, usually carried by men, but sometimes by beasts of burden.

Snow-shoes have owed their origin to special conditions, and the sledge also is characteristic of regions of snow and ice. Vehicles which slide over the ground are not common elsewhere, but the still existing Irish slide-car is an example, and some North American Indians of the plains used their tent poles for hauling baggage, one end of the poles dragging along the ground; the *travois* of the Indians was of the same class.

Wheeled vehicles are obviously the most important factors in land travel and transport. The wheel was used in the Old World in prehistoric times, and the early stages of its evolution can only be conjectured. It may, perhaps, be sought in the use of rollers for moving heavy objects, such as slabs of rock. The wheels would then represent the two ends of a roller, the middle portion being thinned out and now appearing as the axle. Vehicles may still be found mounted on solid wheels, and wheel and axle sometimes go round together.

Aids in carrying: model of woman carrying pot on the head and at the hip, India; model of Indian portable cradle, Red River, North America; skin bag for carrying baby, South Africa; baby-sling, Andaman Islands; model of woman carrying baby in shawl, Mexico; carrying-band used for carrying baby or other burden, Ainu of Yezo, Japan; Maori carrying-band, New Zealand, and another from North America; model of wood-cutter carrying his bundle of wood by means of a carrying-band, Mexico; burden stick or "single yoke," for shoulder, Hawaii and Malay Peninsula; models of Indian and Chinese coolies with burden-sticks loaded; model of water-carrier with double yoke, Mexico.

Carrying-baskets from the Philippine Islands, Khasi Hills Assam (model), Nagas of Assam; German shell-carrier, 1918; ivory figure with carrying basket, Japan.

Beasts of burden (models): camel, elephant, bullock, pony, with loads or riders, and trappings. Also a few accessories, including: Eskimo dog-whip, Alaska; elephant driver's crook, Malay Peninsula; ankus or elephant goad, India; ox-goad and sheath, Pyrenees; models of paniers for reindeer, Lapps of Sweden.

Palanquins (models) from India, China, and Japan. A real sedan-chair of the period of Queen Anne is shown outside the case.

Sliding vehicles : ivory model of Eskimo dog sledge, Alaska ; wooden models of Irish slide-cars from Co. Antrim ; full-sized reindeer sledge (*pulka*) from Lapland ; model of Russian sledge party, carved in meerschaum (in form of a tobacco pipe).

Snow-shoes, etc. : snow-shoes from North America ; pair of modern Norwegian skis.

Wheeled vehicles (models) : carts with solid wheels fixed to [Centre Case.] the axle, which turns with them, Co. Antrim ; carts with solid wheels revolving on the axle, Burma and India ; carts with wheels nearly but not quite solid, Burma; bullock-carts of various types, with spoked wheels, Burma and India ; Chinese and Japanese jinricshas ; man with wheel-barrow, Mexico, and a Chinese wheel-barrow with passengers and luggage.

Means of Travel and Transport by Water.

[Cases 91 to 106.]

The floating log used as an aid in crossing rivers may have been the earliest canoe. Several logs bound together made a raft, a type not likely to become extinct. A single log with a hollow for crew and cargo formed a dug-out canoe, such as those of modern savages or the prehistoric European. From the dug-out, possibly in more than one region of the world, the plank boat was developed. Many modern canoes from Oceania and Africa consist of dug-outs with their sides raised by means of planks tied or sewn on, and in more advanced forms the planks have encroached so far as to render the hollowed-out log superfluous. The use of pegs or nails to fix the planks together is a further step, whilst the development of the ship from the boat has gone on during historical times.

Double canoes and outrigger canoes are especially characteristic of the Pacific and Indian Oceans. They give greater stability to the narrow and easily capsized dug-outs.

Bark canoes and skin canoes (like the Eskimo *kayak* and the ancient British coracle) have probably played little part in the evolution of boats and ships.

The savage, and even people advanced far beyond a state of savagery, uses paddles both for propelling and for steering. Oars are confined to civilized peoples. The fixed rudder is a derivative of the steering paddle, and its median position is a relatively modern feature.

Sails are known to most races living near the sea and having any aptitude for voyaging.

All the specimens are models, unless otherwise stated, and they are made by natives.

Rafts (models): katamarans from Bruner Island (near New Guinea), and Ceylon; fishing raft, Brazil; bamboo sailing-raft, Formosa; reed raft or canoe, L. Titicaca, Peru. The flat-bottomed boat from the Maldive Islands is little more than a raft.

Bark canoes (models) from Australia, Tierra del Fuego (South America), and North America.

Skin canoes: models of Eskimo *umiak*, or women's boat, and *kayaks*, one with no skin covering, to show the framework; model of Irish *curragh*, a canvas boat; full-sized coracle of tarred canvas on a frame, from South Wales, 1905. In the same case is a large stone in a wooden framework, used as an anchor for a *curragh*, from Galway.

Dug-out canoes (models) from South America, north-west coast of North America (the one over the case is a real canoe, not a model), and Africa.

Evolution of the plank boat. Dug-out canoes with the sides raised by planks laced on, New Zealand and Savage Island (Pacific); in the full-sized canoe, 23 feet long, from the Marshall Islands in the Pacific (over cases 99–106) the dug-out portion is a mere keel, the canoe being made up of planks laced or sewn together; other specimens from the Uganda Protectorate and India, consist of sewn planks, as does the full-sized canoe from the Solomon Islands, over cases 93 to 96; one or two models of boats of planks pegged together are shown, from the Maldive Islands.

Double canoes (models) from Manahiki and Hawaii (in the Pacific), Ceylon, West Africa.

Outrigger canoes (models) from Savage Island, Hawaii, New Guinea, North Borneo, Sulu Island (double outrigger), Maldive

Islands, Ceylon (some of the canoes already referred to also have outriggers). Vessels with weather boards, from the Malay Peninsula, are shown here.

Paddles (not models) from Africa and the islands of the Pacific.

Evolution of the rudder: models of canoes, boats, and ships, arranged to show the stages by which the steering paddle or oar developed into a rudder fixed at the side of the vessel, and this into a median rudder. Specimens from the Pacific, Burma, Java, Japan, and the Indian Ocean.

Sailing vessels (models), chiefly from the Indian Ocean and the East Indian Archipelago. The mat sails of the Pacific are shown in a double canoe from Manahiki. Lateen sails and square-rigged and fore-and-aft rigged vessels are shown. A model of an English corvette of about 1850 and of a barque of the same period may be mentioned.

Miscellaneous models of vessels of various types from the East Indies, China, etc.

Central Lobby.

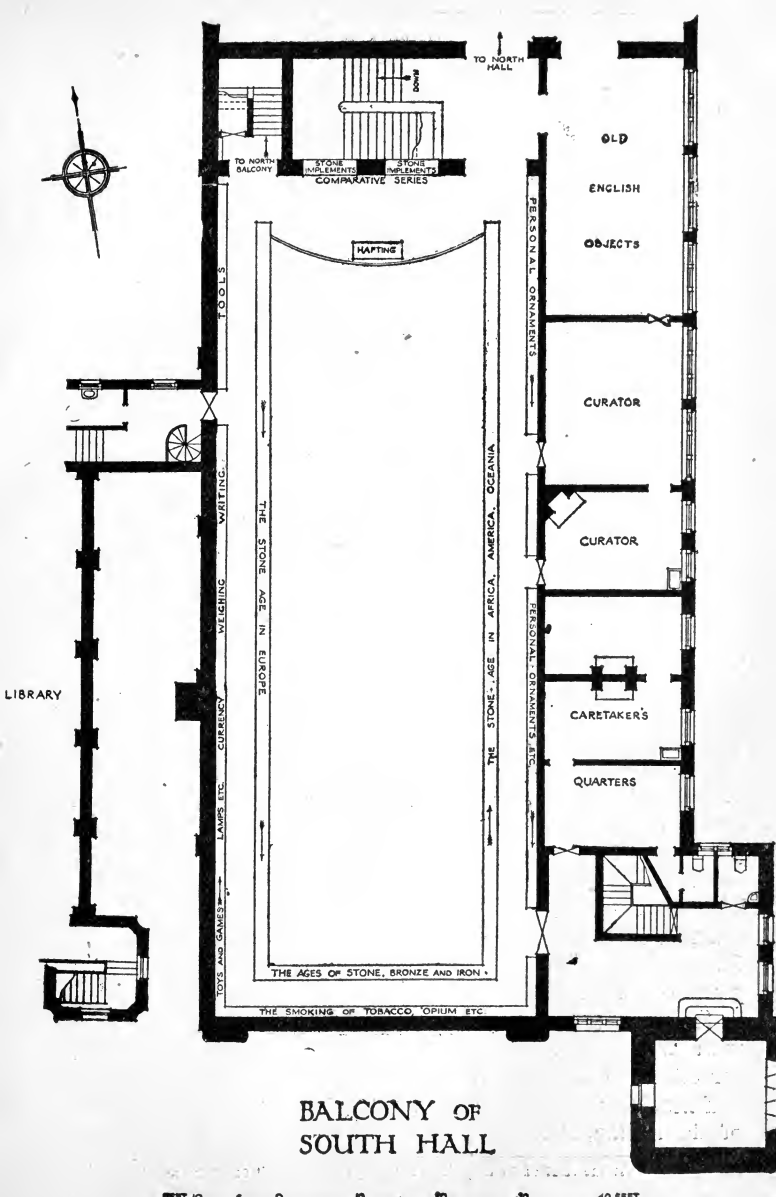
The chief exhibits here are the **stone lid of the coffin** of Imhotep, XXXth Dynasty, from Abydos, Egypt, and two large Burmese stone **images of Buddha.**

South Corridor.

In entering the corridor the visitor passes through the middle arch of a large **carved wooden archway from Jeypore,** India, the upper frieze of which represents the entrance to a Hindu temple.

Seats and head-rests. The large wall case contains (or will contain when certain re-arrangements are completed) a collection of seats and head-rests (or pillows) from various parts of the world.

Egyptian mummies. These are placed in the corridor for convenience, though this arrangement separates them from other objects in the Egyptian collection (see Magic and Religion section). The mummies are those of women as well as men. One is that of a priestess of Amen-Ra at Thebes, and dates from the XXVIth Dynasty, about 600


TO NORTH HALL
DOME
TO NORTH BALCONY
STONE IMPLEMENTS
STONE IMPLEMENTS
COMPARATIVE SERIES
OLD
ENGLISH
OBJECTS
PERSONAL ORNAMENTS
CURATOR
CURATOR
PERSONAL ORNAMENTS ETC.
CARETAKER'S
QUARTERS
HAFTING
TOOLS
WRITING
WEIGHING
CURRENCY
LAMPS ETC.
TOYS AND GAMES
THE STONE AGE IN EUROPE
THE STONE AGE IN AFRICA, AMERICA, OCEANIA
THE AGES OF STONE, BRONZE AND IRON
THE SMOKING OF TOBACCO, OPIUM ETC.
LIBRARY
BALCONY OF
SOUTH HALL
FEET 10 5 0 10 20 30 40 FEET

B.C. An older one, also probably of a priestess of Amen-Ra, dates from the XIXth Dynasty, about 1300 B.C. The mummy of a lady who lived during the XIXth Dynasty has a gilded face-mask, and several of the coffins are covered with paintings and hieroglyphics.

SOUTH BALCONY.

VII. ORNAMENTATION AND CLOTHING* OF THE PERSON.

[Wall Cases 1 to 28.]

This section begins with specimens and pictures illustrating the methods by which peoples in various stages of culture decorate the skin, by painting, scarifying, or tattooing. Keeping in the fashion is often a painful process, involving distortion of parts of the body, or the perforation of lips, nose, or ears for the attachment of ornaments. Necklets, pendants, arm rings, etc., are more easily attached and do not involve deformation. In the case of savage and barbaric peoples, it is committing an injustice to regard their personal ornaments entirely as vanities, since in very many instances they have a social or magical significance, and are worn as amulets and talismans.

Associated with the ornamentation of the person is the matter of personal cleanliness, and toilet operations in general. These are illustrated in a case at the end of the present section.

The specimens and pictures are grouped under the following headings :—

Painting and powdering : specimens from the Andaman Islands, Africa, Ancient Egypt, and elsewhere, together with powder-puff and rouge from nearer home. (Cases 1, 2.)

Scarifying : specimens from Australia and Africa, together with illustrations showing the extraordinary disfigurements sometimes produced. (Case 2.)

Tattooing : specimens from New Zealand and other parts of the Pacific, Borneo, Burma, India, Tunis, Japan, and the

* At the time of writing there is no separate exhibit of clothing.

London Docks, including a modern electrical apparatus. Amongst the specimens are pattern-books of professional tattooers as well as instruments and models. (Cases 1, 2.)

Tooth chipping, filing, inlaying, and colouring (chiefly pictures). (Case 3.)

Deformation of the skull, showing, in particular, examples of marked distortion in two skulls from the west coast of South America. (Case 5.)

Deformation of the feet, especially as practised in China. (Case 6.)

