PROBLEMS & TRENDS IN
MUSEOLOGY

MINISTRY OF EDUCATION

Guest Editorial

Expanding Role of the Museums In India

P. N. Kirpal

It is my proud privilege to welcome the museum experts from our neighbouring countries assembled in New Delhi for the first time from 30th January, 1966 to 28th February, 1966 to participate in the Seventh Regional Seminar of UNESCO on the 'Development of Museums'. The purpose of the Seminar is to discuss the present stage of the development of museums in the countries of Asia and programmes to be planned in immediate future with a view to preserving elements in the original cultures of the areas and to assimilating new influences. During their visit to various museums and sites of outstanding importance, the participants, will also have a glimpse of a cross section of the rich and varied cultural heritage—a heritage closely linked in the many significant and creative experiences of the past with the great cultures of the countries to which they belong. Most of the participants will no doubt recognize easily the many concrete evidences of our ancient culturalties. I have every hope that the deliberations of the Seminar will help create better understanding of each other and contribute immensely towards the strengthening of our mutual bonds.

The Background

The Museum movement in India, till the advent of the nineteenth century, was largely confined to royal galleries, temple-walls and niches, and the precious collections of a few wealthy connoisseurs of art. In these repositories of curios there was no systematic planning for acquisitions, no arrangement for display on scientific lines,

little scope for research and systematic study of the objects and no mass appeal to the visitors. They were merely private collections open to a very limited class or selected individual visitors and were in no way the public museums in the modern sense of the word. We are thankful to the Asiatic Society not only for their pioneer research work 'into the History.. Antiquities..Arts..Sciences..and Literatures of Asia', but also for the establishment of the first modern Museum in Calcutta in 1814 with the Society's collections in the fields of archaeology, zoology, geology, botany and anthropology. This gave a definite lead to the other towns and before the end of the century—Museums were established in all the major capitals of the sub-continent.

India's independence in 1947 ushered in a new era of state patronage of arts and antiquities. A number of entries in the Union and Concurrent lists of subjects in our Constitution provided for a direct involvement of the Central Government in the sphere of museums and archaeological remains. The Institutions known at the commencement of the Constitution as the Indian Museum, the Imperial War Museum, the Victoria Memorial Museum and the Indian War Memorial and other like institutions financed by the Government of India wholly or in part and declared by Parliament by law as institutions of national importance, were placed under the Union List, which also included the ancient and historical records and archaeological remains declared to be of national importance. Archaeological remains that were not declared to be of national importance were put under the Concurrent List, while museums etc. controlled or financed by the states were included in the State List.

Central Assistance

The Ministry of Education, as a Union agency, has been directly concerned with the reorganisation and development of museums in India in addition to the special Museums of national importance brought under its purview. During the third Plan period a programme limit of Rs. 55 lakhs was fixed for the 'Development of Museums', both government and non-government; in addition, there were specific provisions for the Central Government museums. Museums in India have thus been placed in three categories—including those administered by (a) the Ministry of Education as museums of national importance, (b) the States, and (c) the Universities and private organisations and individuals. In the case of the museums in the first category the entire expenses are met by the Government of India, while in the case of State Governments and private museums, liberal grants are given to them under various schemes.

In the formulation and administration of various schemes for the development of museums the Ministry is guided by the deliberations and recommendations of the Central Advisory Board of Museums and its standing and *ad hoc* committees. There has been a progressive increase of collaboration between the different museums on the one hand and the Central Government and other museum agencies on the other.

Training Facilities

The old boundaries and narrow horizons within which the museums had to function are fast disappearing, giving way to new vistas, opening new possibilities for museums in the spread of education and culture. In the field of University teaching. Indian museology has received world-wide appreciation and recognition. It may be pertinent to mention what Mr. P. S. Rowson, (Keeper, Durham University Museum), a UNESCO expert, has stated in his Report (India, Museology, Paris, 1964): "India too is leading the world in University teaching of Museology students. The post-graduate courses first at Baroda and then at Calcutta have set a notable precedent that so far has been followed only in one University in the U.S.A." Ministry of Education afforded substantial assistance to the trainees enabling them to receive training.

This training has two aspects, *viz.* (i) basic training of personnel in museum techniques for fresh employment in museums and (ii) in-service training of persons already employed for raising the standards of museums. The Baroda and Calcutta Universities provided for the admission of 24 students each year. The scope of in-service training needs to be expanded to meet the various aspects of Museum techniques *viz.*, collection, preservation, presentation, classification, documentation, publication and research. A minimum course of such training should be developed for the proper maintenance of museum objects and all the keepers asked to undertake this course. In the context of the ever expanding role of museums, it is essential to provide adequately for the training of specialized personnel required for organizing museums on modern lines.

A Dynamic Display

Museums should no longer be approached with the set ideas and prejudices that went with the concept of a museum as an *ajaibghar* (a curio palace) or as mere storehouse of the dead. Improvement of museum techniques and utilization of museum materials should now engage the attention and interest of the general public as well as the specialist and the scholars. An artistic and tasteful arrangement of exhibits with a proper combination of designing, display and lighting in a modern museum, provides a pleasing atmosphere even for an irritable visitor and in the midst of attractive surrounding he can recognise the museum as a palace of muses—a peaceful diversion providing for a communion with a significant exhibit, even a source of abundant aesthetic joy born of impact with beauty. Such an aesthetic sense of display comes after years of training, experience and devoted work. Our young curators will have to cultivate new skills and tastes, so that their galleries are transformed into a source of energy, incentive, stimulation and admiration to the visitors that chance to enter them. I have advisedly used the words 'chanced to enter' the museums. It is my regret that most museums never try to be more than *ajaibghars* and visitors enter them by chance only. It is time that the heads of museums make a determined effort to break this stagnation and take vigorous steps to attract visitors to the museums.

To start with, museums should in consultation with the local schools arrange small special displays on particular topics closely linked with the subjects taught in schools, so that children can come to the museum and consolidate their theoretical knowledge by visual study also. Perhaps, in a few select cases they may even be allowed to handle the exhibits under proper supervision. If such exhibitions are held at least once a fortnight or a month it would inculcate in children an appreciation of art and the habit of visiting museums. Such exhibitions cannot involve much outlay of money and even small museums with limited personnel should be able to organize special exhibitions.

Publications and Research

Museum publications can broadly be classified into following categories: Handbooks or guides, scholarly catalogues with illustrations and research monographs and books. It is a matter of concern that the standing committee of the Central Advisory Board of Museums noted with regret that museum publications brought out with the Central assistance during the second Plan period were found to be sub-standard both in contents and get-up and the committee had to lay down stringent condition of prior approval of the manuscript during the third Plan period. This and other definite attempts made in this regard have led to some improvement in the situation but I think a great deal has yet to be accomplished before our museum publications can be compared with those published abroad. The standing committee may examine the setting-up of a permanent machinery at the Centre to devote its whole-time attention to this urgent work. However, the achievements of some better equipped museums (National, Prince of Wales, Madras Government and Asutosh to quote a few) will have to be recognized and we may expect others to follow their lead. Our variegated museum collections, when presented by scholars, through richly illustrated and sumptuously produced catalogues, would attract the attention of the world connoisseurs of art. These catalogues are bound to raise the standard of research and would lay firm foundations for deep academic investigations into various aspects of the cultural wealth of India.

Museum Buildings and Equipment

There was a suggestion that the Government should take more concrete steps to curb the general tendency on the part of autonomous, semi-autonomous or departmental bodies to spend extravagantly on buildings. Museum buildings cannot be equated with office buildings in this regard and while accepting general need for austerity and avoidance of waste, our view was that Museums were not built every day and they were naturally prestige buildings to be visited by people for long time to come. However, due to paucity of funds we could not encourage major building activities for last few years and only small grants could be given for minor extensions and special repairs. I regret that this position is likely to continue for a longer period. In the case of essential equipment, however, we have been quite liberal and Central assistance on cent per

cent basis was extended to all museums for certain types of equipment considered essential for each museum. Some difficulty was experienced in the availability of foreign exchange for importing certain types of equipment not manufactured locally. An *ad hoc* committee of the C.A.B. of Museums was constituted to consider the list of materials and equipment and also to suggest measures to step up indigenous production. But indications are that for the present foreign exchange may not be available.

Extension Services and Travelling Exhibitions

To my mind, science and technological museums could play a vital role in projecting to the common man the progress the country has made in the field. This Seminar will no doubt discuss the possibilities of developing such museums in the region. Museums in many advanced countries take some of their exhibits through a travelling museum service to a great many people in small towns and villages who are unable to travel to the cities to see much of this vast store of culture. The idea is that if some of the people cannot get to the museum then something of the museums should be sent out to the people. I am glad to learn that some of our museums have started experimenting in this field and the Birla Industrial and Technological Museum, Culcutta have organized touring shows in rural areas. I am sure this example will be followed by other museums and our rich collections will thus be taken to the community. While the rural people will have an opportunity of having a glimpse of our ancient and rich cultural heritage, the organisers will also know at first hand the tastes and attitudes of the people and have an insight into their problems. The plaster cast kits prepared by the National Museum could be used with advantage by the State Governments for the purpose, but I would like to suggest that some original exhibits should also accompany such touring exhibitions. Our Museums should become great centres of academic exchanges, lectures, literary and cultural meets. Renowned scholars and scientists should be occasionally invited to deliver illustrated talks and local literary associations and the members of public invited to participate in these functions. Some of our museums already provide excellent extension services to the community and these have to be improved and introduced in other museums.

Library and Laboratory Facilities

As far as possible each Museum should be equipped with a good library and a laboratory and if that was not feasible these facilities should be made available to all the museums on a regional basis and a selected regional museum should cater to the needs of all the museums in the region. All the museums should in particular be furnished with books on museum techniques. A select bibliography of about 100 such books was prepared and grants were offered to State Museums to acquire books which were not already available with them. These books were made available to all the State Museums.

The Central Laboratory of the National Museum extended generous help to sister

museums in the preservation of their objects, which again is a welcome development and, I am sure, other regional museums will extend this assistance to the museums in their respective regions. I am glad to learn that the Central Laboratory of the National Museum is being developed as a Laboratory for South-East Asia as envisaged by Unesco.

Museum Camps

With the organisation of the first Museum Camp on Sculpture in Madras State Museum in 1963, we embarked upon a new venture which has proved to be of immense benefit to our museums and museum specialists. The second camp on paintings was held almost a year later in the Bharat Kala Bhawan Museum, Varanasi and the third on decorative arts (including textiles) in November, 1965 in the Prince of Wales Museum, Bombay. These camps are intended to raise standards of museum staff, especially of those in the service of State museums, by providing them insight into scholarship and by sharing experience in trying to make a contribution and by demonstration and discussion of technical museum practices and skills appropriate to the subject. In a sub-continent of great distances it is quite necessary that curators and Directors of Museums from various parts of the country should occasionally gather together in an informal atmosphere to discuss problems of common interest. I am sure this idea of Museum Camps and Museum Seminars will grow and further strengthen a spirit of camaraderie among our museums.