Constriction of the waist in New Guinea and elsewhere. (Case 6.)

Ear ornaments, plugs, pins, rings, and pendants from the Pacific, America, Africa, Asia, Europe. (Cases 3, 4.)

Lip plugs, from East Africa, British Columbia, and the Eskimo of Alaska. (Case 3.)

Nose sticks, plugs, and rings, chiefly from the Pacific and India. (Case 4.)

Breast ornaments and pendants, chiefly of shell and of boars' tusks, from the Pacific ; jade *tikis* from New Zealand ; charm boxes from Tibet. (Cases 5, 6.)

Necklets and neck rings of seeds, feathers, teeth, shells, beads, brass, silver, etc., from many regions. (Cases 7 to 14.)

Armlets, of woven material, of coconut shell, wood, stone, shell, ivory, bone, brass, silver, etc., from many regions. (Cases 15, 16.)

Leglets, finger-rings, toe-rings, and **brooches.** Models of many of the great diamonds are also shown in this case, as are glass and other imitations of native ornaments, made in Austria for export. (Cases 17, 18.)

Waistbands and body belts of bark, rattan, shells, beads, etc., from many regions ; pubic coverings and "skirts" of leaf, shell, fibre, skin, etc., from Australia, New Guinea, Africa, etc. (Cases 19 to 22.)

Combs from most parts of the world. (Cases 23, 24.)

Headbands and simple head-dresses from Australia and the Pacific Islands, Africa, and elsewhere. (Cases 25, 26.)

Specimens and pictures illustrating **hair-dressing** and appliances, in New Guinea, Africa, etc., wigs and pig-tails from Fiji, New Guinea, China, etc. (Case 27.)

Toilet appliances, including: Chinese ear protectors, ear-picks, tooth-picks, strigils, and back scratchers; a bamboo flea-trap, China; eye shades from the Eskimo of Alaska, and from the Solomon Islands; spectacles from China; mirrors of bronze, steel, and glass, from Ancient Egypt and Ancient Cyprus, China, Japan, and elsewhere. (Case 28.)

VIII. FLY-WHISKS AND FANS.

[Cases 29, 30.]

Fly-whisks from Africa and India; **fans** from Tahiti, Benin, Japan (including war-fans), China, and several Old English fans, carved or painted.

IX. THE USE OF TOBACCO, OPIUM, AND OTHER NARCOTICS AND STIMULANTS.

[Cases 31 to 42.]

Tobacco pipes from all parts of the world, and of practically all types. A series illustrating the evolution of the Indian narghile from the simple coconut water-pipe. Accessories used in tobacco smoking. **Opium pipes** and accessories from China. **Snuff boxes** from Africa, Asia, and Europe.

Areca nut ("betel" nut) chewing: lime gourds, lime boxes, spatulas, pestles and mortars, and other accessories.

Kava drinking: kava bowls, cups, strainers, etc., from Fiji and the Caroline Islands.

Specimens from South America, illustrating **maté tea** drinking; **saké cup** and moustache-lifter, Ainu of Japan.

Beer-mugs, tankards, wine bottles, etc., chiefly European.

X. SPOONS, KNIVES, AND FORKS.

[Cases 43, 44.]

Spoons, ladles, etc., from all over the world, including primitive examples of shell, coconut-shell, horn, and other materials. Chinese chopsticks. **Knives** of shell, bamboo, etc., used by backward peoples, and some metal knives.

XI. TOYS, SPORTS, AND GAMES.

[Cases 45 to 50.]

Toys are represented by dolls, marionettes, toy whistles and rattles, models of carts, etc.

Sports include specimens of battledores and shuttlecocks, balls from various parts of the world, bat and trap for ball game, old quoits, old dart-board, mediæval bone skates found in London. **Games** of skill and chance are represented by dice, dominoes, chess-men, draughts-men, spillikins, cribbage boxes, game-boards for mancala, playing cards, etc. This is an undeveloped section.

XII. HEATING AND LIGHTING APPLIANCES.

[Cases 51 to 54.]

Hand and foot warmers from various civilised countries.

Rush-holders and **candlesticks** from China, Japan, Ireland, England.

Lamps, ranging from the open oil-lamps of soapstone, used by the Eskimo, to the highest types of closed lamps used in Europe before the employment of light oil (paraffin) for illumination. Specimens from North America (of shell), Borneo, West Africa, India, China, Holland, Belgium, Italy, Portugal, Scotland (crusie), are shown, and there is a series illustrating open and closed types of ancient earthenware lamps from Cyprus, Greece, Alexandria, and various Roman sites.

XIII. CURRENCY AND MONEY.

[Cases 55 to 58.]

Barter is exchange of possessions, pure and simple, and this method of carrying on commercial transactions still persists. In most regions, however, certain objects or materials (coins, etc., in civilised states) have come to be accepted as having a fixed value relatively to things that are bought and sold. In most instances the currency derives its value from the rarity of the material of which it is made, from the difficulty of obtaining it, or from the time and trouble required to manufacture it. The currency of backward races usually consists of ornaments, tools, weapons (often more or less conventionalised), and the raw materials of which these things may be made. Cakes of salt or tobacco and bricks of tea

have also been used. In Oceania, strings of shells and shell-discs are widely used as currency. In Africa, the forms of currency are particularly varied, including cowrie-shells, small mats, loaves of tobacco, cakes of salt, etc., but metal currency is more widely diffused. This may take the form of such useful objects as hoe-blades, rods and coils of brass wire, ingots of copper. In some cases the weapons are conventionalised, and this helps us to realise one way in which real money is developed out of currency. Some old Asiatic forms of currency are still more suggestive from this point of view. Thus the characteristic copper *cash* of China is derived from small knives, formerly used as currency. These were originally actual serviceable knives, but they became conventionalised and reduced in size. At the end of the handle was a hole for stringing the knives together, and by several stages the knife disappeared, leaving only the perforated part in the form of the *cash*. In Southern Asia, on the shores of the Indian Ocean, the fish-hook was once used as currency, and gave rise to small double rods of bronze or silver, quite unlike a fish-hook.

There is no doubt that Europe passed through stages of barter and the use of a varied form of currency similar to those referred to. When it was recognised that metals such as bronze, silver, and gold were more convenient for use as currency than most of the objects employed, these metals were made up in quantities which represented the approximate value of some pre-existing standard. Thus the ancient gold unit (the Talent of Homer) of 130 grains troy represented the value of an ox. In the lower units of currency, the bronze fish of Olbia afford evidence of the relationship of metal currency to a pre-existing natural unit — the fish themselves. In some cases, Greek coins bear upon one face a representation of an object that was probably at one time itself a form of currency.

Objects used as money.

Shells, beads and personal ornaments from Africa and Oceania ; salt and tobacco from Africa ; stamped brick of tea, Central Asia ; mat-money, Congo ; stone blades hafted

as axes, but not for use, British New Guinea; hoe-blade, spear, conventionalised spearhead, conventionalised throwing-knife, very small and useless arrow heads, etc., from various parts of Africa; reed shield, Solomon Islands; brass cannon from Borneo.

Lengths of brass and copper wire, heavy copper rod (Transvaal), iron armlets and "manilla" money, copper ingot crosses, all from various parts of Africa; silver ingot, stamped, China; bronze canoe-shaped ingot, Indo-China; bronze rings from the Swiss Lake Dwellings of the Bronze Age; tin ingots ("hat money"), Malay Peninsula; tin ingots in the form of animals (crocodile, tortoise, grasshopper), formerly used as money in the Malay Peninsula.

Old knife-money and copper "cash" (*sapec*) derived from it, China; old hoe-blade money (so-called "shirt money"), China; silver fish-hook money, Ceylon; silver *tical* and $\frac{1}{4}$ *tical*, Siam (this is silver rod bent and stamped).

Fish-shaped coins in bronze from Olbia, an ancient Greek colony on the north shore of the Black Sea.

Examples of emergency money in metal or paper.

XIV. METHODS OF PUNISHMENT, etc.

[Cases 59, 60.]

Rhinoceros-hide whip for punishing natives, Belgian Congo; old English cat-o'-nine-tails; Chinese cangue or neck-pillory and small wooden models showing Chinese punishments; slave irons, Africa; old English fetter locks, etc. Some samples of locks and keys.

See also the Spanish torture-chair in the recess in the North Hall.

XV. MEASURING, WEIGHING, etc.

[Cases 61 to 65.]

This section is at present quite undeveloped, and the specimens are few in number. They are classified to suggest the various series that could be arranged, and it is not pretended that there is at present any approach to an adequate treatment of the subjects.

Measuring length and capacity: a few Chinese measures; old oak measuring rod, $\frac{1}{2}$ ell, Flemish or old English; wooden

pace-stock, old English ; land surveying wheel, English, early 19th century.

Measuring time : spiral spill, time intervals marked, China ; water-clock, a brass bowl with a perforation, Ceylon ; several old English sand-glasses ; shepherd's pocket sundial from the Pyrenees ; Tibetan portable sundial, a marked staff ; English sundial plate ; compass sundial, China ; old Japanese clock.

Compasses : magnetic compasses, Chinese and old English.

Weighing : wooden bismers, Malay Peninsula and Norway ; Chinese and old English steelyard ; Roman bronze steelyard beam, found in London ; old English guinea and half-guinea testers

Scales from Ceylon and Holland ; scales, stone and brass *weights*, and a set of grading sieves, all used in the pearl market, Gulf of Manaar, Ceylon ; weights from Burma, Holland, etc.

Counting and recording : tallies from British New Guinea, China, Albania, France, England ; abacus, China, and two from Japan. Message stick, West Australia ; objects with owner's marks, Ainu of Yezo, Japan.

XVI. WRITING AND PRINTING.

[Cases 67 to 70.]

The object of this section is to illustrate some of the stages by which writing systems have developed from the pictorial representation of animals, objects, and scenes ; and also to illustrate the early steps in the development of printing. The specimens at present available are, however, barely adequate even for the treatment of the broad outlines of the subjects.

The tallies referred to in the previous section have a bearing upon the subject of the origin of writing, since they illustrate devices for making more or less permanent records, if only of numbers. The message-sticks of Australian aborigines, the practice of using owners' marks, and other simple methods of identifying or recording, whether by representative carving or painting, or by the use of conventional designs, all throw a light on the conditions which facilitated the development of true writing systems. The main stages are : (1) Picture-

writing, (2) conventionalised picture-writing, or hieroglyphics, (3) phonetic writing, in which the symbols stand for sounds, and not concrete objects. All the alphabetic systems at present in use have a common origin, the earliest-known system which can be regarded as the common "ancestor" being that of the Phœnicians. This was in full use in the first half of the 9th century B.C., and from it were apparently derived alphabets which in their turn gave origin to all the existing alphabets of Europe and Asia, as well as to others which have gone out of use. The theory of the development of the Phœnician alphabet from the ancient Egyptian writing is no longer widely held, but it has been suggested that the ancient Minoan (Cretan) linear signs gave rise to the alphabet of the Phœnicians. However that may be, our own writing is, through Roman and Greek, a direct descendant of the Phœnician.

The ancient Egyptians had, at an early period, reached the phonetic stage in their writing, and possessed, indeed, an alphabet; but this was used in combination with ideographic and syllabic signs, and therefore lost much of its value. The Assyrian cuneiform also reached the phonetic (and syllabic) stage, and, as adopted and modified by the Persians, gave rise to an alphabet; like the Egyptian, however, the cuneiform has no modern representative. Chinese writing is scarcely out of the hieroglyphic stage, though the signs are highly conventionalised; the Japanese have made their own syllabic system from a selected number of Chinese signs.

Printing had its origin in the use of metal or wooden stamps, on which the letters of inscriptions to be printed were carved in relief. The method appears to have been developed later in Europe than in China or Japan. In Europe, till towards the end of the 14th century, all books and documents were written by hand, though as early as the 12th century blocks or stamps appear to have been used for making imprints on vellum and cloth. By the first half of the 15th century the use of blocks for printing books was becoming well established, the blocks being often wood engravings, with or without text (*see* reproduction of block-book). Printing from blocks has persisted in China and Tibet till the present day, and examples of blocks and imprints are exhibited. Movable type was first

used in Europe about 1440, though the oldest surviving book printed from such type dates from 1457. The discoverer or inventor was probably Lourens Coster, of Haarlem, in Holland, and not Gutenberg of Mainz, for whom the credit is often claimed. Movable type appears to have been used in China as early as the end of the 11th century A.D., but evidence that the knowledge passed from Asia to Europe has not been brought forward.

The specimens exhibited include :—**carvings** of animals, one a cast of carved bone of the Old Stone Age (Cave Period), another an Eskimo ivory drill-bow, incised with animals and hunting scenes. Stone *churinga* from South Australia, carved with designs of the Emeu totem. Illustrations of North American Indian **pictographs.** Tablets with ancient Egyptian **hieroglyphs,** and illustrations of Babylonian and Assyrian cuneiform, showing stages in its development from the pictorial to the conventionalised ; illustrations of Easter Island, Maya, and Cretan hieroglyphs. Illustrations showing **phonetic signs** in ancient Egyptian and in cuneiform ; tables showing the similarity between linear Cretan signs and Phœnician characters ; comparative table to illustrate the origin of our **alphabet.**

Seals, some with inscriptions : Babylonian cylinder seal, ancient Egyptian seal impression. Chinese seals, bronze seals, Bengal, wax imprint of the Great Seal of James I.

Manuscripts, etc., chiefly from Asia, in writing systems derived from the Phœnician alphabet :—bone slab and bamboo slips, with script, Batak of Sumatra ; writings on copper, Burma ; palm-leaf books, Ceylon ; arabic writing, West Africa ; MS. book in Armenian.

Writing appliances : Roman stylus, found in London ; steel styli, Ceylon ; brushes, ink, inkpots, paper, etc., China and Japan ; piece of Pali MS. on palm-leaf, written with a stylus, Ceylon.

Block printing : wooden blocks, and imprints, Tibet and China ; facsimiles of pages of old block-book, printed in Holland in the 15th century.

Type-printing : volume of sermons printed in 1480 at Augsburg (the capital letters done by hand).

XVII. TOOLS.

[Cases 71 to 80.]

Most, but not all, of the implements in this section are carpenter's tools, and they are placed in their present position in order that they may be in proximity to the Stone Implements section. Other modern tools will be found in the latter section, in the series illustrating Methods of Hafting, and the Adoption of Iron, Steel, etc., by backward peoples.

The tools shown here are chiefly from Oceania, America, Africa, a few from China, Japan, and other eastern countries, and some old English types. The first case contains **knives** of bamboo, bone, ivory, teeth, shell, etc., many of them not being used in wood-working, the same being true of the stone-bladed and some other knives in the succeeding case. The knives are followed by **chisels, rasps, drills, saws, planes, adzes** (a number of them stone-bladed and two shell-bladed), **axes** (several stone-bladed), and **hammers.** Knives, adzes, and axes are best represented, as regards the number of types.

The **miscellaneous tools** include a pick with bone point, an ivory pulley, a snow shovel with bone blade, an arrow-straightener, and a bone and whalebone sieve for removing ice from a water hole, all from the Eskimo of the Arctic regions; red-deer antler pick, Stone Age in England (from Grime's Graves); an ivory wedge from the north-west coast of North America; iron-worker's bellows, Africa; wire-drawing apparatus, Congo; several old English tools, including spokeshaves, fire tongs, shears, cobblers' tools, etc.

XVIII. THE AGES OF STONE, BRONZE, AND IRON.

This section illustrates the uses made of stone by prehistoric man in Europe and elsewhere, and also by modern backward peoples. Several cases are devoted to certain important general points in connection with the uses of stone and methods of working it, but the arrangement of most of the specimens from our own country and the continent is chronological; this series, also, goes beyond the Stone Age through the age of Bronze to that of Iron. The Bronze Age

collection is small, however, whilst the Iron Age is represented mainly by illustrations.

In the case of modern Stone Age peoples whose implements may still be obtained in a complete state, examples of hafted stones will be found in the section of War and the Chase, and also amongst the tools in the balcony wall-cases adjacent to the beginning of the Stone Implements section. With few exceptions, only haftless implements are shown in the present section, though there is a special series to illustrate methods of hafting.

The subjects treated of in this section are so fully discussed in the special handbook relating to it ("From Stone to Steel")* that it is unnecessary to do more here than to indicate the lines of arrangement and the scope of the collection.

Index Series of Stone Implements.

[Cases A to D, and 1 to 4.]

This includes a **comparative series** of implements from all parts of the world, of palæolithic and neolithic types, of various ages, and of all the chief forms. The series is in the cases under the arches at the upper end of the balcony. In an adjacent table case is a series illustrating **methods of hafting** stone implements, the specimens being chiefly tools and weapons of modern Stone Age peoples. The **manufacture of stone implements** is at present the first series in the handrail cases, and here are illustrated such points as the procuring and flaking of flint, flaking-tools, the signs of human workmanship, the polishing, perforating, and cutting of stone implements. Several specimens are selected to show fine workmanship in flint chipping, the best of these being an exceptionally beautiful prehistoric flint knife from Egypt. Stages in the manufacture of implements are illustrated by specimens from Cushendall, Ireland (axe heads). Other series illustrate the uses of stone other than flint, and the **patination** and other changes that have been undergone by flint implements through the action of natural causes.

* This is at present out of print, but it is hoped to issue a new edition before long.

Eoliths.

[Case 6.]

These are not conclusively shown to be of human workmanship, though many observers accept them as implements. A small collection, chiefly of specimens from the North Downs, is shown. In the same case are two specimens illustrating the effects of pressure, produced artificially, in breaking flint into forms resembling two of the Eolithic types; it is suggested that under natural conditions pieces of flint may be subjected to similar pressures, and that many so-called eoliths may thus be formed by natural causes.

The Palæolithic (or Old Stone) Age.

[Cases 7 to 18.]

Well-formed flint implements, chipped only and never polished. Two chief periods usually recognised, and these are further sub-divided. A small introductory series illustrates the **classification of the Old Stone Age,** by means of implements typical of the several stages or epochs. This is followed by the main collection of "river-drift" implements, arranged according to localities and types, and not sub-divided into the stages referred to in the classificatory series.

Implements of the **River-drift Period.** [Cases 8 to 14.]

Most of the specimens are from the gravel of the 100ft. terrace of the Thames, at Swanscombe, Kent. A few are from the same gravels at Northfleet and Galley Hill. Other localities are represented by specimens from Maidenhead, Aylesford, Warren Hill, Brandon, Lakenheath, Broom (Devonshire), and elsewhere.

A small collection of river-drift implements from France (St. Acheul, Amiens, and Abbeville).

Animals of the Palæolithic Age.

Bones and teeth of mammoth, elephant, rhinoceros, cave bear, etc., chiefly from caves in Devonshire.

Bone and teeth of reindeer, horse, etc., from the French caves.

Implements, etc., of the **Cave Period.** (Cases 15 to 18.)

At the beginning of this series is a piece of the floor of the cave of Les Eyzies (Dordogne, France), showing stalagmite and cave-earth, in which are embedded bones and flakes. There are also a few specimens from English caves. The rest of the collection is arranged under the several epochs into which the Cave Period is divided.

Mousterian Epoch. Flint implements from Le Moustier. (*See also* a number of specimens from the 50ft. terrace of the Thames, near Northfleet, at the end of the river drift series.)

Aurignacian Epoch. Implements of flint, and bone, from the Valley of the Vézère.

Solutrean Epoch. Implements (and casts of implements) from Volgu and Laugerie Haute.

Madelainean Epoch. Implements of flint, and bone, from La Madelaine, Bruniquel, Les Eyzies, and Laugerie Basse.

The Art of the Cave men.

Casts of carvings and engravings from La Madeleine, Laugerie Basse, etc.; copies of a few of the cave paintings (other casts and copies may be seen in the Decorative Art section).

The Neolithic (or New Stone) Age.

[Cases 19 to 31.]

Implements made not only by chipping, but grinding and polishing practised. More variety in the form of the implements, and many of them certainly made for hafting. Neolithic man cultivated the soil and had several kinds of domesticated animals, whereas Palæolithic man was wholly a hunter and fisherman.

Neolithic implements. Specimens from several parts of **England** (Sussex Downs, Cissbury, Grime's Graves, and from the Thames) and **Ireland** illustrate the Neolithic Age in the British Isles. There are also a few specimens from France, Italy, and Greece. A few implements and shells from the kitchen-middens of **Denmark** are shown, and the more advanced Neolithic Age in Denmark (Cases 28 and 29) is represented by many finely-made axe-heads, adze-heads, gouges, axe-hammers, etc. Specimens from the **Swiss Lake Dwellings** include not only implements of stone and bone,

but also charred remains of food such as wheat, millet, apples, etc., of yarn, and of woven material and string-work (Cases 30 and 31).

The Age of Bronze.

[Cases 32 to 36.]

A small series illustrates the probable stages of **transition** from **stone to bronze** by means of modern as well as ancient specimens; a fine Eskimo knife with blade of hammered copper may be noted. Another series shows the passage of the flat bronze celt to the palstave on the one hand and the socketed celt on the other. There is also shown a number of celts from England, Wales, Ireland, Brittany; and dagger and rapier blades, spear-heads, fish-hooks, knives, a sickle, pins, pendants, etc., from England, Ireland, Cyprus, and the Swiss Lake Dwellings.

The Early Iron Age.

[Cases 37, 38.]

A few bronze arrow-heads and fibulæ. Several illustrations are shown.

The Stone Age in Egypt.

[Cases 39 to 42.]

A number of flint implements, of both palæolithic and neolithic types from various sites, including many arrow-heads and knives from the Fayum. (*See also* the fine flint knife in the Index Series.) Armlet of chert, polished (from the tomb in the hall below). Several slate palettes (probably for face paint), one with small pebble for grinding with, near Luxor. Specimens illustrating the process of manufacture of small alabaster pots from Memphis (Roman period). A few implements of copper and bronze (arrow-heads, axe-heads, knife, etc.) are also shown at the end of this series.

The Stone Age in Africa South of the Sahara.

[Cases 43 to 45.]

Implements of quartzite, of palæolithic types (but of unknown age), from Somaliland and Cape Colony; worked

flakes from the Victoria Falls. Implements from the cataract region of the Congo, including several arrow-heads. Flakes and points, etc., from Kimberley, Cape flats, and a few Bushman flakes. Obsidian implements and flakes from British East Africa. Stone axe-heads from West Africa (Nigeria, Ashanti, Gold Coast).

The Stone Age in Asia.

[Case 46.]

Palæolithic and neolithic types from India. Arrow-heads from Japan.

The Stone Age in America.

[Cases 47 to 53.]

North America.—Implements of the chief types from all parts, including finely-worked spear and arrow-heads and knife blades; obsidian implements from Mexico; Eskimo stone points and blades. Series showing stages in the manufacture of arrow-heads of quartzite, from Washington, D.C.

West Indies.—Celts of stone, and of shell. A considerable number of Carib stone implements and shaped stones of unknown use.

South America.—Implements of various types from Uruguay, Argentina, the Upper Amazon, Peru, Ecuador, Guiana, etc. Bolas stones. A few ancient Peruvian implements of copper and bronze are shown here.

The Stone Age in Oceania.

[Cases 54 to 57.]

Specimens without hafts (chiefly celts) from New Zealand, Chatham Islands, Easter Island, Pitcairn Island, Tahiti, Samoa, Hervey Islands, Caroline Islands, New Caledonia, Fiji, Admiralty Islands, Solomon Islands, New Guinea, Australia. Flakes and chipped implements from Tasmania. Some hafted Australian specimens are shown, but the Tasmanians never got so far as to provide their stone implements with hafts.

The Abrupt Transition from Stone to Steel.

[Case 58.]

Axes, clubs, fish-hooks, knives, arrows, from Oceania and America, showing the use made of iron and steel (sometimes already made into axe-heads, etc.) by Stone Age peoples brought into contact with civilised man. Some glass spear-heads from Australia, and an arrow from Tierra del Fuego, with a point of glass, are also shown here.

Modern Flint-Working in Europe.

[Cases 59, 60.]

Pick, hammers, and other flint-workers' tools from Brandon ; prehistoric flint-miner's pick of deer antler from a near locality (Grime's Graves), for comparison. Flint cores, flakes, gun-flints, and tinder-box flints from Brandon. Gun-flints from France and Albania.

Dressed flint for ornamental work on walls ; brass tinder box with flint and steel, Holland ; flint-lock pistol. In this case also are an iron pick used in getting flint, an iron fabricator, flint flakes and gun-flints from the Belgian Congo.

Counterfeits and Forgeries of Flint Implements.

[Cases 61, 62.]

Imitations made by workers at Brandon. A collection of forgeries of neolithic types, by Flint Jack. A collection of forgeries of palæolithic and neolithic types made probably in London ; some of the specimens are shown as they were offered for sale, others have been washed or boiled in a solution of washing soda, to show the effect on the polish and colour.

Side Room.

XIX. OLD ENGLISH OBJECTS.

("*Bygones.*")

In the room opening opposite the top of the main stairs is a collection of old English objects to which the term Bygones may conveniently be applied, though some of them are old-fashioned rather than obsolete.