Amenities for Museum Staff

The scales of pay and other amenities of the museum staff particularly at lower levels has been engaging the attention of the Government of India, the State Governments, the Museums Association of India and the Central Advisory Board of Museums. It is agreed at all hands that no improvement in the museum service could be expected until and unless the profession is placed on a sound basis in regard to the scales of pay. It was also felt that in view of the unsatisfactory scales of pay prevailing in the museums, it would be difficult, as experience has proved, to attract and retain bright students to the museology course or the museology profestion. It is hoped that State Goverments will find it possible to fix the scales of pay of museum personnel at par with the scales of pay of educational and university personnel.

International Cooperation

I am glad to note that during recent years international cooperation in the field of museums has grown rapidly. UNESCO has, in particular, envinced great interest in the field of museology and UNESCO'S regional seminars have promoted the understanding of the role of museums in the community. The pooled experience of experts assembled in these learned seminars is bound to raise the standard of museology. UNESCO has made valuable recommendations concerning the most effective means of rendering museums accessible to everyone. In particular, UNESCO encourages educational activities of museums. It also provides the services necessary to inter-

national exchanges of information concerning museums and of original museum objects. Technical assistance is rendered to member states at their request. UNESCO is assisting our National Museum in establishing a gallery of Western Art which will go a long way in developing better understanding of Western art in India. It has also offered experts and equipment for approved projects of the museums. In the field of conservation the International Institute for Conservation of Historic and Artistic Works, London, (IIC) and the International Centre for the Study of the Restoration and Preservation of Cultural Property, Rome (Rome Centre) have extended practical assistance to member States. The International Council of Museum (ICOM) founded in 1948 continues its important activities with which India has been actively associated. I am sure this net-work of international co-operation will grow further and museums all the world over will lend their important exhibits to other countries for mutual benefit. The recent visit of Mona Liza to the U.S.A. and India's participation by way of sending some of its most precious collections for "Five Thousand Years of Indian Art" exhibition at Villa Hugel in Essen, West Germany and later to the U.S.A. and other countries, are only a beginning of this trend.

To sum up the consciousness of museums as a potent factor in education and cultural development is of very recent origin in India; but this awareness has spread rapidly and new vistas have been opened for the more effective use of museums by the community. In spite of rapid expansion a great deal remains to be done for the meaningful display of the vast and varied cultural wealth of the country in museums to be established all over the country. To begin with we need to establish museums in all university towns in close collaboration with universities and as part of a process of linking the university closely to the community. Regional and city museums can be multiplied quickly. I am sure that a similar urge for expansion in the field of museums is experienced by the countries represented in the Seventh Regional Seminar of UNESCO. In this ever growing process of expansion, closer collaboration among the countries of Asia and keen receptivity to ideas and experiments from other parts of the world under the auspices of UNESCO can be of the greatest value in promoting the right of the individual to participate in the cultural life of the community.

A SYMPOSIUM

PROBLEMS & TRENDS IN MUSEOLOGY

D. P. Ghosh

The recent development of the museums and museum studies in India call for a detailed and careful appraisal. Museology is a comprehensive term covering both the theoretical and the practical aspects of museum management. The purpose and nature of museums as educational institutions, their role in the historical and social perspective are the basic considerations for their study from a theoretical standpoint. The practical aspects concerning the world of museums are varied and intimately related to their basic requirements. Collection of specimens, their fabrication and related documentation work are considered to be the most important technical features. Museums are generally established for the preservation and display of objects of nature and objects made by men. Conservation of specimens based on minute observation and understanding of their material composition as conditioned by the organic chemical and physical reactions on them, is another fundamental factor which influences museological studies to a great extent. In fact documentation and techniques of collection along with the methods of conservation constitute the bed rock of museology. On these twin bases the superstructure of museum display and exhibition for education and higher research supports itself.

The background of Museum Development dates back to more than one hundred and fifty years. Here we need not go into the details of the factors which influenced this development in its multifarious facets.

In short we may say that enlightened Englishmen like Sir William Jones and Nathaniel Wallich, associated with the Asiatic Society of Bengal, were indeed the pioneers of the museum movement in India as early as 1784, in humanities and natural history respectively. In fact these collections formed the nucleus of the Indian Museum, Calcutta, perhaps the greatest multipurpose museum in Asia, when it was opened in 1814. This movement gained further impetus from Indians themselves who wanted to have a greater understanding of the glorious heritage of the past, covering a period of five thousand years or so, illustrated by India's magnificent archaeological remains and the still continuing traditional arts and crafts. The establishment of the Government of India Surveys including the excellent work undertaken by pioneering botanists like Roxburgh and others in the Botanical Garden at Sibpur also contributed towards the growth of museums and museum like institutions in this country. In short the active European interest concerning all aspects of India's natural and cultural wealth intermingled with the patriotic Indian urge to underline both antiquity and richness of Indian culture, produced and strengthened the museum movement in India.

The period from the beginning of the present century to the end of British rule in India witnesses primarily the development of archaeological museums only. By and large, this development was however, handicapped by a widespread paucity of technical personnel and a comparative lack of scientific apparatus and application of scientific techniques. Concentration of museological centres at cities like Calcutta, Madras and Bombay, with big multipurpose museums, gradually focussed the need for a better distribution of the museum potential of the country and better museum arrangement. The first attempt at a kind of an overall appraisal of the museum situation in India was undertaken by the Museums Association, London. S. F. Markham and H. Hargreaves were entrusted to make comprehensive survey of museums in this sub-continent. The report of this survey was published in the year 1936 and this eloquently spoke of this need to overhaul and modernise museum service in India.

Landmarks in Indian Museology

The second world war and its aftermath saw the emergence of an independent India. It cannot be denied that as a direct result of this historic phenomena the museum movement received the highly needed inspiration and encouragement from the national government. The importance of museums in the educational set up of the country, was first highlighted by the formation of the Museums Association of India, as an adjunct of the Indian History Congress, at Benaras in 1944. For the last few years it is fortunately meeting annually as a separate entity. Another eventful step, the report of the Museum Expert Survey Committee in 1956 paved the way for the formation of the Central Advisory Board of Museums, by the Government of India. The establishment of the National Museum at New Delhi in 1949 with a highly competent management, which now leads the country in Museum

orientation, can be considered as yet another landmark of museum development in India.

It can also be mentioned here that as early as 1937 the University of Calcutta, started the Asutosh Museum of Indian Art—the first University Museum in India—which though handicapped by space and financial resources sought to interpret in diverse ways, modern museum ideals, besides its regular programme of archaeological excavation and exploration. Other factors of far reaching consequence of post independent era are the implementation of two years' comprehensive Post-Graduate Diploma Course in Museology at the Universities of Baroda and Calcutta under the auspices of the University Grants Commission in 1959, to train and equip the much needed qualified museum personnel. The enlightened policy of the Council of Scientific and Industrial Research in the establishment of Museums of Science and Technology, the encouragement given towards the development of Children's Museums under Public trust or Governmental management and the establishment of Planetarium in Calcutta also invigorated the movement in recent times besides filling up a conspicuous lacuna. Further inauguration by the Union Ministry of Education of Museology Camps for the intensive study of particular museological problems under the guidance of Dr. Grace Morley, the indefatigable and distinguished Director of the National Museum, the encouragement given to competent Indian museum men from different parts of the country for the study tours of foreign museums also contributed to a deep rooted understanding of museology as a subject needing a sustained study, envisaging to understand and appreciate the changing trends and rapid strides taken by modern museums abroad. The formation of the Museums Association, West Bengal in 1962, with its active programme of providing a platform for museum workers and popularising museums in this part of the country, has also shown the way how regional associations in a modest way can try to broadbase the movement.

In recent years, the definition of the term museum has assumed a more wider scope and meaning. According to the modern conception museums include all kinds of institutions where original specimens and actual things are displayed for public education. Naturally therefore, Botantical Gardens, Aquariums and Zoological Gardens with their collection of live specimens, herbariums, public libraries having a permanent display of rare books and manuscripts come within the scope of this terms. All kinds of teaching museums, specially those connected with the study of medicine and natural history in the graduate and post-graduate levels also fall within this category.

Cataloguing and Preserving Objects

With this background, let us now note the nature of progress in the primary functions of museum collection and documentation, preservation and education in India. The gradual expansion and multiplicity of museums in this country, have given rise to problems which can be properly met only by the adoption of the latest docu-

mentation techniques. All kinds of museum documentation require a rigid adherence to a definite code of rules, keeping in mind the nature and quality of objects kept by the respective museums. In this regard it is noteworthy that the Archaeological Survey of India, the Prince of Wales Museum, Bombay, the National Museum and the Crafts Museum at New Delhi have already taken up the work of keeping their museum records in highly flexible and technically sound card system catalogues.

The preservation of museum specimens was previously considered to be a simple job devoid of any need for a careful study and handling. Prolongation of the life of an object which is indeed a basic museum criterion, is a difficult problem in the damp tropical climate of India. As awareness of this problem of checking deterioration of museum objects by natural and other agencies is attested recently by the establishment of the highly efficient and well-equipped preservation laboratory of the National Museum and the bronze cleaning and preservation apparatus of the Government Museum at Madras. The stress laid on museum conservation as a compulsory subject of study in Museology Courses of Calcutta and Baroda Universities also deserves a mention in this connection.

Presentation and lighting

Suitable methods of presentation in the peculiar climatic and atmospheric condition prevailing in India is another problem giving rise to conflicting views. This placement of the exhibits is a subject which is conditioned by various factors including the controversial point of excluding natural light altogether. Some of these factors are related to the nature of the exhibits themselves as to their shape, colour, form and method of manufacture. However nicely placed a museum exhibition can seldom be attractive if it fails to show a meaningful and connected story. Even the depiction of a connected story within the museum gallery may not be of much benefit if it totally disregards the visual aspects of educational psychology. Presentation of exhibits in relation to atmosphere and background must change and vary widely. For this reason modern museum men working in the more developed regions of the world have already undertaken different types of controlled experiments. Selective judgment is applied to restrict the number of exhibits, educationally sound, to be installed within a particular display area. Psychological experiments of this kind can also be utilised for ascertaining the aesthetic quality or attractiveness of a particular gallery. In this connection, it is often forgotten by museum enthusiasts of purely artificial lighting, that Indian sculptures arranged in an archaeological gallery, formerly adorned the exteriors of temple walls and meant to be seen in the brilliant Indian sunlight. Focussed interior light fail to bring our the subtle nuances of modellings dependent on the changing course of the sun. Field experiments to closely observe the behaviour and response of rural people as undertaken by some UNESCO experts a couple of years ago in the rural areas of Mysore can also open up vast possibilities of utilising museum and museum techniques for the dissemination of agricultural, cultural and craft education in the rural

areas. It may be emphasised here, that a general awareness of the chaotic condition of museums in India, so far as their organisational and educational aspects are concerned, has led recently to a serious attempt at giving a face lift to galleries of the principal museums, specially in presentation and lighting, according to modern standards. In this regard, the new State Museum of Lucknow incorporates new ideas in a pleasing and effective manner.

Guidance and Extension Services

Educational programming with a view to correlating the school curricula with the museum programmes is altogether a new development in the museum world. Installation of travelling exhibitions and loan collections of museum exhibits in secondary schools can also be stated as a special feature of modern museum work. The introduction of the Guide Lecture System in Madras Museum, for the first time in 1941, followed by the Asutosh Museum in the next year were pioneering attempts. The establishment of the education department at the National Museum, New Delhi, the excellent school service run by the Maharashtra Industrial Museum at Poona and the latest endeavours of the Birla Industrial and Technolgical Museum, Calcutta, in organising touring shows in rural areas of West Bengal are, important steps in this direction.

Research, Publications and Fellowships

To encourage higher research, museums need a consistent policy of publications. Publications of standard type require a thorough scholarship and a thorough knowledge of the museum exhibits based on comparative study and other technicalities of book production. Some of them are intended to record the administrative activities of the museum while others are intended for popular consumption. During the last few years definite attempts are being made to raise the standard of Museum publications, specially by making them attractive and colourful. Multi-coloured post-cards of the Asutosh Museum, National Museum, Crafts Museum, Baroda Museum etc. have been greatly admired by the public. Scholarly catalogues, monographs and bulletins published by the Prince of Wales Museum, Madras Government Museum, National Museum and the Asutosh Museum, have greately contributed in the field of higher studies. Here, it may be noted that for a better research work in museum the Union Ministry of Education has already instituted, during the last couple of years, Research Fellowships in Museology and Museum Studies, attached to different museums in India. It need not be stressed that more such scholarships and fellowships should be added in the coming years not only to do justice to the museum treasures but also to make the people at large museum minded.

Museums in Educational Pattern

In India, it is the appropriate time to make ourselves more concerned with museums which can easily function as important instruments in the development of the country in all spheres. Unfortunately for us people here are yet to appreciate the import of audio-visual education. An urgent revision of the current educational system is needed to make them realise that real education should avoid unnecessary

verbalism and object reliance on printed books. Museum education can ultimately help in creating a generation of students who will possess a better understanding of the world around them and a better sense of aesthetic appreciation. For this a thorough integration of the Museum with all levels of educational system, beginning from the primary stage, is urgently required in India.

Mulk Raj Anand

The essence of the situation lies not in the erection of more ill-conceived mausoleums, but rather in reproducing the life-giving qualities, inspirations and impulses of the objects in the Museums, so that the individual may be helped to intensify his emotional and mental awareness and may be enabled to absorb the *quick* of those objects, in the inheritance of world culture, which may speak to us like John Keat's *Grecian Urn*, because they are part of the education of human sensibility for all time.

The Wonderhouses of the British

Unfortunately, the Museums of India were modelled by our erstwhile alien rulers, on their own 'wonderhouse' ideas, to amuse the public. Lord Curzon has left it on record that orientals 'like pomp and show' and must, therefore, be given the statues of kings and queens, and the regal splendour of the past, so that it may inspire in them worship and awe. And, in spite of the many enlightened efforts of the Britishers of the late 19th and early 20th centuries, every Museum tended to become an archaeological godown, where the latest finds from the old sites could be labelled and stored.

The problems of conservation certainly began to be faced but there could be no room for care, or display, or presentation,

in the light of the latest researches, particularly in France and U.S.A., because the old buildings were often dark and dingy and merely improvised structures in forts and palaces (as many of them still are like the Gwalior Archaeological Museum, the Kotah Wing of the Maharaja's fort palace, the Ajmer Darbar Hall, the Jhalawar shed, the Bharatpur stables, the Bhubaneshwar barracks, the Khajuraho temple courtyard) derelict woe-begotten areas of darkness which hide some of the finest works of arts amid a lot of broken statutory and junk.

After the transfer of power from British to Indian hands, our ideas of glory brought about, in a great hurry, a National Museum at Delhi, because the verandah and the entrance-hall of the old Viceregal lodge, later Rashtrapati Bhawan, were found to be inadequate.

Later, in the Deccan, all the curios of Salar Jung, as well as the most precious pieces, were annexed and a true national 'wonder-house' was opened to the public. Since then there have been museum camps and seminars and some of the problems of acquiring, preserving and showing important works have been discussed.

Apart from some of the devoted archaeologists and scholars, a few museologists have been trained in the only two departments for teaching museology, which are available in India, namely in Baroda and Calcutta. A very few students have been permitted to go abroad to acquire the new techniques, which are being practised in the west, in the U.S.S.R. and Japan. But the financial stringencies, old service rules, and almost total lack of awareness of the part which design can play in the display of works of art, still leaves the average museum an irrelevant aside of our vast bureaucratic system. The sincere, hard-working and enlightened curators fight a rear-guard action, in almost every museum, against the stranglehold of an obsolete system of general education.

Dead Treasures into Dynamic Centres

In view of this, it is necessary to discuss the moot points which lie at the root of the transformation of half-dead warehouses of treasures into dynamic centres, where creative works of the past, as well as the most brilliant products of imaginative arts of today, may communicate the values of the silent areas not only to those who look but those who wish to see, who hunger for the experience of the inner worlds of faculty and the outer activities of man's kinetic gestures, who wish to possess, if only for certain moments, the beauty, the grace, the charm and other man's heightened insights and technical perfections.

This is not the place to describe the process of *seeing*, as against *looking*, which seems to be important about a work of art and which, therefore, alters the conditions under which total experience, absorption, or *darshana* may be possible.

But let us analyse an art object which is generally put in a museum for contemplation.

Perhaps the inspirational centres, at the root of being, or becoming, of an individual of talent, are stimulated into the

organisation, with inborn, or acquired, skill of a number of experiences and renders materials into some shape, form or expression.

An Aesthetic Experience

Whether the original impulse was instigated by a patron, such as the temple or the church, in the ancient mediaeval period, or by the rich feudal lord, or merchant, as in the renaissance, or by the commercial gallery, with its clientele of businessmen, as now, the genius for construction, organisation and expression, accomplished by the master of materials, with the highest devotion, has sometimes led to the adumbration of certain qualities, which bring the living experience of forms of nature and human life, into new creative expressions, that communicate a subtle empathy, variously described as *Rasa, Dhvani,* beauty, or merely as aesthetic experience. Sometimes, this experience has been likened to the transcendant mystical state of awarenesses, which is the end of religion. At other times, it has been mixed up with mere bigness, splendour and majesty of shining forms, or with richness, glory and immortality. Again, it has been mistaken for sensational experiences of the merely hedonistic impulses. But it has been always under discussion, from the earliest times of civilisation till today when it has come to be called 'negative capability.' At any rate, it is the kind of experience which human beings, at certain levels of sophistication, sincerity and depth, hunger for, when they go to art objects.

And, in spite of many differences of opinion, there are certain works of painting, sculpture and the minor arts, which have been established, by the common consent of millions of viewers, as likely to communicate this kind of aesthetic experience.

The admonitions of the Mistress by Ku Kai Chih, the *Venus De Milo,* the *Seated Buddha of Sarnath,* the *Last Supper* by *Leonardo,* the *Adam* by Michael Angelo, the *Death of a Princess* in Ajanta, the *Self Portrait* of Rembrandt in the Mellon collection, *The Horrors of War* by Goya and some of the prints by Hoku ai, a few miniatures of the Bihzard School, all these, and many other works, have been acknowledged as "masterpieces".

Communication of Rhythmic Life

And if a masterpiece be interpreted as a work which, under constant examination, by many sensitive and knowledgeable people, over a period of time, confirms the familiar feelings, the deepest urges, and the highest expectations of the human imagination, in the organisation and rendering of forms, so that it is capable of communicating something which is called the rhythmic life, then, inspite of differences of opinion about how perfect or nearly perfect, is a work, we tend to separate it from many other creative works and make it part of the treasure of a house, a gallery or a museum. And we feel that other people should share our experience by going to it, with some degree of reference.

Unfortunately, this tendency to contemplate works of art, in order to receive

the communication of life to life, creativeness to creativeness, the *quick*, as it were, has arisen only in periods when the concept of fine art, as distinct from religious, hieratic, or commercial art, became established in human civilisation. And, because of the many factors, which made the highest expression of fine art difficult to understand, by the vast majority of people, the whole aesthetic experience has been deprecated as rare, snobbish or high flutin, and out of reach of the masses.

Perhaps this contradiction that the age of democracy, equality and advance of knowledge, should produce works of art, only communicable, from a small *elite* to a smaller *elite*, was inevitable. As scientific knowledge grew into greater complexities, so the expression of creative genius in artforms also became relatively intricate. But, whereas, most people can easily accept that an average intelligent person must have an M. Sc. degree to understand a theorem of higher physics, chemistry or mathematics, everyone is supposed to be born from his mother's womb possessed of the complete capacity to judge beauty, through the various phases of human civilisation. But we know that to take in the experimentalism of present achievements of artistic expression, beyond the various high points of further synthesis, requires that the intelligent viewer may at least read the history of art of his own country, if not of world art, to understand, to some extent, the values sought to be communicated. It may be necessary for many young people to go through a course of studies for an M. A. degree, in order to possess enough awareness to guide and teach the less privileged section of world society, to make more and more people accept the inner vitalities, rhythms and ecstasies of works of art.

It is likely that the future universities, everywhere, will include faculties of Fine Arts, as necessary part of the discipline of teaching in the humanities.

Complete Physical Communication

Meanwhile, it is important that each old museum, which can be adapted, and certainly every new Museum, must be so constructed as to afford the physical possibilities for as complete a communication as possible, of the inner values of the silent areas of major works, and the vitalities of objects of minor arts to a larger number of people than has been hitherto possible.

The New Temple

This means that the Museum might become a new kind of temple, where the pilgrims will go, not to become holy, or to seek god, or immortality, but to cultivate those energies, intensities and perfections, which may make them into gods. The time of blind faith may soon be over and more and more people may demand the opportunities for the cultivation of the individual body-soul. And no civilised society can refuse people the culture centres where alone, under modern conditions, the maximum experience of the inner life can be ensured.

Centre of the Muses

Actually, the word Museum means the centre of the muses. This implies, in its turn, that all those arts must be assembled in its various parts, which may help the

understanding of an expression in one of the arts.

We may begin to have newly constructed Museum cities, where not only the many arts but the many sciences, and the facts of the practical life, can be taught to children, through the various new techniques of audio-visual communication, display and design.

Already, such houses of knowledge have been thought out and planned by pioneers like Le Corbusier, Frank Lloyd Wright and Walter Gropius, and only wait for funds to be realised. Thus the museum today has to achieve a new kind of synthesis between architecture, sculpture, painting, the graphic arts, and well-made objects of daily use of the past and the present. And just as some of the best specimens need publicity material in the form of words and photographs and prints, as aids to communication, so recorded, or live, music, and dance, and film may become essential for achieving the areas of understanding where spiritual equations are possible.

Mobile Galleries

The periodical changing of the exihibits for comparison and contrast as well as for the exposition of important works kept in storage, would help to make the Museum galleries more mobile. And parts of such exhibitions could also be taken in travelling vans to the people who can seldom have access to the Museum in a big town.

The minimum conditions, which may emerge from the new, functional attitude would probably be less costly than the usual expensive building designed for showing off the might of the nation, with domes and minarets to overawe the people about the miracles in the wonderhouse.

Soothing Environs

Certainly, the new museum will come to be constructed in the traditions of the new humanist architecture, preferably slightly away from the busy commercial centres. It would usher the visitor into an integral miniature world of its own.