The collection includes :—Appliances used in connection with lighting, heating, and cooking, such as tinder-boxes,

rush-nips, candle-holders, lanterns, snuffers, fire-dogs, Sussex fire-backs, pot-hangers, spits, trivets, toasters, bed-warmers, warming-pans, etc.; objects and appliances associated with the preparing, preserving, and serving of food, such as pig-scrapers, sugar-nippers, nutcrackers, apple-scoops, spoons, ladles, skimmers, knives, gingerbread moulds, butter-rollers, stone cheese-press weight; appliances associated with the toilet, or the treatment of clothing, such as patch-boxes, wig-curlers, hand-mangle, goffering-irons, glass linen-rubber, crimping-block and roller, shoe-buckles; appliances used in fancy-work, or the production of textiles, such as bobbin and skein winders, lace bobbins, ivory knitting-stick, straw-mangle and straw-splitter, flax comb, teazel-frame (part of); objects associated with cattle, horses, farm-work, and game-preserving, such as sheep and horse bells, shepherd's crook, bullock shoes, flail, spring-guns, animal traps; also smoking appliances, weights, money scales, sand-glasses, spectacles, locks and keys, tipstaves, rattles, baby-runner, etc. At the time of writing the collection of Old English pottery and other vessels used to contain liquids or solids is in the South Corridor, but it will shortly be removed to the same room as the specimens just enumerated. It includes :—leather bottles, black jacks, horn mugs, harvest barrels, wooden platters, pewter tankards, etc.; bronze skillets; pitchers, porringers, ale-jugs, etc., of earthenware; and a number of wine bottles.

North Hall.

XX. MAN AND THE GREAT APES.*

Man betrays his close relationship with the existing great apes at all points of his anatomy, and, except as regards size and quality of brain, the differences are relatively small. His nearest allies are the Chimpanzee, Gorilla, and Orang-utan, which, like man himself, are giant apes, whilst the Gibbons are smaller members of the same group. The Old-World monkeys are more distant cousins, and those of the New World are still further removed.

* A special handbook to this section was issued early in 1920 (The Ascent of Man.)

Fossil remains bearing upon the evolution of man are very scarce, but in 1891 there were discovered in Java some bones of an animal which was something more than ape, but not quite man. To this type the name *Pithecanthropus erectus* has been given. So far, almost all that is known of it is the top of the skull, but its intermediate character is indicated by the fact that authorities differ as to whether it was a large gibbon or a low type of man.

During the Palæolithic Age (*see* page 87) the inhabitants of Europe were not all of one type, and there are evidences of a series of waves of invasion. Skulls and other bones of more than one distinct race of man have been found, and first place may be given here to the portions of the human skull found in 1912 (mainly), at Piltdown, in Sussex. The remains afford evidence that there was living in our own country, in Pleistocene times, a type of man with a well-developed brain, but with a lower jaw so much like that of a chimpanzee that some investigators believe the skull and the jaw to belong to two different animals—one a man, the other an ape. The name of *Eoanthropus dawsoni* has been given to the type, which has important bearings on the study of the origin of man.

In 1907 there was found at Mauer, near Heidelberg, in a Pleistocene deposit, a lower jaw so massive as to be scarcely human, though the teeth are not larger or more primitive than those of some modern races. The name of *Homo heidelbergensis* has been given to this form, which may have been intermediate in character between *Pithecanthropus* and the men of Mousterian times. Several skeletons have been found in deposits of the Mousterian epoch, and although the remains are those of undoubted men, the skulls present features which bring them nearer to the ape than any existing race. Amongst these characters are the prominent and continuous ridge over the eye-sockets, the receding forehead, the great size and breadth of the nasal opening, and, in the lower jaw, the absence of the projection which forms the chin. The brain was large, however, sometimes even larger than the average of the modern European. To the type of man having the above characters the name *Homo neanderthalensis* is sometimes given, to distinguish him from the modern *H. sapiens*. This

specific name is derived from the locality in Prussia, where the first skeleton was found. To the same type the names of *H. mousteriensis* and *H. primigenius* have been applied.

Other remains of Palæolithic man have been found, but all those of later date than Mousterian times are regarded as belonging to the same type as the men of our own day.

The Apes and Man.

[Cases 1 to 6 and Table Case.]

Mounted specimens of Gibbon (male), Orang-utan (male and female), and Chimpanzee (male). Small model of male Gorilla.

Hands and **feet** (casts) of Gorilla, Chimpanzee, and Orang.

Skeletons of Gibbon, Orang-utan (male and female), Chimpanzee, Gorilla (male and female), and Man.

[Large Table Case.]

Skulls of Gibbon, Orang-utan, Chimpanzee, Gorilla, Negro, Papuan, for comparison of shape of head, brow-ridges, jaws, etc.

Teeth. Skulls of male Gorilla, young and adult Chimpanzee, and Man, to show the teeth of the upper and lower jaws in position. The upper teeth, left side, of an Orang, and the upper and lower teeth, left side, from the skull of an ancient Saxon.

Brain. Casts of the interior of the skull (brain case) of Siamang (a large kind of Gibbon), Orang-utan, Chimpanzee, Gorilla, early Man (Gibraltar skull), and modern Man, to show form and size of brain in each case. Wooden blocks, made to scale, to represent the progression in size of brain from the apes, through low types of man, to modern man. Skulls of a Gorilla and a Man, in section, to show form and size of brain cavity in the two cases.

Early Man (casts). Pithecanthropus skull, as found; Piltdown skull and lower jaw, restored; Heidelberg jaw. Lower jaws :—Piltdown, Heidelberg, Spy (Mousterian man), Saxon, and half of the lower jaw of an Orang, for comparison. Mousterian man :—Neanderthal, Gibraltar, Le Moustier, La Chapelle.

Modern types of Man (casts). Cro-Magnon and Combe-Capelle skulls (both Aurignacian); ancient Saxon and modern Australian aboriginal.

Classification of Modern Races.

[Cases 7 to 9.]

The specimens and illustrations shown in this case are not intended to serve as a guide to the numerous divisions and subdivisions of mankind, but to aid the visitor in understanding the main physical characters that are used in classification. In some of the characters the differences are estimated qualitatively rather than quantitatively, whilst in others, methods and instruments of exact measurement come into play. Anthropometry is the name given to the science of measurement as applied to man, and it does not confine itself to heads or skulls, but deals with many other parts of the body or skeleton. For various reasons, however, the skull takes a very prominent place in the study of man from the physical standpoint (Physical Anthropology), and at present almost the only specimens shown in the series under review are the skulls of various types of man. Illustrations are necessarily used for most of the characters that can be noted on living individuals.

One of the most obvious features, the **colour of the skin,** is not a reliable guide in the classification of mankind into main groups, though the terms white, yellow, and black, will bring a large proportion of the present population of the earth into three apparently natural groups. Such a classification is far from complete, however, and there are some dark-brown, and even black, peoples who are more closely allied to the white races than they are to the black or brown races whose colour they share. As means of making a more satisfactory division of mankind into main groups, it is very generally agreed that the *nature* (not the colour) of the **hair** may be taken as a trustworthy guide. There are three chief kinds of hair, and, although there is sometimes a difficulty in deciding to which of two of these a given sample, or head, of hair belongs, this is exceptional. Mankind may, then, be classified as frizzly or woolly-haired (Ulotrichi), to which the negroes belong; wavy-haired (Cymotrichi), as in Europeans and others; and straight-haired (Leiotrichi), like the Chinese and American Indians. In skin-colour the frizzly-haired peoples range from

yellow through brown to black. Wavy-haired peoples are in the main white, but many are light-brown, and the Australian aborigines, who belong to this group, are nearly black in colour. The straight-haired peoples are typically yellow, though many are of a lighter or darker shade of brown. The curly hair often seen in white people must not be confused with the very closely coiled hair of the Ulotrichi, nor the "straight" hair which often occurs in the first-named group with the coarse, lank hair of the Leiotrichi.

The **form of the head,** or skull, takes next place of importance in most classifications, though there is some difference of opinion as to the reliance that can be placed upon it. As a rule it is the ratio of breadth to length, expressed as a percentage, which is made use of, and this is called the cephalic index (or cranial index if the measurements are taken from the skull, and not from the head). The formula for obtaining the index is $\frac{\text{breadth} \times 100}{\text{length}}$, the measurements being taken from points that have been chosen for general acceptance as being liable to little variation. The breadth is always more than half the length, and rarely equal to it, nearly all cephalic indices lying between 65 and 90. Skulls or heads in which the index is below 78 are called *dolichocephalic*, whilst those above 78 are *brachycephalic*—long headed and short-headed, respectively. Both forms of head are widely spread, and may be found together in the same or adjacent areas. On the other hand, there is considerable uniformity in the head form of peoples who have other features in common. As examples, the Mongoloid peoples are typically brachycephalic, whilst negroes are mainly dolichocephalic.

The cephalic index relates only to two dimensions of the skull, and there are variations in shape which find no expression in this index. Skulls with high and low vaults, keeled or scaphoid forms, and other types are shown in the case. The receding forehead found especially in some of the lower races, is often associated with heavy brow-ridges.

In the face, a character which is regarded as "low," is the protrusion of the **jaws** to form something approaching a snout. The condition is called *prognathism*, and it is opposed

to *orthognathism*, when the jaws do not protrude. Prognathism is often associated with thick everted lips, which exaggerate the feature.

The **nose** may be prominent or flat, and broad or narrow, and the nasal opening in the skull gives an indication of the width and height of the nose itself. The nasal index expresses the relation of width to height, the greater the breadth the higher the index. The wide-nosed Australian aborigines have, therefore, a high nasal index, and this is one of several low characters found in this race.

The relation of height to width of the **orbit** or eye-socket may also be expressed as an index, though no great importance is attached to this index in classification.

Attention may be called here to the considerable range in breadth of the face, a broad face being usually associated with a broad skull, and vice versa.

It should be noted that in obtaining angles and indices, the measurements are made from points of the skull which are known to all investigators, and most of these points will be found indicated on specimens in the case.

Visitors should compare and contrast the Australian aborigine's skull with that of the ancient Saxon—the former will be found to present features which bring it distinctly nearer to the Neanderthal type, and therefore to the ape, than is the large well-formed skull of the Saxon, though the latter is some 1,500 years older. The Australian skull presents heavy brow-ridges, a receding forehead, small brain capacity, wide nasal opening, large orbits, and protruding jaws (prognathous), and contrasts with the Saxon skull in all these features.

Stature is a feature which is only of secondary importance in classification, though tallness or shortness is characteristic of some of the sub-divisions of mankind.

ZOOLOGICAL DEPARTMENT.

The collections in this department are at present divided into the following sections:—A "Survey of the Animal Kingdom" (on the balcony of the North Hall) succinctly illustrates the structure and classification of animals, and serves as an introduction to the remainder of the collections. The section entitled "Evolution of Animals" deals with evolution and evolution theories; "Animal Locomotion" with adaptations for locomotion; and "Animal Defences" with the structures, colours, and modes of life concerned with the defences of animals. A small exhibit of "Living Animals" (mostly British marine and freshwater organisms, and reptiles, amphibians, and insect larvæ) serves to remind the visitor that the study of zoology is not confined to dead things. There is a large collection of Birds, a case specially arranged to serve as an introduction to the "Study of Birds' Eggs," and Students' Reference Collections of insects and birds' eggs. Handbooks to several of these sections are either already published or are in course of preparation (see back of cover).

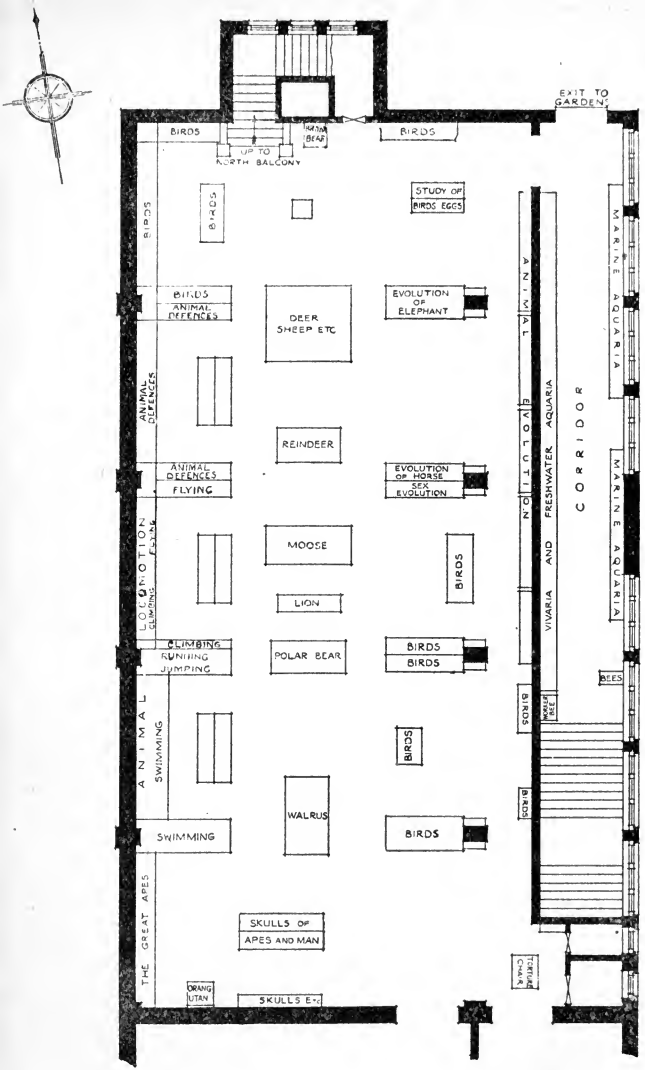
Although an examination of the collections ought logically to begin with the Survey of the Animal Kingdom, the visitor will probably first approach several large central exhibits which occupy the middle line of the ground floor of the Natural History Hall, and these will therefore be first described.