The landscape gardening would be achieved in such a way as to calm the excited nerves of the usual neurotic product of the hurry and scurry of the industrial metropolis. In the entrance hall, after the ticket is bought, the slot machine would play the recorded music, which may stimulate the body-soul for the experience of the kind of pictures hung in the galleries for the week or the month. For instance, the drumming of Chaturlal might be a good prelude for the seeing of some phase of expressionist art. A violin recital by Yehudi Menuhin might discreetly release those nuances, which may conduce to the subtle and pervasive influence of Braque, Kandinsky and Klee. Similarly one of the Shaivite hymns may serve as a precursor for the absorption of a south Indian bronze.

Calm and Ease in the Temple of Muses

After a three minute calm acceptance of music in the foyer, the visitor would go into the rooms with his rough edges toned down. And, there would be not more than one or two works in any particular small gallery on view, say one painting and a sculpture. The visitor would not have to stand about, as he is usually supposed to do for the looking, but be

provided sitting accommodation to relax while he seeks to see, or absorb, the work of art. The slot machine would provide the commentary on the work of art with a pushbutton technique. And if the values of the piece are not communicable or suggestive easily enough, it is quite possible to have film projection of the process through which the artist has brought the work about. This has already been attempted for pictures like the Leonardo's *Last Supper,* Picasso's *Guermica and Goya's Horrows of War.* Only fourteen or fifteen persons may go through the various galleries in a small Museum, where there is no guide, groups of five to seven could be taken, at intervals of a quarter of an hour or so, through the galleries of a big museum. At the end of the tour, prints would be available of the works of art displayed to take home for renewed, acquaintance and private contemplation. The cafe outside the Museum would be a necessary adjunct to meet one's friends and exchange reactions to the work seen, and to be able to feel at home in the Museum. The discussion, controversy and general talk about artworks must be encouraged among young people, because it would be the expression of genuine enthusiasm about the value of the works to test various hypothesis. The supposed false politeness of good manners, when there is no controversy, tends to drive underground all genuine opinions and puts a premium on ignorance. The auditorium of the Museum would provide short films on the works of each artist, or on particular works, and these would be running all day, so that visitors could walk in at will and live for a sufficiently long period in the atmosphere of a period of art, or among the creations of a great master, or in the realm of one important piece. In this way, the museum would connect the absent artist to the public through the comprehensive realisation of the deeper sources, stirrings and inspirational centres of creative art.

I do not presume that all the established big museums can achieve this kind of confrontation between the onlooker and the work of art. We may need to begin this process with specially designed small museums. But the monumental museums could begin to reorganise their collections, display, furniture and publicity arrangements, as well as recreation rooms, and auditoriums, in this way, gradually, until the whole museum can be converted, away from the archaeological godown, to the semblance of a centre for total visual experience of significant forms.

In this context, it may be necessary to reorient our ideas, away from centralism into decentralisation, in order to cope with the demands of our growing five hundred million people for culture centres which may be accessible to them.

National and Specialized Museums

Of course, there would be the five national Museums in the five regional centres of north, south, east, west and centre of India. The rest of the museums could, by regrouping of collections, become specialised museums.

For instance, it is quite possible, by judicious regrouping of existing collections in eastern India, to have a museum of Far Eastern art in Calcutta.

By the same process it is possible to have a Museum of South East Asian art in Madras.

Similarly, it would be feasible to have a museum of Western art in Bombay.

There is already a Central Asian Antiquities section of the National Museum in Delhi. This could be given more gifts of loans and be separated and strengthened to promote future growth.

There should be small museums of modern and contemporary world Art in almost every university.

This scheme is not utopian. Because, wherever it is difficult to assemble a sufficient number of works of art, in any particular museum, to fill in a chronological order, it is quite possible to have colour transparencies, photographs and large size prints, of almost all important works of world art, supplemented by films, which already exist or could be specially made, to cover, unrecorded periods, personalities and perfections.

Equality for Old and New

Also, in this context, in view of the present situation of the imbalance between the representation of ancient heritage and modern achievement, I would plead for growing emphasis for equality of treatment of the old and the new. I would even ask for the tilting of the scale in favour of the contemporary, for sometime to come. For it is obvious that, through hundreds of years of neglect of world art, from the enforced disconnection brought by foreign rule between ourselves and other countries, we have tended to seek compensations for the paucities of our present in the admittedly magnificent and splendorous creations of the past.

But, in the period of inevitable drift towards one world culture, based on our concept of universalism and co-existence, we will inevitably have to live with all peoples of the modern world and inherit the best and the most vital creations of other cultures in tune with the spirit of man, which is bound to prevail if there is no third world war.

Folk Arts and Crafts Museums

There is the other, immediate, need for the organisation of small folk arts and crafts museums in almost every big village or small town, so that the fast disappearing products of mature skill of our traditional artisans can be preserved. These exhibition rooms may be linked up with the monuments for the resurrection and transformation of our handicrafts, which, in the present transition, are already providing employment to quite a few millions of our craftsmen. The study of old models, the assimilation of their vitalities, and the careful reorganisation of new forms on the basis of traditional design requires research material in every region.

Sectional museums of single craft, like textiles, lacquer, ivory work, jewellery, toys etc., can be brought together with some ease at the present moment, before the precious things have been sent out of the country or destroyed: private efforts like the Calico Museum in Ahmedabad have shown the way in this direction. The patron class needs to donate money for such efforts with more open hands, because such investment would come

back in improved techniques and greater production of quality goods afterwards.

The small specialised museum for industrial techniques has already got under way through the munificence of Birla Brothers in Calcutta (in collaboration with the Council of Scientific and Industrial Research), as well as through the inspiration of the great technologist Vivesvaraya in Bangalore. But these two efforts are not enough to cope with the future of our fast developing industrial economy. I would suggest the foundation of such a museum in each industrial complex.

The museum movement can really come to fruition during the next quarter of a century, when our children will be compelled to seek knowledge and awareness of the past and the existing worlds, in order to assimilate the potential of the discoveries of the new expanding universe. I would, therefore, suggest the creation of Bal Bhawan-*cum*-Museum in every conceivable village, town, suburb, where it can be promoted by private and public effort.

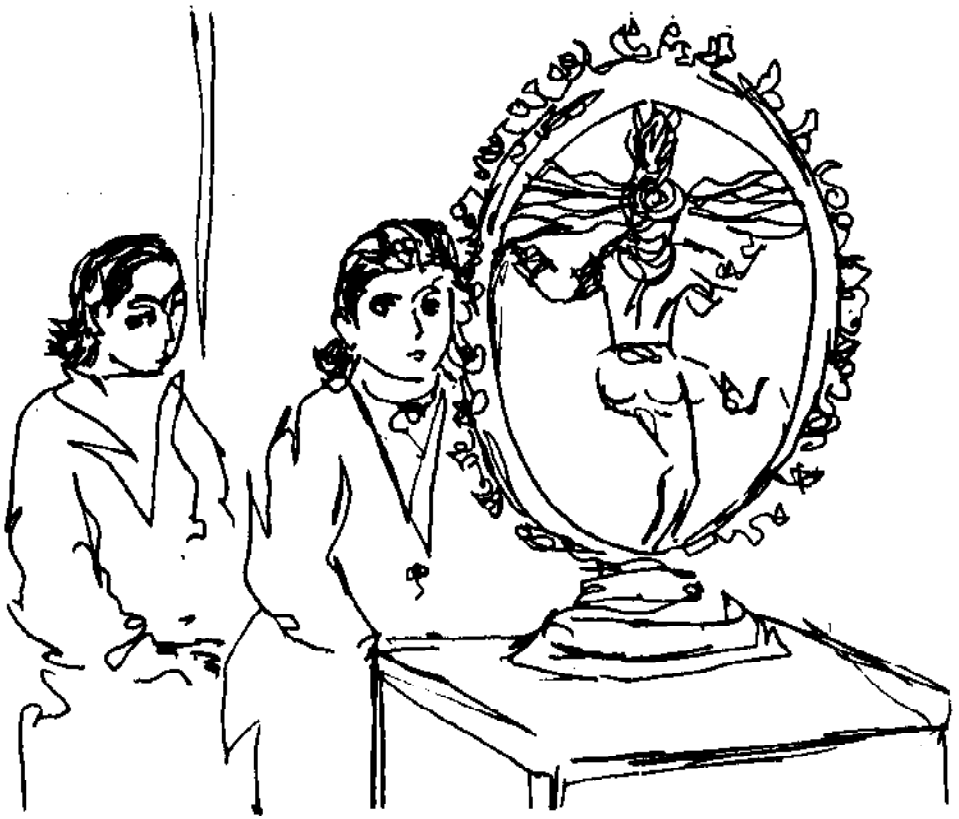
If the need for such efforts seems to be irrelevant to those who think that "all art is useless", then I think it is important for our enlightened Republic to devise a new education system, so as to incorporate the fundamental idea that the release of creativeness in every way, by arousing the curiosity and the desire for beauty, is the only way to make individuals of any significance and worth in the future society. The non-inclusion of these aims in concrete syllabi in the schools and colleges of India, will mean the release of violence, discord and sensationalism, as in the west, which neglected creativeness in the early phases of the industrial revolution. Only a released generation can reconstruct our society and help the sick world order to proceed towards a comparatively peaceful, disarmed, universalist society, from which violence may be eliminated. Otherwise, we shall ourselves be issuing forth new generations of vipers and scorpions, to joint the millions of disgruntled, apathetic and despairing young, who are the current products of the nation-states, based on armaments, suppression and spiritual death.

Peace Time Achievements

Of the war-like civilisations of the past nothing remains, but of the peace time constructions in architecture, sculpture, painting and handiworks, of the Pharaohs, the Chinese, the Indians, the Greeks and the Mexicans, we have some remnants shored against our ruin.

The works of genius, which make visible, audible or tangilbe, the intricate phenomena of human aperception, become radiating centres, from which the cue of passion for further experiments is born; and thus emerge the variegated forms of the different communities of the world from the enlightened will of those individuals who "connect" the poetry and the prose of life.

It is likely that we will bypass the deeper processes of creative art merely by insisting on glory, splendour and richness, so that we ignore the real life of the actual treasures, the absorption of which into our own lives forms the nucleus of human growth, at higher, ever high levels of awareness?



V. S. Agrawala

The highest ideal of a modern museum should be that of a cultural centre. It should comprise three limbs corresponding to three-fold functioning well integrated with each other. A good museum should function firstly as a collection of well-arranged exhibits and antiquities in the galleries with proper labels, backed by relevant registers and records of acquisition and description of its contents; secondly, as an active educational institution in which all members of the staff strive to disseminate educational information by means of research centres and lectures in the galleries and in the theatres and thirdly as publication agency of illustrated and documented hand-books and catalogues on several planes for different kinds of audiences visiting the museums.

Handbooks, Guides and Catalogues

The publications should be eloquent, with scientific information about the exhibits in the collection of the museums, both in show and held in the reserve collections. The guide-books fulfil an essential purpose in educating the visitors to the museums' galleries. Each efficient curator or keeper takes genuine delight in the preparation of these guide-books and hand-books with a view to making his exhibits and antiquities eloquent to the public who come to the museum as a centre of cultural education. In fact, the aim should be to produce a number of hand-books relating to different classes of objects and antiquities. It would be in the fitness of things to illustrate these hand-books with figures of such objects as are worthy to be seen and which occupy a place of honour in the museum collections. The curator ought to know how he should explain and what he should say to the visitors to supply full information about the objects in his custody. On a higher level should be planned series of catalogues which speak about the antiquities to the world of scholars. In such publications the keeper becomes a professor delivering well-studied lectures at the colleges and universities. Thus he reaches a much wider audience and in reality puts his museum on the Standard catalogues like the six volumes written by Dr. Coomaraswamy for the Indian art collections in the Boston Museum become a joy for ever and a perennial source of academic learning imparted to the scholarly world at large

A Series of Rich Catalogues

Fortunately in India we have quite a number of excellent museums with rich specialised collections of sculptures, paintings, textiles, bronzes, arms, clay figurines and other art-objects. When viewed from close quarters these collections form an invaluable source of history, culture, and art study. As such they should be properly presented with the help of authoritative catalogues, richly illustrated and sumptuously produced with the stamp of scholarly authority that comes after years of proficient handling of museum objects If within the next ten years, 25 volumes well-planned in their scope, are produced on the various classes of objects in the collections of important museums of India accumulated during the last 100 years, it will be of inesteemable value to national culture and to humanity in general. Such a library of catalogues will raise the standard of museums and open a window through which new horizons of knowledge could become possible. For this it is essential to plan in a firm manner so that the work progresses at the desired pace and completed within the reasonable time.

For such museums where at present proper talent is wanting, a group of peripatetic scholars should be deputed to catalogue special branches of art and archaeological material according to a stipulated standard. This step is necessary to cut through the veil of darkness that has enveloped our national collections, about which the world is anxiously awaiting to know in detail and in a trustworthy manner.

The Unique Art of Mathura

For example, the collections of the Mathura School of sculpture in the archaeological museum at Mathura is of interests to the whole world and a comprehensive catalogue of the same should be prepared without losing any more time. Mathura is the Athens of India. In the matter of its cultural productions, the half millenium from the 1st to the 5th century A. D. was the formative period of the Mathura School and its active workshops were instrumental in creating an art of amazing originality and prolific quality. What Mathura did no other centres of art in India was able to do. During the reign of the great Kushana emperors which marked the influence of the Buddisht, Bhagavata and Jain religions, Mathura artists gave concrete form in sculpture to the spiritual aspirations of the people in those stirring times. Influences from the monuments of central India, from Magadh, from the Hellenistic North-west and from Iran converged on the ateliers of Mathura which produced an art of such great dimensions preserving many an unwritten chapter of cultural history. Like sculpture, Mathura was also the richest centre in India of manufacturing clay-figurines, several thousands of which have been preserved down to our own times. Incidentally not only did it produce the classical goods and goddesses but also presented a unique group of Scytho-Iranian male and female figurines with their characteristic physiognomical features. These have not yet received the attention of scholars of which they are worthy as constituting a chapter of international relations between India and her Western neighbours of which archaeology supplies firm proofs.

Lucknow and Allahabad Museums

The Lucknow Museum also have a rich section of Mathura sculptures from the Jain Stupa of Kankalikila which show much originality and creative skill. Its special feature is an exceptionally rich site collection, which deserve to be properly catalogued since it includes numerous tribal and punch-mark coins and hordes. The copper plates section of this Museum is a class in itself and should similarly be publicized. The Museum at Allahabad has a noteworthy section of the scattered sculptures of Bharhut Stupa but its unique treasure consists of the terracota figurines from the ancient site of Kausambi. The majority of them belong to the Sunga period (2nd, 1st Cent. B.C.) and are unparalleled for beauty, variety and typological richness as documents of social and cultural history. Indeed, an illustrated corps volume on the Kausambi clay figurines would at once raise the standard of Indian terracotta art and put it on the archaeological map of the world. Aesthetically, the Kausambi clay-figurines are equal in beauty to those from Taraga in Greece and are not less important in documentation than the clay figurines from Salucia.

Bharat Kala Bhawan

The various collections of the Bharat Kala Bhavan at Banaras Hindu University constitute a unique class and are of material value. The collection of paintings numbering about 10,000 is the richest in this country and their speciality is that

they are of choice art value being brought together by one of the most discriminating art critics of the present generation, Sri Raikrishan Das, who has been the leader of the Museum Movement during the last 50 years. The catalogues of paintings in the Bharat Kala Bhavan should be planned on the model of the Boston Catalogue and executed in the near future by those who are knowledgeable. The collections of clay-figurines and textiles in the Bharat Kala Bhavan are also sizeable and of great value because of their individuality as select specimens from the viewpoint of art and beauty. They also should be presented through appropriate catalogues and monograms.

Patna and Calcutta Museums

The Patna Museum in Bihar has several points in the matter of collections, *viz.* Bronze images from the site of Kankihar which are unique as examples of post-Gupta metal art that influenced the art of the Pala School and eventually of greater India. The collection of clay-figurines in the Patna Museum is of high value that impresses the visitor by its richness, quality and antiquity. It includes an exceptional group of female dancing figures wearing flounced skirts that are reminiscent of Greek originals that cast their influence on the Mauryan Court of Pataliputra. These figurines are without parallel in the realm of Indian terracotta art. Calcutta has two Museums, *viz.* The Indian Museum and the Asutosh Museum, the former having rich collections of sculptures and coins of surpassing interest and the latter specimens of folk-art from many places in Bengal including Pata paintings, scrolls, and terracotta plaques.

Bombay and Hyderabad Museums

The Prince of Wales Museum at Bombay has collections of material importance in the field of paintings, illustrated manuscripts, metalware and arms, as also coins. This Museum presided over by its present talented Director is placed in a position of advantage in the matter of the planning of its catalogues and this opportunity should be seized in proper time. The Salarjung Museum at Hyderabad although apparently incongruously assembled, is yet rich in illustrated manuscripts and in bejewelled hilts of daggers and swords, specially from the Deccan.

Madras Museum

The Museum at Madras is the proud possessor of a rich collection of Amaravati Marbles which are worthy of as high class reproduction as modern printing techniue would make it. But the soul of Madras Museum consists of its rich Bronzes which are the pride of the Pallava period and modern times. Such a collection exists nowhere in the world and it bespeaks of the glorious traditions of metal casting which the Stapatis of the South cultivated as a result of expanding genius for originality in ideas and refined techniques.

National Museum, New Delhi

The National Museum at New Delhi beginning from its recent foundations has been fortunate in building up several important branches of collections of art and archaeology. Worthy of special men-

tion is its collections of paintings of Rajasthani, Pahari and Moghul Schools of which the number may well nigh be over 5,000. Its collections of Central Asian frescoes is unique and deserve to be specially presented by means of coloured photographs. Even more important is its collections of Tanka paintings also from Central Asian monasteries which also deserve to be described in detail and reproduced in colour for the light they throw on the pictorial art of Central Asia from the 7th to the 10th century A.D. With diverse influences from Iran, India and China and all dominated by Buddhist themes of great importance serving as a mirror of the various Buddhist disciplines of Dyana and religious Sadana pursued by peoples of many races with Buddha and the Buddhist heavens occupying the central position in the pictures.

The Numismatic cabinet in the National Museum is sizeable and deserves to be examined from the point of view of the preparation of catalogues. The collection includes several important series as the punch-mark coins, Gupta gold coins and the Sassanian coins. The archaeological material from several excavated sites has been accumulating in the National Museum and it is now time that it is properly evaluated and studied after proper classification, identification and description.

Museum a Research Centre

In the above illustrative survey of the principal collections in the major Museums of India, we have to some extent indicated the need for research in relation to the development of the Movement. The preparation of standard catalogues would include advanced research work and will lay the foundation stone for many-sided academic investigations based on learning and original studies. But research cannot be limited to the only work of cataloguing. Research is the eye of wisdom that soars like the eagle high up in the heaven of intellectual sunshine and brings with its purview many unexplored fields of knowledge. Of course, such research relating to the history of art, archaeology and the culture of India on the basis of its antiquarian remains and literature will to a large extent derive its force from the talented insight of individual scholars who may happen to preside over the Museums. By flashes of intuition they may be able to explore new fields and contribute chapters which would most likely enrich our knowledge of Indian culture, history and art.

The above triple approach in the development of the Museum Movement in India which deserves to be financed both by the Indian Government and the UNESCO will lead to the total assessment of the value of Museums as centres of culture and education. A good Museum, active on all these fronts should be considered as important as a fully organised college or University and the problem deserves to be tackled on the same level and with the same generous understanding.

C. Sivarama-murti

The Concept of The Museum

Though the concept of the modern museum in India is over a hundred and fifty years old, it is only in recent years that the more important museums of India are trying to line themselves up with the more developed museums in Europe and America. The museum of the nineteenth century all over the world and naturally also in India was a repository of valuable, interesting and aesthetic object. Art, archaeology, anthropology and Natural history have been the material theme of the museum gallery. India, being a vast sub-continent littered all over with ruins of monuments of great architectural importance, sculptural beauty and wealth of murals, has naturally supplied the earliest instituted museums with archaeological and art material of great significance and worth. Obviously, it was, in the natural sequence of development, for this material either to dominate in multipurpose museums or in museums that sprung up in large numbers entirely devoted to this. Where learned societies with a range of subjects engaging the attention of scholar members instituted the idea of a museum, like the Asiatic Society in Calcutta and the Literary Society in Madras, museums were conceived with departments for art, archaeology and natural history.

Spate of Growth of Museums

Several museums arose in a spate of growth through the enthusiastic exhortation for their inauguration by an eminent archaeologist like Sir John Marshall and with the utmost support and backing from the highest fountain of help, the then Viceroy of India, Lord Curzon, who was endowed with a very keen perception and feeling for art and aesthetic appreciation. The archaeological department itself owes its well-defined pattern and stable existence to his anxiety for the preservation of the glorious monuments of India. Touched as he was by the charm of the Taj Mahal beside the Jamuna against the moonlit sky that appealed to him as one of the thousands similar to it and set him reflecting on the possibility of their decay

and disruption. The then princely States through their enlightened rulers vied with one another to have museums set up all over. As was to be expected these were mainly devoted to the sculptural, epigraphic, numismatic and other art and craft wealth in the state.

The site museums, started by the Archaeological Survey to preserve and present excavated material on the spot, have multiplied and are still numerically getting stronger with the policy of expansion of this type of museum by the Archaeological Survey.

Even in the field of art it was very rarely that the thoughts crossed the confines of the state. There was almost no idea of a museum presenting the artistic achievement of the country as a whole. It was only the recapitulation of a regional glory.

Regional Character of India Museums

Even the Indian Museum with its all-India resources mainly concentrated on regions comprising the vast Presidency of Bengal which by itself then enveloped what are now four separate states—Bihar, Bengal, Assam and Orissa.

When the galleries in the new extension were arranged in the Madras Museum in 1940, Dr. Gravely for the first time brought together in a regional museum a complete picture of Indian art representing all the schools with select examples of each. When one sees Indian art collections in museums in the West and in the United States of America, one has a better understanding of Indian art than in the rich provincial collections in State Museums in India, as herein no effort had been made to supplement the vast regional collections by examples of other schools for comparative and historical study. When over a decade ago a large collection of Hoysala sculptures was added to the Archaeological Section of the Indian Museum, it enriched it in southern material as never before, thanks to the munificence of the Government of Mysore. In recent years, this need has been keenly felt in several museums and there is now a desire to enrich collections with a logical and intelligent variety from all over the country to represent its art wealth.