North Hall.

I. CENTRAL EXHIBITS.

Large Mammals.

The **Walrus** (*Trichechus rosmarus*). This huge animal will be recognised at once by its large canine teeth (tusks), which project downwards from the upper jaw, and by its flipper-like limbs. The specimen here shown is eight and a half feet in length, but some examples may reach as much as twelve feet. The walrus is confined to the Arctic regions. On account of the modification of its limbs into swimming flippers, the animal moves clumsily on land. The large canine teeth are



UPPER OR NORTH HALL

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used as weapons of offence and defence as well as for raking food (molluscs, etc.) out of the mud, and they are also used to assist the animal in climbing out of the water on to the ice. The walrus is an inoffensive animal except when provoked.

The **Polar Bear** (*Ursus maritimus*) differs from all other bears in having white hair, and also from the greater number of white animals in retaining its white coat throughout the year, instead of changing it in the summer for one of a darker colour. This bear, which is found in the Arctic regions, feeds chiefly on seals, porpoises, and fish. The specimen exhibited is mounted as though it was in the act of killing a seal.

The **Lion** (*Felis leo*) differs from all other cats, with the exception of the puma of America, in being of a tawny yellow colour. The other cats are spotted or striped, and the cubs of the lion are also marked in this way. The mane which gives to the male lion his majestic appearance is only present in that sex. At present the lion ranges over the whole of Africa from Cape Colony to Abyssinia and Algeria, although in civilised districts it is almost or completely exterminated ; in Asia it ranges through Mesopotamia and Persia, to north-western India, where it is upon the verge of extinction.

The **Elk** or **Moose** (*Alces machlis*). This magnificent animal is the largest existing member of the deer family. It carries its neck horizontally, as shown in the specimen. The male possesses enormous antlers, which sometimes weigh as much as 60 lbs. and these, like the antlers of other deer, are shed every year. The elk feeds chiefly upon leaves and twigs of trees. It is found in north-eastern Europe and northern Asia, and as far south as Prussia, the Caucasus, and north China ; it ranges also over Arctic America to Maine on the east and to British Columbia on the west. The specimen shown is from Canada.

The **Reindeer** (*Rangifer tarandus*) is distinguished from all other deer by the presence of antlers in the female as well as in the male ; and the antlers are not shed. The Old World reindeer ranges over northern Europe and Asia from northern Norway and Sweden eastwards. A variety found in Canada and Alaska is known as the Caribou, and the specimens

exhibited are of this variety. Unlike the Old World reindeer, the caribou is not tamed.

The **Virginian Deer** (*Cariacus virginianus*), the **Mule Deer** (*Cariacus macrotis*), the **Rocky Mountain Goat** (*Haploceros montanus*) and the **Rocky Mountain Sheep** (*Ovis montana*) are contained in the largest of the central cases. The Virginian and mule deer (the latter is so called on account of the length of its ears) are found over the greater part of North America. The Rocky Mountain goat is not a true goat, but is really a goat-like antelope, allied to the chamois. It will at once be recognised in the case by its white coat, which admirably harmonises with the snow-covered background of its higher haunts. It is one of the few mammals which remain white all the year round. The Rocky Mountain sheep is the only species of wild sheep found in America.

II. THE STUDY OF BIRDS' EGGS.

This subject is dealt with in a table-case, which is at present placed behind and to the right of the large central case last mentioned. This exhibition is designed to encourage intelligent observation, rather than mere collecting, of birds' eggs, by illustrating some of the many interesting facts which may be learned by study of their characters. The subject is treated under the following heads :—The varied colouring of eggs, protective colouring of eggs, clutches, size of eggs in comparison with that of the birds, forms of eggs, grain of the egg-shell. A handbook to this section deals fully with the subject. Attention may be directed to the specimens illustrating the protective colouring of eggs.

III. ANIMAL LOCOMOTION.

This section, which occupies two bays on one side of the ground floor of this hall (cases 10–32), is designed to illustrate the relationship which exists between modes of locomotion and structure. The way in which an animal swims, or climbs, or flies, is always of interest, and the specimens in this series are so arranged and labelled as to show the various methods by which locomotion is effected, and the adaptations associated with each method.

The interest of the section will be enhanced if the following points be borne in mind. The different species of a group of related animals may each become adapted for different modes of life. For example, a group may be composed of species each of which is specialised for a particular mode of locomotion ; thus, one is specialised for climbing, another for running, or it may be for jumping or swimming or flying, although all these species are descended from one "generalised" ancestor. To this phenomenon, which is common in many groups of animals, the term *divergence* has been applied. Since, however, this divergence has gone on in different groups of animals, it follows that many species which are quite unrelated (or very distantly related) have independently become adapted for a similar mode of life, as for example the fishes and the whales. Now, as similarity in habits usually leads in the course of evolution to similarity in appearance, it follows that many animals not related appear to resemble one another, as in the case of the fishes and whales, which have acquired the torpedo-shaped body and fin-like appendages quite independently, in response to the needs of an aquatic life. To this phenomenon the term *convergence* is applied. If the principles of divergence and convergence be clearly understood, the interest and value of the locomotion series will be better appreciated.

The broad outlines of the subject are dealt with in the wall-cases of the bays. Details are treated in the table-cases in the centres of the bays, and examination of these table-cases may be omitted by the visitor who is unable to devote a large amount of time to the collections. The section, for which a special handbook has been issued, is divided into the following series :—

Creeping.

[Case 10.]

Creeping animals are here understood to be such as move along a firm surface without the aid of paired jointed limbs of the kind found in a lizard or dog. The sea-urchin, which creeps by means of numerous "tube-feet" is an example The snail glides along upon its broad flat "foot." The

octopus creeps with the aid of the sucking cups upon its tentacles. The snakes glide rapidly on the ground or on trees by means of the broad overlapping scales of the lower part of the body.

Swimming.

[Cases 10 to 18.]

The modes of swimming practised by animals are very various, and only the more important examples can be shown. Amongst others are exhibited the jelly-fish, which swims by rhythmical contractions of its umbrella-shaped body; the squid and cuttle-fish, which can swim rapidly backwards by forcing jets of water through their siphons; and the prawn, which darts backward, when disturbed, by a sudden flexure of its broad flat abdomen. Different kinds of fishes, amphibians, and reptiles are shown, and their particular modes of locomotion indicated. A small model of a restoration of the great extinct *Ichthyosaurus* gives some idea of the probable form in life of this reptile. Particular attention may be drawn to the small models of whales, and to the series of swimming and diving birds.

Running.

[Case 19.]

Some of the more important structural features of the horse, which is one of the most highly specialised of running animals, are illustrated, and a small statuette of the racehorse Sysonby shows an attitude of the limbs in a horse when galloping. The hunting leopard, which, unlike other cats, runs down its prey, is, for short distances, probably the swiftest of all mammals; its long legs will be noted. A roe deer is shown as an example of a running deer. The rhea is an example of a bird whose wings have become useless for flight *pari passu* with the development of great running power.

Jumping.

[Case 20.]

In all jumping animals the mechanical principle is the same. A vigorous thrust is given by some portion of the body upon the ground, and the animal is thus projected forward. The

cockle affords an instance ; the " foot " is bent in an elbow-like fashion, and is straightened out vigorously when the animal wishes to move from one place to another. In the Mammalia the long and strong hind legs form the jumping organs ; the kangaroo and the jerboa are familiar examples from two very distinct groups, the former belonging to the Marsupialia and the latter to the Rodentia.

Climbing.

[Cases 21 to 25.]

The power of climbing not only enables an animal to retreat from foes upon the ground, but may also, in the case of an arboreal form, bring within its reach the store of food, such as leaves and fruits, borne by the trees. Again, a climbing animal can make its nest on rocks or in trees, and there bring up its young with greater safety than on the ground. There are many kinds of climbing animals, and only a few of the more instructive examples can be shown. Both the common green tree-frog and the gecko climb with the aid of adhesive discs upon the toes. In each foot of the chamæleon two of the five toes are opposable to the other three, and the foot is thus converted into an efficient grasping organ. A similar modification is found in the parrot, where two of the four toes are opposed to the other two ; in the fore-foot of the koala, again, two toes are opposable to the other three. In the well-known opossum, the terminal part of the muscular tail is devoid of hair, so that the animal is able to obtain a firm hold of the branches of trees, and the same modification occurs in the spider monkey. The most highly specialised climbing animals are the sloths, of which the two-toed sloth is shown. The feet are reduced to mere hooks which enable the animal to cling upside-down to the branches of trees. The two-toed anteater has become specialised for an arboreal life in much the same way as the sloth.

Parachuting.

[Cases 26, 27.]

In all parachuting animals some portion of the body can be expanded so as to present a large surface of resistance to the air.

This expansion supports the animal for a longer or shorter period after it has launched itself forth. The part of the body from which the expansion is formed varies. In the flying-fishes it is formed by the greatly expanded pectoral fins. In the parachuting lizard *Draco volans*, a membranous expansion of each side of the body is supported by five or six ribs. In the parachuting mammals (of which are shown a phalanger, squirrel, and a cobego) a lateral extension of the skin of each side of the body forms the parachuting organ. It should be noted that the term " flying " given popularly to many of these animals is a misnomer, as they do not fly, but merely glide through the air after a preliminary leap, usually from a tree.

Flying.

[Cases 28 to 32.]

The power of flight has been acquired independently in four distinct groups of animals, viz., the bats amongst mammals, the birds, the extinct pterodactyles amongst reptiles, and the insects. In the bats, birds, and pterodactyles the wing is a very highly modified fore-limb, but in the insects the wings are developed as fold-like outgrowths of the body-wall, and thus differ fundamentally from the wings of the other flying animals. In the pterodactyle, one toe (the 5th) on each fore-foot is enormously elongated, and each wing membrane extends from the side of the body to this elongated toe. In the bat, four toes are elongated, and the wing membrane extends between these toes as well as between the toes and the side of the body. In the bird there are but three toes, and these are so fused together that the bones from the shoulder to the digits form practically a single, jointed rod; narrow folds of skin extend from the limb to the side of the body, but the wing is chiefly made up of the long feathers with which the limb is clothed. A series of pigeons is exhibited to show the positions of the wings at particular phases in the action of flight. Attention may be directed to the models of flying insects.

A few animals are also shown whose ancestors were flying organisms, but which have lost the power of flight owing to

their having been modified in other directions. The penguin for example, uses its wings as paddles under water ; the rhea depends upon its running powers for safety; whilst the extinct dodo and solitaire lived upon islands where they were safe from the attacks of large predatory animals and had therefore no need of wings.

IV. ANIMAL DEFENCES.

[Cases 33 to 44.]

This section occupies one bay (immediately following the Animal Locomotion section) on the west side of the Hall.

Every animal must be prepared to resist or evade the attacks of enemies, and the very diverse means of defence employed are here classified as follows :—(1) Defensive Structures, (2) Protective Forms and Colours, (3) Defensive Habits.

Defensive Structures. These may be of a passive kind, *e.g.*, shells of molluscs, exoskeletons of crustaceans, and the bony armour-like plates of armadillos. Passive structures may sometimes be used offensively, however, *e.g.*, the quills of the porcupine and the spines of the hedgehog. Structures which defend by aggression are antlers of deer, horns of antelopes, and stink-gland of the skunk.

In addition to these bodily structures there are others which are built by the animals, such as the tube of *Sabella* and case of the caddis-" worm " (an aquatic larva of an insect). Structures which are concerned with protection against agencies other than enemies (*e.g.*, weather) are not dealt with here, although in many cases such structures (feathers, hairs) serve to protect their possessors from blows and bites as well as from rain and cold.

Examples of defensive structures are so numerous that only the most interesting of them can be illustrated in the cases. The series begins with the lowest group or Phylum (Protozoa). Perhaps the most interesting specimens are the shells of molluscs, " shells " of tortoises and turtles, armour-like plates of pangolins and armadillos, quills of porcupine, and horns and antlers of various ungulates.

Protective Forms and Colours. This series is divided into three parts :—

(1) *Protective Resemblance.* Under this heading are placed examples of animals whose colours are of such a kind as to conceal them from the eyes of enemies, *e.g.*, snow-animals and open-sea animals. Certain animals are dark-coloured in summer and white in winter (willow-grouse, mountain-hare, stoat) ; and others can even change their colour to suit the general colour of their surroundings (chamæleon, tree-frog). The colours and markings of many species (*e.g.*, leaf-butterfly) resemble in detail some inanimate object.

(2) *Warning Colours.* Certain animals are very conspicuously coloured, and it is usually the case that they possess some effective weapon (sting of wasp) or noxious quality (unpalatable caterpillars). An animal which has been startled or annoyed by such a " warningly-coloured " species will be less likely to interfere with it or its fellows again. Warning colours have a function precisely opposite to that of concealing colours.