The First Attempt at an All-India Museum

The National Museum which is keen on a programme of exchange of art material in India and abroad has focussed its attention on this important problem. It has already made a start. With its rich and varied collections, the National Museum, though very recent in its origin, has, under the guidance of Dr. Morley an ambitious programme of representing not only all the varieties of Indian craftsmanship during the ages in different media all over the country, but has also set itself to the acquisition of suitable examples to represent Western art in fulfilment of a scheme sponsored by the UNESCO for establishing a gallery of Western art worthy of Asia to enable better understanding and mutual appreciation of the cultural achievement of the East and the West. When this is achieved in the course of a few years and the gallery established suitably, as it should be in the next phase of the building of the National Museum, the urgency of starting of which is all the

more imperative because of this and various other causes, it would, undoubtedly, be a tremendous material success in Asia for understanding the artistic achievements of the western world.

Effective Display of Exhibits

The tendency in the presentation of museum material was all along everywhere in a spirit of pride of possession and a vanity to show bulk. Naturally the galleries were crowded. No great space for reserve or study collections was either needed or thought of as none would be allowed usually to be away from the gallery. Today the idea of presentation is to be selective, not to distract attention by a crowd, and to give due importance to aesthetic sense in showing an object in the best possible manner having in mind the ultimate important aim of educating the public and arousing their aesthetic appreciation. It is this aim of the Museum gallery at intelectual pleasure and profit for the visitor that has brought about the ideal presentation of just a few objects effectively displayed. A variety of techniques, modes in building up cases to draw special attention to the object alone and elimination of all other distractions by focus of light on the object and its control from outside, comparisons and contracts of allied material, effective labelling, bringing together of groups to flash an effective picture of a culture and so forth, have all made the subject most attractive and attention-engaging.

The Hall of the Muses

Today the museum gives a more effective lesson to the students from school or college than probably the classrooms themselves. This is more and more recognised in the West where classes are actually conducted in the museums. The lectures, carefully selected film shows and conducted tours in some of the Indian museums today and particularly in the National Museum are approaching slowly the fulfilment of the educational purpose of the museum which really makes it the hall of the muses.

Children's Museums

The care and attention for the special needs of the education of children has, in recent years, so much engaged the attention of museums that special children's galleries in existing museums and children's museums by themselves are coming into existence. The National Children's Museum, Bal Bhavan, New Delhi, the Amreli Children's Museum, the Motilal Nehru Bal Sangrahalaya, Lucknow and a recently built annexe of the Madras Government Museum are examples.

University Museums

Universities within the last few decades have started thinking in terms of suitable museums with adequate material as a mode of initiation and instruction. The Asutosh Museum of Art, Calcutta and the Bharat Kala Bhavan, Banaras and the Dharwar Museum of the Karnatak University are, indeed, functioning nearly as well as the Ashmolean at Oxford or the Fogg Art Museum at Boston though with only a limited range of material.

Scientific and Technological Museums

Museums of science and technology have already been started in India also and are making rapid strides. It would

be interesting in this context to recall the vast potentiality of such museums as the Deutsches Museum in Munich and the Science Museum at Chicago in a country's progress in science, industry and technology. It is a pity that the small but potentially great Science Museum formed at Delhi is now no more there. But it is heartening that the Birla Science and Technological Museum, Calcutta and the Visvesvaraya Museum, Bangalore are progressing as they should.

A remarkable museum of recent origin is the Calico Museum of Textiles established in 1949 at Ahmedabad by Shri Gautam Sarabhai. Museums exclusively devoted to the exposition of crafts are usually meagre and it is, indeed, a great achievement of the Handicrafts Board to have established a Crafts Museum, a building for which is nearing completion.

Natural History Museums

Natural History Museums in India have usually galleries only to represent a stuffed range of species of animal, bird and reptile. Magnificent dioramas of magnitude and splendour like those in American Museums as at Chicago, Washington or New York, are practically unknown in India, but for the solitary exception of those in the Zoological galleries of the Prince of Wales Museum, Bombay, which have been possible, through the splendid co-operation of the Natural History Society of Bombay with the Prince of Wales Museum coupled with the munificence of the former princely States of India that contributed generously to prepare them effectively. The services of Prater and C. M. Inglis in this connection are noteworthy. The Natural History Museum of Darjeeling which is the only one devoted entirely to that subject is an instance of a museum built up by a regional Natural History Society. In the Madras Museum the experience gathered in American Museums has been utilised by its Director to re-arrange some of the galleries. But due to lack of funds he had to be content with miniature dioramas which cannot really be as effective as full-sized ones.

Geological and Botanical Galleries

The Geological galleries in the Indian Museums are so crowded and confusing, that the visitor, unless he be a specialist anxious to study something in particular, moves out as quickly as he can, as there is nothing that can compel his attention and prolong the duration of his stay in the gallery. On the other hand the geological galleries like those of the Washington Museum of Natural History compel the visitor to stay hours and almost get lost in admiration of nature's riches that he is made to realise so vividly for the first time. This is yet to be achieved in Indian geological galleries.

The growing consciousness for the conservation and preservation of art material in the West that accounts for such meticulous care of objects in the museums has not lacked its counterpart in India. Till a few decades ago it was still the stage of collection and appreciation: the possibility of deterioration and decay and the necessity for protection then came to be recognised; and probably the first Museum to have had a laboratory of its own, apart

from the Archaeology Survey itself, was the Madras Museum. The National Museum fortunately has had, practically from the time it could function in its own building, a laboratory worthy of its vast and varied material. There has been such excellent work turned out in this Laboratory that apart from the care, preservation and conservation of an infinite variety of material ranging from paper and textile, wood and bone to terracotta, stucco and stone, several murals in the last stages of decay and ruin have been saved from dilapidated palace walls in the Kangra Valley. They have been taken down carefully, peeled off the walls, remounted and set up almost in original state in a gallery of the museum. Thanks to the vision of Dr. Morley, among the numerous young scholars from the museums that have gone abroad, there are many from chemical laboratories, and this special training in the well equipped laboratories at Brussels and Rome has meant very much in the efficient tackling of problems of conservation in the Museum laboratories in India. Thanks to the good work done by this laboratory, it is being recognised as fit for being a central one for South East Asia to function as a regional laboratory envisaged by the UNESCO.

The Need of Regional Laboratories

With the awakening of this sense of care for objects in museums all over the country, the craving for laboratories individually for each museum has been developing rapidly almost everywhere in India. But a well-equipped laboratory is not really so easily established with lack of adequate local resources, not to speak of foreign exchange which is really more essential for the importation of laboratory equipment. Hence, for the moment, probably, this regional centre, the laboratory at Madras and the laboratory of the Archaeological Survey at Dehra Dun may have to help all the other museums as far as they can. Though the thinking in regard to the care and preservation is in the right direction handicaps that act as a practical restraint on the fulfilment of this dream of creating laboratories for each museum may have to be realised and, however unwillingly, museums may have to acquiesce in submitting to the inevitable and try to disengage themselves in frittering away their energy in setting up ill-equipped laboratories and rather concentrate on a few fully equipped regional ones.

National and International Collections

While the pattern of art museums in Europe and in the United States conforms to a presentation of achievement of man all over the world by a get-together of Egyptian, Assyrian, Greek, Roman, Chinese, Japanese, Javanese, Cambodian, Iranian, Medieval European and other material including Indian, India has not even a country-wide picture of its art in several of its museums. It is not yet conscious of presenting the art of the world to the students, scholars and laymen that go through its galleries. By a rare chance, thanks to the exploration of Sir Aurel Stein, the National Museum possesses one of the four large collections of Central Asian material in the world. To understand this properly the culture and art of all the elements composing Central Asian art should be studied. It means, in

short, that galleries should be available in the National Museum for the study of Chinese, Japanese, Cambodian, Javanese, Iranian and Graeco-Roman art of Hellenistic Asia Minor and Bactria. As a preliminary to the study of Greek and Roman art would come in Egyptian and Assyrian art. The National Museum is naturally having a programme of development in this direction also.

Museum Publications

Except for the Madras Museum and the Prince of Wales Museum very few in India have had a publications programme except occasionally for annual reports or small guide books. The National Museum has been not only producing books worthy of its name but winning awards every year on account of the quality and beauty of its production. This is one of the most important aspects of Museum work; and books of sufficient standard in text and illustration produced in the most aesthetic fashion are awaited all over the world very eagerly by scholars in the field; and the standard should not be reduced in any manner whatsoever.

Acquisition of Art Objects

In the acquisition of material also, the outlook of museums in India is slowly changing and Government, both in the States and at the Centre is coming forward with greater liberality to help acquisition. A quarter of a century ago, a whole collection of masterpieces that could have been procured then for a sum which would not fetch a single piece today, would not be made easily available. Fortunately the position has now changed and a lot of funds are readily made available to acquire one or more items according to their importance. Directors of museums draw freely on the specialised knowledge of individual scholars from all over the country who are consulted on committees before purchases are made. It is thus that really important collections of very valuable art objects of different categories are assured.

Courses in Museology

The need for training young men to function intelligently and scientifically in a museum is felt very greatly. A first-rate museum with galleries often being set up for one purpose or the other is the best training ground. Practical training is more important than anything in a museum set-up. With a view to make this possible for the benefit of students who would take to museum service as a career, museology courses have been started in Calcutta and Baroda Universities. Their comprehensive syllabus shows an elaborate study and practical work in close collaboration with Museum—fortunately large museums exist in both the places for providing practical training—and the University provides a diploma in museology for those who complete the course successfully. There is such a dearth of young and competent scholars in this field that this move is indeed a welcome one. The real training, however, starts in a museum with the young scholar taking up his place in an institution where the galleries are being set up and other practical work of acquisition, registration, care and preservation, study, research and dessimination of knowledge orally and by publications go on apace, cumulatively furthering the purpose of the museum.

Association of Museum Men

The Museums Association of India, where many of the important museums of India come together, is a forum where all the colleagues in the profession discuss at least once a year their problems in seminar and write in a bulletin issued by it. The bulletin has technical and other professional notes adding greatly to its interest and helpfulness.

Collaboration with World Bodies

For the past four years the ICOM in India through its National Committee under the presidency of Dr. T. N. Ramachandran and the advisorship of Dr. Grace Morley has actively collaborated with the ICOM centre at Pasis and the other National Committees of the world; and both at the Triennial Conference at Leyden in the Netherlands in 1962 and at New York in 1965, India has been strongly represented numerically. Some of the museums of India are already supplying the documentation centre of ICOM in Paris with the publications and up-to-date notes on their activities, and it is hoped that more museums in India would do this and help India to be internationally better understood. The request from ICOM on behalf of the FAO and UNESCO for an international campaign of Freedom from Hunger through exhibitions in museums has been splendidly responded to all over the world and equally so in India, which was well appreciated. Recently the appeal of the UNESCO for an exhibition of monuments all over the world to save them from danger had a splended response in India also and a number of important museums all over the country arranged special exhibitions through photo enlargements supplied to them by the Archaeological Survey. The activity of museums in the sphere of hanging and temporary exhibitions is indeed great and receiving special attention.

Problem of Reserve Collections

The visitor to the National Museum can easily visualize how the problems of reserve collections is also being tackled in museums today in India or at least has to be tackled ideally. It is visual storage in a part of gallery which is the study collection. It is arranged rather closely but very intelligently to be easily tackled for study. It is crowded as it is not intended for presentation as in a gallery in the manner as seen almost in an adjacent case in the exhibition area. The study collection is not a heap of jumbled-up objects as in the past. It is scientifically and intelligently arranged though closely in cases in the study portion behind the regular exhibition gallery.

A healthy Sign

Problems of study and research have been greatly engaging scholars in museums who are more and more coming together to discuss and exchange views both within the country and outside. The attention of scholars from all over the world is increasingly focussed on Indian material and to a certain extent Indian scholars are also getting acquainted with both Indian and other material in other parts of the world. This is a healthy sign and the museums in India as they are progressing in the practical side of presentation and the scholastic side of study and research and the social side of public relations and educational work are fulfilling increasingly their role as institutions of aesthetic appeals and educational purpose.

K. D. Bajpai

Cunningham's Pioneering Work

Archaeology has assumed considerable significance in the present context of scientific studies in this country. More than a hundred years ago when Alexander Cunningham, in his capacity as the first Archaeological Surveyor in India, conducted explorations in northern India, he was simply amazed to find almost every region scattered with ancient monuments and relics. Cunningham's was the first pioneer work in the field of archaeology. He collected various types of antiquities and preserved them carefully. The Archaeological Section of the Indian Museum at Calcutta and thereafter several other museums owe much of their early collections to the indefatigable endeavours of Cunningham. A good many antiquities, some being of unusual historical interest, were rescued by Cunningham and his zealous assistants from oblivion.

Some years ago a distinguished visitor from abroad remarked that the entire Indian sub-continent was like an open museum of archaeology. The large number of monuments in the form of stupas, viharas, temples, mosques and mausoleums, preserved to this day, are indeed an eloquent testimony to confirm the above statement.

Archaeology—A Door to our Ancient Past

The old relics, including stone sculptures, terracottas, metal statues, carved architectural pieces, inscriptions, coins and seals, have been preserved in various museums of the country and in the private collections. Due to the constant efforts of the Archaeological Survey of India, the State Archaeological Departments and Research Institutes, including several Universities, excavations have been conducted at various archaeological sites throughout the country. These excavations have yielded archaeological material, rich both in quantity and quality. Some of this material has been adequately studied, as a result of which much light has been thrown on various facets of our ancient history and culture.

Major Archaeological Museums

The importance of proper preservation of this valuable material cannot be over-emphasised. The Union Government have taken care to construct suitable archaeological museums at important sites of excavations. Mention may be made of the museums at Sarnath, Nalanda, Sanchi, Amaravati and Nagarjunakonda, to mention only a few. The Indian Museum, Calcutta and the National Museum, New Delhi are regarded as having very valuable archaeological collections exhibited therein. The State Governments have not lagged behind in this direction. The State museums at Baroda, Jaipur, Lucknow, Mathura, Patna, Gwalior, Nagpur, Hyderabad and Madras may be mentioned as some of the first-rate museums maintained by various States. The Bharat Kala Bhavan, Varanasi, the Prince of Wales Museum, Bombay and the Municipal Museum, Allahabad also rank very high in so far as their collection and display are concerned.

The archaeological material housed in the museums is of a rich and varied nature. It includes stone sculptures, inscriptions, terracottas, bronzes, coins, seals and sealings, pottery, ivories and various minor antiquities. Most of the museums have published catalogues and guide-books pertaining to their archaeological exhibits. These publications, no doubt, form an essential feature of the museum activities. Scholars and general public require authentic details of various types of antiquities preserved in our museums. Some of the museums have brought useful sets of picture postcards and brochures.

Excavations by Universities

Several Universities in the recent past have established archaeological museums of their own. Some of these museums have now grown into full-fledged institutions. The Bharat Kala Bhawan, maintained by the Banaras Hindu University and the Asutosh Museum of the Calcutta University may be mentioned in this connection. The Universities, such as of Allahabad, Baroda, Sagar, Patna and Poona, have been conducting excavations and explorations at various ancient sites. As a result of these excavations, archaeological material of varied nature, ranging from the early Stone-age to about 1800 A.D., has come to light. This material has been carefully preserved in the museums maintained by the respective Universities. These and a few other Universities have also made necessary arrangements for imparting training in field-archaeology to students.

The Future of Archaeological Museums

The museums of archaeology in the country are required to play a much more useful role in future, than they have been doing so far. The preservation side, in a large number of our museums, is not looked at satisfactorily. The adequate exhibition of various categories of objects and their proper publication is another desideratum. The building, the equipment and a trained staff are essential parts of a full-fledged museum service. The future of our archaeological museums looks bright in view of the increasing interest by the government and the people being shown towards them.

S. C. Kala

Landmark in the History of Museums

India is a country, rich in heritage and monuments. The latter reflects the nation's aesthetic ideals, artistry and superb imaginative flights. The builders, draftsmen and artists of ancient India were great in every respect. They wielded perfect control over their chisel, brush, paint and other material. The thought of collection, preservation and exhibition of the country's abundant cultural heritage, has rightly become the concern of every educated person in India. The foundations of a museum in India were laid as early as 1814, when the Asiatic Society of Bengal established a museum at Calcutta to house its valuable collection of antiquities and other objects. Second to follow was the Government Museum, Madras, which was started in 1851. At the time of the great Indian mutiny there were about a dozen museums in different parts of the country. During the Viceroyality of Lord Curzon (1899—1907) the museum movement received a great fillip. A number of sites and archaeological museums were established during this period. In recent times a good number of museums other than archaeological have come up in different States. The greatest land-mark in the history of museums in India is the establishment in 1949 of the National Museum at New Delhi.

Stirring in Museum Activity

The new political set up as it emerged from the transfer of power to the Indian hands ushered in a new era in the history of museum movement in the country. In the past, museums served as mere record houses for historians and research scholars. The concept of museum as the community centres of intellectual and artistic value was totally an unknown factor at that time The National Museum at New Delhi has developed tremendously under the directorship of Dr. (Mrs.) Grace Morley. Her devotion, as well as mature and varied experience has been of immense

value to the museologists in this country. On the recommendation of the Central Advisory Board of Museums financial aid has been given to several Indian museums. Symposia, camps, seminars and exhibitions relating to the museums have almost become annual features. These occasional fraternal gatherings and intimate discussions have proved very useful to the people in the museum profession. There is definitely a better sense of planning and preparation in the museum field now. A new outlook and a new vision has made them realise that the museums have to perform a significant social function in the community.

The Need for Assessment

These happy trends of the post-independence period are indeed most welcome. Judging, however, from Western angles our museums still fall far short of standards. It is high time that we take stock of all that has been done in the field of museums during the past ten years. This will give us a fair idea of our achievements and failures. In principle every experiment should halt at one point to assess the results and also to find out the reasons which hamper the conduct of smooth research work. How far the financial aid given by the Central and State Governments, the experience and training received by Indian Museum personnel in the West and the chain symposia and seminars organised in the country, have contributed to the sound planning of museums in India, are questions which need close examination and study.

Without reservation it should be admitted that museum planning in India should be similar to the one adopted for under-developed countries. According to the latest statistics there has been a mere rise of 24 per cent in the literacy output of the country during the past ten years. Our museum problems have become more intricate because of the country's percentage of illiteracy. How best such people could be trained in the visual appreciation of museum exhibits? How could they be made conscious of the fact that museums were national assets, and necessary adjuncts for infusing a sense of national unity? A long term plan of museum education has to be necessarily drawn for the attainment of such ideas.

Classification is a Misnomer

India is a land of varied geographical and cultural patterns. A uniform policy in such a complex set up is not likely to succeed much. Plans for Indian museums have to be evolved with care and caution. The Central Advisory Board for Museums has placed the museums into three categories—National, State and Regional. A glance at the present working of the museums in India will however, show that they have not followed the patterns indicated by the Central Advisory Board. The National Museum, being a new institution, however, has developed on national lines. The Archaeological Museum at Mathura, remains a museum of Braj culture as it was conceived with this very idea by the State Government. Normally there could be only one national Museum in the country but there are Museums like the Bharat Kala Bhawan at Varanasi and Prince of Wales Museum at Bombay which due to their unique collec-

tions claim the status of a National Museum. Then there is another class of Museum like the Indian Museum at Calcutta and the Allahabad Museum, which have appreciable number of exhibits of national importance and naturally they claim a higher status than a state or a regional museum.

The classification suggested by the Central Advisory Board cannot be accepted by the museums of India because the existing collections, which are complex and enormous in many cases, were built up without conceiving any set plan. The State museums are under the control of State Governments. Others are run by Trustees, local bodies and private agencies. These controlling authorities are always keen to widen the scope of their institutions. They acquire exhibits which have no bearing at all either on the State or the Region. The Archaeological Museum at Mathura is a fine example of a regional type of museum, but there is hardly any museum in the country which is not obsessed with the acquisition of Mathura sculptures, thanks to the Indian stone cutters who were so prolific in their output and excellence!

Status Quo—Best Solution

In the background of such tendencies it is advisable not to disturb the pattern of the existing museums and also the local sentiment which has been largely responsible for their growth and development in the past. But no sections concentrating on the State or Regional items can certainly be set up without disturbing the general scheme of the existing museums. It should be left for the time being to the choice of various controlling agencies to call their Museums State, Regional or with any other such appellations.

Modernizing Museum Buildings

During the past and present plan programmes the Central Government released non-recurring grants to several museums for the purchase of equipment and extension of their buildings. New wings with modern museum building plans have been added to the Bharat Kala Bhawan, Varanasi, Allahabad Museum and Archaeological Museum at Mathura. Buildings which were designed on old patterns could not be discarded altogether. But the Museum experts have renovated most of the galleries in these museums. In this direction the work done at the Indian Museum Calcutta and the Prince of Wales Museum, Bombay, is laudable. Those who are acquainted with the Scandanavian Museums very well know how the museologists of that country have converted old churches and antiquated buildings into spacious and well lighted galleries.

Adequate funds are necessary for sound planning. We expected increased allocations for the museums during the fourth five-year plan but the aggressions of China and Pakistan have seriously affected our future schemes. Museum men should not feel depressed over the cuts on their finances. They can utilise the interim period in preparing or revising the catalogues and the monographs on important exhibits in their collections. These works do not require much financial help.

The main Drawback

The main drawback of all the underdeveloped countries is the shortage of trained museum personnel. In this respect the museums of India present a dismal picture. There are museums where only a Curator and a Clerk are employed. Technical staff like preparators, photographers, chemists, markmen etc. are absent even in the premier museums of the country. Pay scales are so poor that no talented person is attracted to the museum profession. Even a keen and enterprising museum man cannot put his heart to work seriously due to the carking cares which are ever present in his mind. Besides technical work, museum administration has also become a highly technical field. If Museum service is to be standardized we shall have to revise the pay scales and also the schedule of posts. In the various meetings and seminars these subjects have been discussed threadbare, but no tangible results are yet in sight. It may be mentioned here that the University Grants Commission have taken a very bold step in revising the pay scales of the University teachers. In spite of the museums being run by different agencies it should be possible to adopt uniform pay scales. It should be made a condition before any grants are released. Those agencies which have lean resources can be given additional grants for meeting the pay of the staff.