(3) *Mimicry.* A defenceless animal (conveniently called a " mimic ") may have a superficial resemblance to a powerful or well-protected one (called a " model ") and be protected to some extent because of the resemblance. This is exemplified by a fly which resembles a wasp.

Defensive Habits. The following are the most important of those habits which are especially concerned with the defence of animals against foes :—

(1) *Retreating.* An animal may simply escape attack by moving from the point of danger, but retreat of a more effective kind is accomplished by swift running (hare), jumping (wallaby), climbing (squirrel), parachuting (" flying " phalanger), flying (bird, bat), or swimming (rat).

(2) *Hiding*, generally the resource of the weaker kinds, may be effected by simply crouching amongst underwood or under stones, etc.

(3) *Feeding at favourable times and in favourable places, e.g.*, by night rather than by day (galago), and in trees rather than on the ground (monkey).

(4) *Rolling up* is resorted to by some animals, usually those with armour-like scales and plates (woodlouse, pangolin, armadillo).

(5) *Death-feigning* to avoid continued attacks or to avoid a fatal bite or blow (stick-insect, opossum).

(6) *Disguising* the body with foreign materials, usually taken from immediate surroundings, is a device used by some animals (sea-urchin, spider-crab) to escape the observation of foes.

(7) *Burrowing.* Many animals make burrows into which they can retreat and bring up their young (rabbit, mole).

(8) *Nest-making* as a means of protection for both adults and young, occurs in many kinds of animals, usually but not exclusively in the higher types (birds and mammals).

(9) *Social habits.* Some animals form societies for common defence and assistance (bee, beaver).

V. EVOLUTION OF ANIMALS.

The collections in this section at present occupy the large cases numbered 75 to 90 and also several neighbouring cases against the east wall of the Hall. The visitor should remember, when studying the exhibits of the "Evolution of Animals" section, that a clear distinction may be made between *evolution* and *theories about evolution.* Evolution is an established fact; it is the precise mode in which evolution has been brought about which is at present a matter for discussion. The collections of the section are therefore divided into two series, viz., (1) The Proofs of Evolution, (2) Evolution Theories.

Proofs of Evolution. This series may be divided into two parts, (A) and (B). (A) This part is called the **General Proofs of Evolution,** and is contained in the first of the wall-cases. It deals with the proofs supplied by the study of the anatomy, embryology, geographical distribution, and general geological history of animals. At the time of preparation of the "Guide" this part of the series, although it is useful and instructive, is not adequately provided with specimens or finally arranged. (B) In this part, entitled **Concrete Cases of Evolution,** there are two fully illustrated examples, those of the Elephant (cases 75 to 82) and the Horse (cases 83 to 86).

Recent discoveries of fossils have made our knowledge of the evolution of these two animals very full, and have shewn that, highly specialised as are the modern elephants and horses, they are the descendants of earlier and more ordinary mammals. Modern elephants are characterised by their large size, great trunks, and the two huge incisor teeth (" tusks ") in the upper jaw ; but in the earliest known stage in the evolution of the elephants (a stage represented by *Mœritherium*, discovered in Middle Eocene strata in Egypt, and of about the size of a tapir) there was no trunk (though probably very mobile nose and upper lips), and the two incisors in each jaw, though large, were not " tusks." Stages intermediate between the elephant and *Mœritherium* are represented by the extinct animals known as *Mastodon*, *Tetrabelodon*, and *Palœomastodon*. The visitor will remark the gradual transition from the comparatively small horizontally-elongated skull of *Mœritherium* to the large vertically-elongated skull of the elephant. On the wall of the case are a series of models to shew the probable appearance in life of the heads of the ancestral elephants.

Under the name " Horse " are included the wild and domesticated horses, asses, and zebras. A horse differs from all other living mammals because it has only one very large toe (with splint-like vestiges of two others) on each foot. Its hoofs, which are large toe-nails, are strong but elastic supports of this swiftly-running animal ; and its cheek-teeth are high, square columns of complex structure, which grow up from the jaw as fast as they are worn away by use at their crowns. It has been shewn by study of fossils that the modern horse has been derived from an ancestor of small size (perhaps about the size of a hare) with simple teeth and five toes on each foot. Specimens, casts, and models of parts (skulls, feet, teeth) of animals which represent various stages in the evolution of the horse are exhibited.

Evolution Theories. In this series will be treated such subjects as Natural Selection and Sexual Selection (" Darwinism "), and Mendelism. It is not yet completed nor arranged, except in the part dealing with sexual selection. The

specimens illustrating the latter subject are contained in cases 87 to 90. The Primary and Secondary Sexual Differences in animals are first dealt with ; and then there are series of specimens to illustrate marked secondary sexual differences in various animals, beginning with the Crustacea. Animals noteworthy on account of the striking ornaments and colours of the males, and the drab plumages of the females, are the Golden and Lady Amherst's pheasants and the king bird-of-paradise. A label gives a very short account of Darwin's Theory of Sexual Selection. The part dealing with Natural Selection and Mendelism will be contained in the neighbouring wall-cases.

VI. BIRD COLLECTION.

Portions of this collection, which is a fairly extensive one, are contained in several cases in different parts of the Hall. The space available for the exhibition of the birds is inadequate, and only a portion of the collection can be shewn at once. The exhibits will therefore be changed periodically, and it will be understood that only a portion of the birds mentioned below can be seen at one time.

Excluding the extinct Archæopteryx, which forms a subclass of the class of birds, birds may be divided into two great groups, the Ratitæ and the Carinatæ. The Ratitæ, which are unfortunately not well represented in the collections, include such forms as the ostrich, rhea, emu, and apteryx, which are all distinguished by the vestigial character of their wings. The Carinatæ are divided into the following Orders :—

Galliformes. This order, of which there are nearly 400 different species, comprises the greater number of the birds which are popularly called game-birds. Many of these are of great beauty, as for example the males of the pea-fowl, golden pheasant, Lady Amherst's pheasant, common pheasant, and the monal. The common fowl is a domesticated Indian red jungle-fowl.

Pterocletiformes. The sand-grouse, of which there are about sixteen species, are intermediate in their affinities between the Galliformes and the Columbiformes. Pallas' sand-grouse, whose home is in the Khirgiz Steppes and Central Asia, is re-

markable because of its occasional migration in great numbers to western Europe and even the British Islands.

Turniciformes. The hemipodes are small birds, somewhat resembling quails, and often considered to belong to the order of Game-birds.

Columbiformes. This group includes the pigeons, and also the dodo and solitaire ; the two latter were relatively large flightless birds, which are now extinct. About 450 different kinds are known ; and many of the exotic species are gorgeously coloured.

Ralliformes, or rails and their allies. The members of this group, of which the common rail, water-hen, and coot are examples, are all adapted for a life among thick undergrowth, or long grass along the borders of rivers or marshes.

Podicipediformes, or grebes. These birds are thoroughly aquatic and are cosmopolitan, although chiefly found in the temperate regions. They are often found in the sea, but breed on convenient patches of reed in fresh-waters.

Colymbiformes, or divers. These closely resemble the grebes, The great northern diver is a beautiful and well-known example.

Spheniſciformes. The penguins, which are sea and land birds, are the most highly specialised of all swimming birds. Their wings form swimming organs, and the feet, which are used for steering, are placed so far back under the body that the birds assume an almost upright attitude upon land.

Procellariiformes, or albatrosses and petrels. These are sea-birds with great powers of flight. They superficially resemble gulls, but it should be observed that they are not related to the true gulls.

Alciformes, or auks, razor-bills, and puffins. Although these birds are able to fly, their wings can also be used to propel them under water. As in many other aquatic birds (e.g., ducks, penguins, and grebes) their feet are placed near the hinder end of the body.

Lariformes. The gulls, terns and skuas are true marine birds, although they frequently venture far inland. They are unable to swim under water like the auks, but their webbed feet enable them to paddle on the surface.

Charadriiformes, or plovers, sandpipers, bustards, etc. These are usually sea-shore or fen-inhabiting birds. The young are quite active when hatched ; the eggs are laid in a slight hollow in the ground, and there is little or no attempt at the formation of a nest.

Gruiformes, or cranes, externally much resemble the herons and storks, but such resemblance is merely superficial. The cranes are long-legged, long-necked birds, found almost all over the world except in South America.

Ardeiformes, or herons, storks, and ibises. The sacred ibis, which was treated with great veneration by the ancient Egyptians, belongs to this group. From white herons, particularly the species called egrets, are obtained the so-called "osprey" plumes, which are part of the nuptial plumage of the birds.

Anseriformes, or ducks, geese, and swans. The majority of the Anseriformes obtain their food in the water, the tiny organisms or vegetable matters being retained in the mouth by means of the lamellæ with which the edges of the bill are provided, whilst the water which has been taken in at the mouth is drained away.

Phœnicopteriformes. The flamingoes, with their peculiarly formed bills and extremely long legs and necks, are well known. The beautiful common flamingo sometimes reaches Britain in the summer.

Pelecaniformes. This order includes the pelicans, darters, cormorants, gannets, and frigate birds. In spite of its ungainly appearance the pelican is an expert flyer as well as a surface-swimmer, and it frequently soars to great altitudes in the air. Pelicans feed upon fish, and a number of these birds will sometimes combine to form a line across a piece of water in order to "drive" the fish to the shallows, where they are caught by the birds.

Serpentariiformes. This order contains the well-known secretary-birds. Their name is derived from the tuft of feathers which hang at the back of the head and resemble quill pens carried behind the ear. The secretary-birds live almost exclusively upon reptiles, of which they destroy large numbers.

Accipitriformes, or birds of prey, such as vultures, hawks, eagles, and ospreys. They possess short, sharp, strong beaks, the upper part of which curves downwards and terminates in a hook-like pointed end. The claws are large, curved, and powerful.

Strigiformes. This order contains the owls. The peculiar arrangement of the feathers upon the face, which gives to owls their characteristic appearance, is very striking. The large eyes are directed obliquely forwards; and the upper eyelid closes the eye, instead of the lower eyelid as in birds generally.

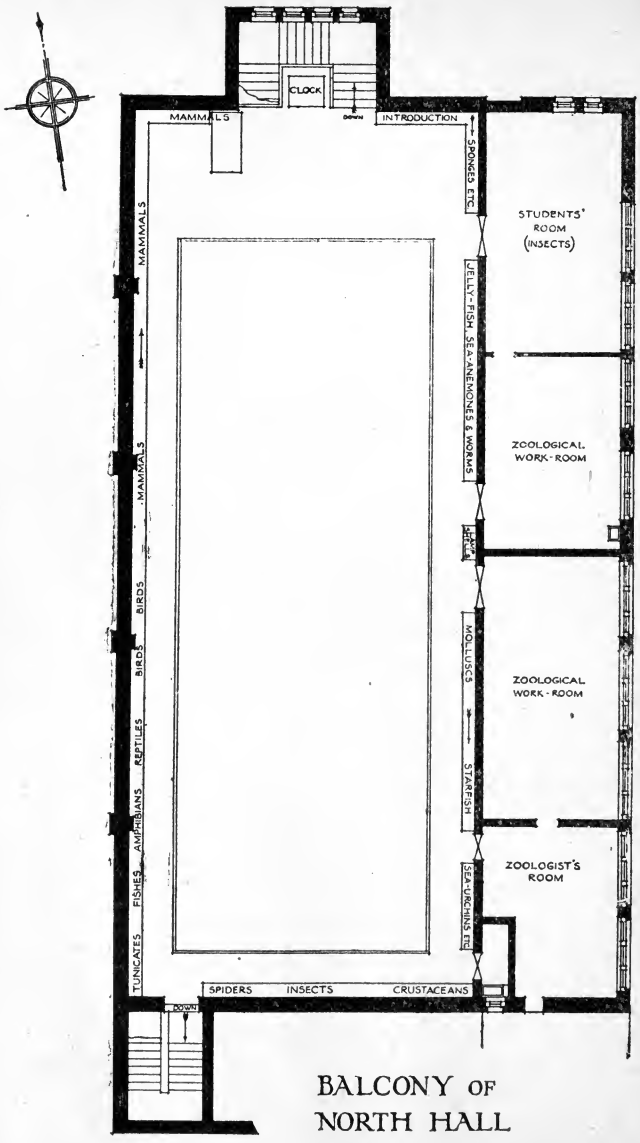
Psittaciformes. There are about 500 species of parrots. They are very intelligent birds, and are on that account sometimes placed at the head of the birds, but their true position is uncertain. The upper half of the beak is movably articulated to the skull, whereas it is immovably fixed in other birds. Parrots are especially remarkable for the facility with which, in a state of domestication, they recollect and repeat phrases of human speech.

Coraciiformes. This order contains the oil-birds, frog-mouths, bee-eaters, rollers, kingfishers, hornbills, humming birds, swifts, and other less well-known forms. The hornbills have a superficial resemblance to toucans.

Trogoniformes. These are smallish birds known as trogons, remarkable for their brilliant colouration and soft plumage. They are very numerous in Central and South America but are also found in other parts of the world, such as Africa and the Oriental region.

Cuculiformes. The cuckoos are especially interesting on account of the habit possessed by many of the species of placing one or more eggs in the nest of some other bird, whose own young are subsequently ejected from the nest by the young cuckoo.

Piciformes, or toucans, woodpeckers, and jacamars. The toucans are easily recognisable owing to the extraordinary shape and size of the bill; they are confined to tropical America, and should not be confounded with the Old World hornbills.


CLOCK
DOWN
MAMMALS
INTRODUCTION
SPONGES ETC.
STUDENTS' ROOM (INSECTS)
JELLY-FISH, SEA-ANEMONES & WORMS
ZOOLOGICAL WORK-ROOM
MAMMALS
MAMMALS
BIRDS
BIRDS
REPTILES
AMPHIBIANS
FISHES
TUNICATES
MOLLUSCS
STARFISH
ZOOLOGICAL WORK-ROOM
SEA-URCHINS ETC.
ZOOLOGIST'S ROOM
SPIDERS
INSECTS
CRUSTACEANS
DOWN
BALCONY OF NORTH HALL
FEET 10 5 0 10 20 30 40 FEET

Passeriformes, or perching birds. This order of smallish birds comprises such familiar forms as swallows, flycatchers, wrens, dippers, thrushes, tits, wagtails, pipits, larks, finches, starlings, paradise birds, and crows. There are between five and six thousand species. Their feet are adapted for perching, three of the toes being directed forwards and one backwards.

NORTH BALCONY.

VII. SURVEY OF THE ANIMAL KINGDOM.

This section occupies the whole of the wall cases on the balcony of the North Hall. It is designed, not to exhibit as many species as possible of each group, but to afford a succinct view of the most important characters of the chief groups of animals, from the classificatory standpoint. It is hoped that this section will serve as a basis for study of the other collections in the Zoological Department. The Survey begins with specimens to illustrate the principles of classification, and the meaning of *homology* and *analogy*, etc. The main groups of animals are then taken one by one, beginning with the lowest (the Protozoa) and the chief facts in regard to their structure, life-histories, and habits illustrated.

The following are the main groups of the Animal Kingdom —each of these groups being called a *phylum* :—

Protozoa, or the simplest animals. These are mostly of such minute size—the microscope being necessary in order to see them properly—that it is not practicable to show many actual specimens. They are, however, illustrated as far as possible by enlarged models and drawings, and in many cases a glass slip with the protozoans themselves (or their shells) accompanies the model, in order to give an idea of the small size of these organisms.

Porifera, or sponges. The chief types of sponges are shewn, and their structure illustrated. It should be understood that what is commonly called a sponge (the bath-sponge, for example) is really only the skeleton of the sponge, the soft parts having been artificially removed. The specimens in fluid give the best idea of what a sponge is like in life, the other specimens being dried, or partially or wholly skeletonised, sponges.

Attention may be drawn to the beautiful sponge-skeleton known as "Venus's Flower-basket."

Cœlenterata. This phylum includes the jelly-fishes, sea-anemones, and corals. A series of corals, and models illustrating the structure of coral reefs and a coral atoll, are the chief exhibits. It should be noted that the dry hard coral is merely the dead skeleton of the colonies of coral animals.

Coral animals are still occasionally, but quite incorrectly, called insects; their organisation is wholly different from that of an insect. The animals (or *polyps* as they are called), each with its circle of tentacles, may be examined in the specimen of the red or precious coral (*Corallium rubrum*).

Worms. Five perfectly distinct phyla of animals, which may, however, be conveniently grouped together as "worms," follow the Cœlenterata. Here are shown examples of marine annelids (such as the common lug-worm, the tube-building *Sabella*, and the bizarre *Chætopterus*), and various parasitic worms. Among the latter may be mentioned one of the tape-worms, which, in the mature stage, lives in the human intestine and may reach a length of five or six yards.

Brachiopoda, or lamp-shells. These animals have received their name of lamp-shells because of the form of the two-valved shell of many of the well-known species, which in side view resembles an ancient Roman lamp. The brachiopods must not be confounded with the molluscs, to which they bear a superficial resemblance.

Polyzoa. These are small, mostly marine, animals, commonly called moss-animals. A familiar species is the sea-mat or horn-wrack, whose dried remains are so often found on the beach. The structure of the polyzoans and the brachiopods is illustrated in the cases.

Mollusca. This phylum includes the snails and slugs, oysters and cockles, and squids and cuttle-fishes. In examining the shells of molluscs, it should be remembered that the shells are only a part of the mollusc, and the study of shells alone cannot give the student a proper idea of the group. As far as possible the molluscs themselves as well as their shells are shown or illustrated here. Two specimens of the paper nautilus or argonaut are shown. The beautiful

shell is only found in the female and is retained in position by the large flattened pair of tentacles. It was formerly stated that the argonaut used its shell in the manner of a boat to sail in, the flattened tentacles being raised aloft to catch the breeze, but this is mere fiction. The sucking cups upon the tentacles of the octopus, squid, and argonaut should be noticed. By means of these cups, prey, which has been seized by the tentacles, is held fast.

Echinodermata, or star-fishes, sea-urchins, sea-cucumbers, and their allies. In addition to specimens and diagrams of adult echinoderms, the life-histories of these animals are illustrated by a series of greatly enlarged wax models of the larval forms through which most echinoderms pass to reach the adult stage. These larvæ are totally unlike the adults and have very curious shapes.

Arthropoda. The arthropods, or jointed-limbed animals, include the Crustacea (or lobsters and crabs), the Arachnida (or scorpions and spiders), the Myriapoda (or millipedes and centipedes) and the Insecta (or insects), together with some obscure and little-known groups. Especially interesting in this series are the preparations to illustrate the life-histories of well-known insects, among which may be mentioned the cockroach, mole-cricket, water-boatman, dragon-fly, caddis-fly, cabbage butterfly, puss-moth, common water-beetle (*Dytiscus*), red ant, and humble-bee. Large models of the common house-fly, and of the head and mouth-parts of other insects, are also shown.

Chordata. This large and important phylum occupies the whole of the wall cases on the west side of the balcony, *i.e.*, cases 40 to 77. It comprises the four groups of Hemichordata, Tunicata, Cephalochordata, and Vertebrata. The first of these groups includes, amongst other obscure forms, the curious marine animal known as *Balanoglossus*; the second the sea-squirts or tunicates; and the third the well-known *Amphioxus*. The fourth, or Vertebrate group, is more fully dealt with than any of the others in this section, and it includes the following classes :—

(1.) **Cyclostomata.** This class includes the lampreys, and hag-fishes. These eel-shaped, limbless animals are distin-

guished from other vertebrates by the absence of true jaws, the mouth being adapted for sucking. A tongue-like organ, lying in the mouth, and provided with horny teeth, is used in rasping off the flesh of prey.

(2.) **Fishes.** Representatives of the more important groups of fishes, and specimens to illustrate the chief points in their structure, are exhibited. An interesting modification of the dorsal fin is found in the sucking-fish, in which this fin forms an adhesive disc upon the upper surface of the head. By means of the disc the sucking-fish is able to fasten itself to the body of a shark, a turtle, or even to a ship, and is thus enabled to traverse greater distances in search of food than it would be able to cover by its own more limited powers of swimming. Attention may also be drawn to the larva of the common eel. When eels are five or six years old they migrate to the deep sea to breed and do not return to the rivers. The larva is colourless and quite transparent, and is not at all like the adult eel. As it develops and begins to assume the adult shape it approaches land and, as the "elver," ascends a river. Before the development of the eel was known the larva was regarded as a distinct fish, and given the name of *Leptocephalus*.

(3.) **Amphibia.** This class includes the newts, salamanders, frogs, and toads. The most noteworthy exhibit is the series of wax models of different stages in the development of the frog. Each model is sixteen times natural size.

(4.) **Reptilia,** or alligators and crocodiles, turtles and tortoises, and snakes and lizards. A large tortoise is so prepared as to show the exterior of the animal on one side only, the skeleton appearing on the other. This instructive "double preparation," as it may be called, will repay careful examination. A skeleton of a small alligator shows the arrangement of the bony scutes upon the back of the animal.

(5.) **Birds.** Specimens are arranged to illustrate the modifications of the skeleton in birds, as well as the arrangement of the feathers upon the body and wings. A series of preparations and a large model illustrate the structure of feathers, and specimens of different kinds of feathers are also shown. The more important types of feet and beaks of birds

will be exhibited. Attention may be directed to the models and specimens illustrating the development of the fowl.

(6.) **Mammalia.** A skeleton of a dog is arranged upon a board and so labelled that the name of each bone can be seen at a glance. As the bones of other mammals are essentially the same as those of the dog, varying merely in details, this skeleton will be of assistance to those who may wish to follow out the bones in the other mammalian skeletons shown in this series. The dog's skeleton is followed by a series of specimens to illustrate the structure of the mammalian body. The several orders of Mammals, beginning with the lowest (the Monotremata, or egg-laying mammals), are then taken in order, stuffed specimens of important or typical forms shown, and the more instructive details of their structure illustrated by means of skeletons, teeth, and limbs. Attention may be called to the " double preparations " of the armadillo, porpoise, rabbit, hedgehog, mole, and bat. The mammals end in this section with the monkeys ; the higher apes and man are treated in the section of Physical Anthropology (see page 92).

STUDENTS' ROOM.

VIII. STUDENTS' REFERENCE COLLECTIONS.

The reference collections, which are housed in a special room on the balcony, are provided for the use of students only. The collections may be consulted by those wishing to identify specimens, or who may be studying the subjects of which the collections treat, at any time when the Museum is open. Applications for admission should be made to one of the Museum attendants, and all visitors to the Students' Room are required to sign the book kept there for this purpose. It is particularly requested that the drawers of the cabinets should be opened and closed gently.

The collections at present consist of **British butterflies and moths** arranged in two cabinets ; a cabinet of **British beetles;** a cabinet of **British land and freshwater-shells ;** and a cabinet of **British birds' eggs.** In addition there are large collections of exotic shells, butterflies, moths, and beetles.

On descending the stairs behind the mechanical clock and turning to the left at the bottom, the visitor will reach the corridor which contains the living animals.

NORTH CORRIDOR.

IX. LIVING ANIMALS.

The living animals maintained in the Museum are mainly British reptiles and amphibians, and animals commonly found in the freshwaters and around the coasts of the British Islands; but certain foreign kinds (*e.g.*, salamanders, chamæleons) are often exhibited. The freshwater organisms are obtained in the neighbourhood of the Museum, and most of the marine forms at the near sea-coasts; inspection of the contents of the tanks will give a good idea of the kinds of creatures which may easily be obtained and kept in captivity.

In the glass frames above the aquaria and vivaria there are specimens or pictures of the particular kinds of animals living in them, so that the visitor can easily identify the animals. The interior of a tank may be illuminated with electric light by pressing and holding down the white button which lies to the right hand.

The aquaria and vivaria are stocked as fully as possible with animals, but as the population is necessarily a shifting one (some animals being abundant or accessible only at certain seasons, or only to be kept alive for short periods), the exhibition is constantly changing. By visiting the corridor at various seasons of the year, however, many different kinds of animals may be seen.

It may be pointed out that the contents of the tanks cannot be seen in a cursory glance. Many of the animals are adepts at concealment, or their forms and colours harmonize with the surrounding rocks and seaweeds, and a tank which at first sight appears to be empty may be found on closer examination to contain many interesting inhabitants. A good plan is to fix upon some animal (or group of animals) and watch its motions and behaviour, returning to observe it, if possible, at

intervals, and referring to the appropriate Handbook for information about it.

The Marine Aquaria occupy nearly the whole of one side of the corridor, and are filled with sea-water. The following are the kinds of animals which the visitor may expect to see alive at some time during the year :—

Porifera.—Bread-crumb sponge.

Cœlenterata.—Common sea-anemone, plumose sea-anemone, daisy sea-anemone, opelet sea-anemone, *Sertularia*, "dead men's fingers."

Worms.—"Sea-mouse," and tube-worms (*Sabella*, *Serpula*).

Mollusca.—Periwinkle, dog-periwinkle, whelk, dog-whelk, limpet, edible mussel, edible cockle, oyster, saddle-oyster, scallop.

Echinodermata.—Common starfish, sun-star, cushion-star, brittle-star, purple-tipped sea-urchin.

Arthropoda.—Shrimp, prawn, lobster, hermit-crab (frequently with commensal sea-anemone), shore-crab, edible crab, spider-crab.

Chordata.—Sea-squirts (solitary and in colonies), and common fishes, such as blenny, goby, bullhead, butterfish, rockling, wrasse, pipe-fish, plaice.

In addition to these common kinds of marine animals, various other species are frequently on exhibition.

The animals are more fully described in the Handbook to the Marine Aquaria, but a few details may be given here of the commoner sorts which will be seen in the tanks. The common sea-anemone is always plentifully represented, and, it may be pointed out, makes an excellent inmate of an aquarium, as it not only thrives well but is a very pretty species and one easy to obtain. It grasps its food (living small animals) with its numerous tentacles, and benumbs the victim with the minute stinging-threads which it shoots out of them. Anemones are true animals, and not plants, as they are sometimes popularly supposed to be. The plumose sea-anemone, which is the most beautiful of all our British anemones, usually only expands fully in darkness. The parasitic anemone, which is found situated upon the mollusc shell

inhabited by a hermit-crab, is an interesting species. It obtains a share of the food which is scattered about when the hermit-crab is making a meal, and the hermit-crab on its part receives protection from predatory fishes, which are deterred from making a meal off the crab by the presence of the dreaded sea-anemone with its stinging cells. This curious partnership is termed *commensalism*. The star-fish should be watched and its curious mode of walking by means of numerous tube-feet noted. Many marine worms build protective tubes around themselves, *e.g.*, *Serpula*, *Sabella*, and *Terebella*. The lobster, like other crustaceans (crabs, shrimps, etc.), casts its hard "skin" at intervals, and grows rapidly while the new skin is soft and extensible.

The Freshwater Aquaria and Vivaria occupy the opposite side of the corridor. The following animals are usually to be seen at some time or other during the course of the year :—

Cœlenterata.—Hydra.

Mollusca.—Pond-snails (*Limnæa*, *Planorbis*), pond-mussel, freshwater limpet.

Arthropoda.—Crayfish, water-boatmen (*Notonecta*, *Corixa*), water-scorpion, water-beetles (*Dytiscus*, *Hydrophilus*); larvæ of gnat, dragon-fly, water-beetle, etc.

Chordata.—Stickleback, perch, gudgeon, carp, minnow, roach, and other common fishes, newt, axolotl, salamander, frog, toad, natterjack, slow-worm, green lizard, grass-snake.

In addition to these species, other kinds of animals are from time to time exhibited. In their appropriate seasons there are also shown the larvæ of various butterflies and moths; and all stages in the development of the frog, from the eggs ("spawn") to the perfect frog.

From May to October a six-frame **observation bee-hive** is placed upon exhibition, and the bees can be watched through the glass sides of the hive as they carry on their work. The bees are able to leave the hive by means of an opening in the wall of the corridor, a glass-covered tunnel connecting this opening with the hive. If this tunnel be watched, the bees

will be seen entering and leaving the hive in numbers, many of those which have returned from the gardens carrying a mass of pollen upon each hind leg. In order to facilitate study of the bee, a **model of a worker bee** (worker bees are sterile females, and do the work of the hive), enlarged to 45 times actual size, has been placed near the hive. One side of the model shows the external parts of the bee, the other its internal organs. The economy of the hive, as well as the modes of life of the animals mentioned above, are described in the Handbook to the Vivaria and Freshwater Aquaria.

THE LIBRARY.

The Library is a students' reference library of standard and other works in natural science, selected, in the main, for their relevancy to the studies represented by the exhibits in the Museum. In several directions, however, the Library goes considerably beyond the scope of the Museum.

It is classified as follows :—

Anthropology (*the Study of Man*).

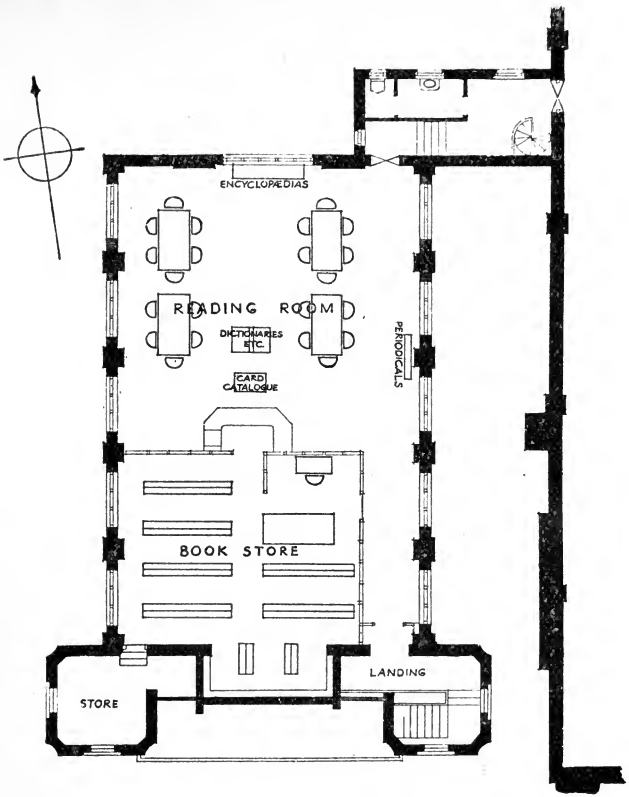
Systematic treatises—Introductory or popular works—The history and bibliography of Anthropology—The publications of societies and museums—Periodical publications — Physical Anthropology — Human origins—Anthropogeography — Ethnography (the detailed description of particular races or ethnic groups of mankind)—Archæology (the study of the relics of primitive races no longer extant, and of the remains of extinct civilizations)—Ethnology (culture in general, and researches, both special and comparative, into the origin, development and character of languages, arts, crafts, industries, religions and social institutions, together with Folklore, or the study of the vestiges of primitive culture surviving in advanced civilizations).

Botany.

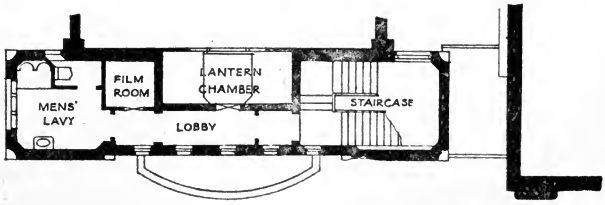
Systematic treatises dealing with the study of wild plants—Introductory or popular works—The history of Botany—The publications of societies and museums—Periodical publications—Palæophytology (the study of fossil plants)—Phytogeography (the geographical distribution of wild plants, and including local floras)—Plant morphology, physiology, embryology, and bionomics—Illustrated monographs of particular groups.

General and Philosophical Biology.

Biological science, so far as it deals with the fundamental nature and activities of living things, or otherwise applies equally to plants and animals, including the physical and chemical properties of living substance,



LIBRARY



MEZZANINE PLAN

cytology, general histology, morphology, physiology, embryology, heredity, variation, sex, bionomics (ecology) and the factors of organic evolution generally, the history of biological theory and discovery, and the philosophy of Biology.

Geography.

Systematic treatises—The publications of societies—Voyages of discovery—The travels of naturalists and others—Topography—Maps.

Geology and Physiography.

Systematic treatises, and special works on geomorphology, oceanography, rocks, earthquakes, glaciers, volcanoes, and the scientific study of scenery.

Meteorology and Climatology.

Physics, Chemistry and Mineralogy.

Science in General.

Encyclopædias, dictionaries, bibliographies, the biographies of men of science generally, the publications of societies and museums, periodical publications which deal with both physical and biological science, and special works on microscopy, nature-study, museums and libraries.

Zoology.

Systematic treatises dealing with the study of wild animals—Introductory or popular works—The publications of societies and museums—Palæozoology (the study of fossil animals)—Zoogeography (the geographical distribution of wild animals, including works on local faunas)—The protection of wild animals—Animal morphology, physiology, embryology, and bionomics—Illustrated monographs of particular groups.

The above indicates the scope of the Library in its main outlines. For details, the card subject-catalogue of the Library should be consulted, or *A Handbook to the Library* (1905) with *Supplement* (1912).

Library Regulations.

Encyclopædias, dictionaries, bibliographies, and similar books of reference, together with the current issues of periodical publications (including societies' journals or transactions), are on open shelves, to which free access is permitted. For other books, and for the back numbers of periodicals, written application must be made on the form provided for the purpose.

No book or other publication, the property of the Council, may be taken from the Reading Room. Books or periodicals taken from open shelves are to be replaced after use, and the person to whom any book or other publication has been issued is required to return it when no longer required to the Librarian or other official in charge of the Library for the time being.

REGULATIONS FOR VISITORS TO THE MUSEUM AND LIBRARY.

1. Visitors are not permitted to touch any of the objects exposed in the Museum.

2. Visitors must quit the Museum and Library at the hour fixed for closing, and may not enter any portion of the premises set apart for private use.

3. Visitors are not permitted to take umbrellas, parasols, or sticks into the Museum and Library, except by permission in cases of infirmity. Sticks, umbrellas, parasols and parcels will be taken care of free of charge, and must be left with the attendant at the entrance.

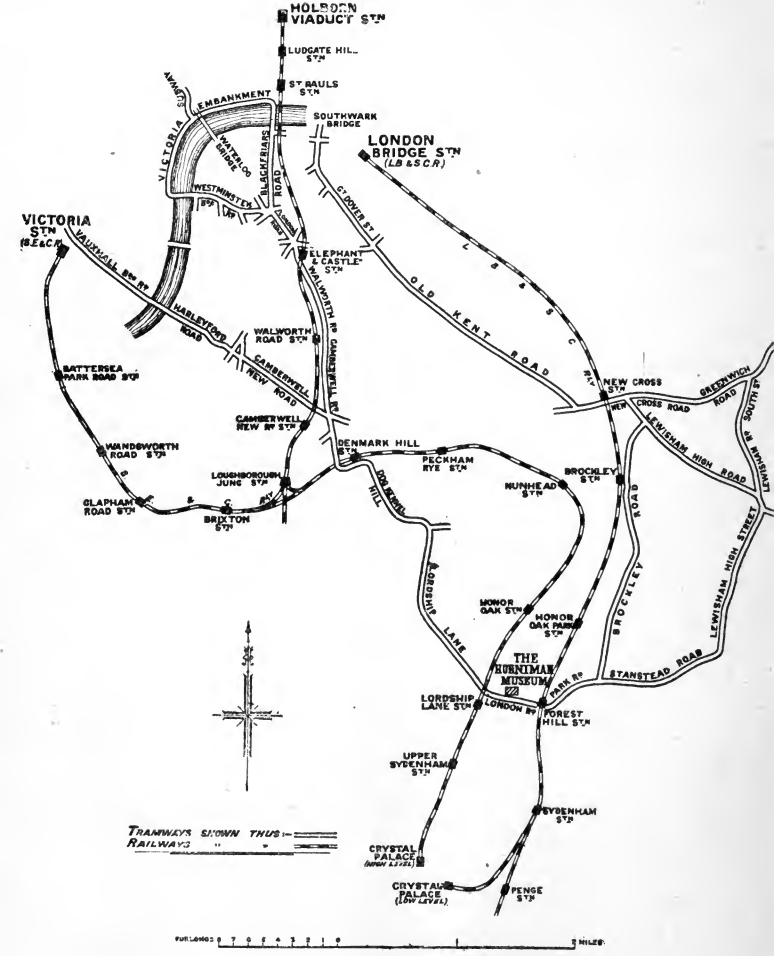
4. Visitors are not permitted to bring provisions into the building or to take meals therein.

5. The deposit of waste paper or other refuse in the building is not allowed.

6. No smoking is allowed in the building, and persons using the same must preserve quiet.

7. Any persons using improper language, or behaving in an indecorous manner, or otherwise misconducting themselves, will be removed by the attendants.

8. Children under the age of twelve are not allowed in the Museum or Library unless accompanied by some responsible person in charge of them.



(Tram and train routes, see also page 2 of cover.)

List of Publications dealing with the Collections in the Horniman Museum and Library.

PRICE ONE PENNY EACH.

2. A Handbook to the Collection arranged as an Introduction to the Study of Animal Life. (Second Edition.) (*Out of print.*)
3. A Handbook to the Vivaria and Fresh Water Aquaria. (Second Edition.) (*Out of print.*)
4. A Handbook to the Marine Aquaria. (Second Edition, with two plates.) Post free, 2½d.
5. A Handbook to the Case arranged as an Introduction to the Study of Birds' Eggs. (With six plates.) (*Out of print.*)
9. A Handbook to the Cases illustrating Stages in the Evolution of the Domestic Arts.
   Part I.—Agriculture, the Preparation of Food, and Fire-making. (With two plates.) Post free, 2½d.
10. Ditto.
   Part II.—Basketry, Pottery, Spinning, and Weaving, etc. (With two plates.) Post free, 2½d.
11. A Handbook to the Cases illustrating Animal Locomotion. (With one plate.) (*Out of print.*)
12. A Handbook to the Collections illustrating a Survey of the Animal Kingdom. (*Out of print.*)

PRICE THREEPENCE.

Post free, 5d.

1. Guide for the use of Visitors to the Horniman Museum and Library. (Third edition, 1921, with plans and a map.)
6. A Handbook to the Library (1905),with Supplement (1912).

Post free 4d.

7. From Stone to Steel: a Handbook to the Cases illustrating the Ages of Stone, Bronze, and Iron. (With two plates.) (*Out of print.*)

PRICE TWOPENCE.

Post free 3½d.

6a. A Supplement to A Handbook to the Library.
8. A Handbook to the Weapons of War and the Chase. (With two plates.)

PRICE SIXPENCE.

Post free 8d.

13. The Ascent of Man: a Handbook to the Cases illustrating the Structure of Man and the Great Apes. (With