Priority for Preservation

A Museum may have a fine building, modern show-cases and rare collections, but it would remain a dull and uninspired institution if there is no proper staff to handle its affairs. India has rigours of extreme climate which poses a great danger to the museum objects and paintings. Top priority should therefore be given to the preservation.

The museums are repositories of our great culture. After centuries of neglect the objects find a home where museum men are supposed to tender them a pious care. It is the responsibility and duty of every museum man to safeguard the national heritage against destructive agencies. But this is possible only when there are chemists attached to all Museums.

Lack of Staff and Facilities

Of late a good deal of emphasis has been laid on the importance of museum technique and service programmes. Deliberations during the course of meetings connected with museums, have also covered the technical aspects of various types of institutions. Participants and museum men who attend the meetings naturally profit in one way or the other. But they are not in a position to put the acquired knowledge into use due to lack of staff and facilities. These two essentials should be attended to urgently by the controlling authorities of the museums and the Central Government should also pay due attention to these factors while formulating its scheme for improvement of museums.

There is no dearth of talent, enthusiasm and exhibits in this country. Given adequate pay scales, technical staff and other facilities, the Indian museum personnel are capable of handling their charge with great care and efficiency.

Ajit Mookerjee

The museum movement in the West although of recent origin, has made rapid strides lately. As instruments of visual education museums in America and Europe have come to occupy the foremost place in public life. They have been integrated in the very educational system of the countries. Different categories of museums have been devised to serve varying needs and purposes. State patronage and enthusiastic public response are at the root of the phenomenal growth of museums and development of their multifarious activities.

It is high time that museums in India should cease to be treated as mere "storehouses of the dead" or "curio-palaces"; they should be improved, over-hauled and planned in a manner so that they may properly discharge their vital functions as true repositories of knowledge and beauty.

Rich Resources for Popular Education

Indian Archaeology has already completed a century of its existence. But unfortunately there are only about 175 museums in this sub-continent, and our archaeological galleries, far from serving their purposes, have remained a standing insult to one of the greatest phases of art the world has ever seen. Resources which are equal in richness and variety to those of any other country are to be found here, and yet they

are not used as they could and should be used in the cause of popular education.

A few observations in the history of museums in India will throw some light on the present condition and may perhaps suggest in what directions improvement should be made.

Development of Site Museums

As a result of excavation works carried out by the Archaeological Survey of India, many of our provincial and site museums came into existence.

But unfortunately they were organised without any proper thought and not a few developed as godowns of heaps of antiquities without requisite ideas about planning and preservation. With certain important exceptions, they failed to serve the needs either of research or of popular education. In some of them articles of potential value were left in miserable condition and in danger of falling into decay. Besides these, scarcely any care was taken by the authorities concerned to have the objects grouped and arranged scientifically and to display them in suitable pedest- and show-cases with proper labelling.

Guides and Guide Books

To assist the visitor to an intelligent comprehension of what he sees, museum authorities did not generally provide popular guide books especially in Indian languages and lectures by trained guides. Throughout the year a crowed of visitors can always be found wandering from one gallery to another without comprehending the significance of the objects.

Naturally to many of the visitors the archaeological galleries of the public museums appear uninteresting and boring. A few learned folk might gather there to look at the objects with discerning eyes, some of the general public might go there to gaze at the memorials of a long forgotten past, and to wonder at the strange things they see or stare at the mummies, but to the majority, the whole thing is as dry as the mummies themselves.

It should be noted that there was no educational purpose in view when our museum collections were assembled; their educational function, though, was natural and obvious one.

A Unique Report on Indian Museums

The line of improvement of Indian museums has been elaborately discussed in the Report on the Museums of India by Markham and Hargreaves presented during 1936. It is worth noticing the conclusions of this Report in which suggestions have been made that the Government of India, State Governments, Municipalities and Societies, and Curators might take immediate action on the following lines:

(i) *By the Government of India,*

a. The provision of greater financial assistance for better museums.

b. The appointment of an Inspector General of Museums with European experience, for a period of at least three years who would train a qualified Indian offier to succeed him. The latter's

training in India should be supplemented by an extensive course of study abroad.

c. The granting of scholarships for the training of curators and the provision of opportunities and facilities for their training.

d. The provision of a new constitution for the Indian Museums to allow the appointment of a full-time keeper for each section.

e. The revival of the Standing Committee on Museums and Museum Conferences and the provisions of funds to meet the cost of the Committee, travelling allowances involved and the necessary printing.

(ii) *By State Governments, Municipalities and Societies.*

a. The provision of more funds for good museums and the closing of useless museums.

b. The appointment of fully qualified and active curators at adequate salary scales.

c. The granting of scholarships for the training of curators and the granting of facilities for their training.

d. The strengthening in every way of the connection between museums and education.

e. The appointment of Museum Committees of influential persons interested in Museums, having a knowledge of museology and prepared to give time to attending meetings and paying visits to the museum.

f. Ensuing that the collections are catalogued and the exhibits carefully preserved and labelled, and that handbooks, catalogues and guides to the collections are prepared by the curator or other qualified persons and sold at the lowest possible price to visitors.

g. The consideration of the question whether public museums should be set up in all towns having a population of over 100,000 persons.

(iii) *By Curators, especially those in the smaller museums*

a. The scope and purpose of the museum should be decided and definite rooms allocated to definite subjects.

b. The purpose of each object should be kept in view and the label given accordingly. Nothing should be exhibited without the intelligent label.

c. Overcrowding should be avoided and all labels and exhibits should be clean.

d. Rudiment specimens should be put into store or reserve.

e. Where possible, specimens and labels should be supplemented by explanatory photography or pictures.

f. All textiles and other perishable specimens should not only be put under glass but in air-tight cases, and adequate precautions taken against dust, pests and sunshine.

g. A quarterly inspection of all perishable specimens for any signs of pests, cracking or bleaching should be done.

h. Very valuable specimens should be kept under lock and key, or continually watched.

i. The museum and curator should be kept up-to-date.

j. The Committee should be made to take interest in the Museum and stimulate co-operation.

k. The most noteworthy objects should be made more conspicuous and should be mentioned in a cheap general guide.

l. All exhibits should be so exhibited that they can be conveniently seen without stooping or straining the eyes.

m. In all large museums and galleries clear plans should be placed conspicuously in the entrance hall and at all central and pivot points, indicating quite clearly where the visitor is standing and how he is to find his way to other parts of the building.

Museum Committee

Besides these recommendations, further suggestions may be offered. The Museum Committee [as mentioned in the paragraph (ii) (e) of the Report] should be responsible for practical advice and scientific guidance with regard to the various aspects of the preservation of works of art, from laboratory research to problems relating to architecture, including the organisation and equipment of exhibition galleries. This Committee will also fulfil two other essential functions: the study of the documentary materials in order to reply to the questions asked, and the collection of information on the practical achievements. When the replies are of general importance or of interest to museographical circles, they should be monographed.

Besides these museographical studies, the Committee should publish at regular intervals, detailed descriptions of certain collections and museums. These investigations will be undertaken, firstly, to inform the researchers of the documentary resources of museums in various parts, and acquaint curators with the work done by their colleagues; secondly, to encourage these institutions by giving a certain publicity to their work.

As regards the scientific examination of works of art and the restoration of various objects, the Committee should enquire into the processes at present employed elsewhere, and which are constantly being improved by modern science.

Protection in War Times

The Committee should also deal with the problems relating to the protection of works of art in war times. The International Museums Office, as a result of its first general study on the protection of artistic treasures in Spain, is in possession of abundant and detailed documents in which these measures of protection were organised. These documents supply information on the work that had been done for this purpose in various parts of Spain during the Civil War and on the measure of protecting buildings containing works of art. The scientific methods used for the packing of museum objects can also be known through these documents. In

all these cases, the processes and methods recommended by the Museums Office have been very largely adopted. It was also at its request that a systematic record was kept of the vibration caused by bombardment, or of the action of gas from incendiary bombs. A Theoretical study has also been made on the protection of museums against air-raids. This study is based on the most recent data available on the resistance of materials and provides for the salvage of objects.

Conservation and Preservation

An article on the "Care of Works of Art in War-time" by Mr. Rawlings, of the British Museum, which appeared in "Nature" on 25th July, 1942 should be read by all who have been entrusted with public art collections. According to Mr. Rawlings "the programme of evacuation and war-time storage of valuables and perishable objects is one of avoiding the growth of mould or mildew. A relative humidity so low as 68 per cent has been found to permit mould growth especially at temperature around 70°F and to show that raising the temperature is not in itself the security, if the relative humidity remains excessive. Good ventilation, or at least adequate air-movement, is a safeguard. Another matter concerns lighting. Some illumination is desirable as a check upon mould growth itself. In addition, for pictures less than about fifty years old, there is a tendency for the medium to turn yellow, especially if of a 'fat' nature. This process is favoured by darkness. For older paintings, oxidation is probably complete, and no colour change need be expected as the result of storage away from light, so far as the medium is concerned. Water colours and miniatures should always be stored away from light. Generally, there can scarcely be hard and fast rules, except perhaps to recollect that flooding, exposure to excessive relative humidity, attacks of mildew and no less inadequate or rough transport may bring about damage amounting almost to disaster (p. 114)."

The above methods and measures for the improvement and utilisation of museums should engage the interest and attention of the public as well as scholars. Without such active interest and co-operation museum collections gradually pass into the limbo of things forgotten museum visits becoming merely mechanical and half-hearted.

We feel inclined to believe that the word *Jadu-Ghar* or *Ajaib-Ghar* which means "Magic House" is perhaps to not a small extent responsible for the present state of museums in India. The terms so used to signify these institutions can but suggest a resting house for the dead and the fossil which have rather trespassed into the present from long-forgotten past, making the whole atmosphere of their abode a source of depression, if not of consternation.

One should not forget that proper interpretation and utilisation of the museums in modern times are important stepping stones towards the progress of civilization for which we are all striving together.

Satya Prakash

'Museum' in its original sense, meant a spot dedicated to Muses—the Nine Muses being the mere shadowy figures of Greek Mythology. The museum was, thus, originally a place for study and discussion in literature and philosophy. The adaptation of its name to modern usage was a feature of the European Renaissance. It is now understood to be a collection of objects, interesting and instructive to scholars and laymen alike and arranged and displayed in accordance with what is called the 'scientific method' of education and with it a sense of continuity with our own past, with well planned presentation of its exhibits, the museum can easily communicate the patterns and purposes of earlier civilizations, and the stages by which man has evolved. The present century has witnessed the development of the trend of integrating the museums with our educational system. The full realisation of the museum's

value in the education of both adults and children has been achieved through the educational programmes in most of the civilized countries of the world.

An Institution of Visual Education

A museum is symbolic of cultural awakening just as schools and libraries are of educational. If properly supported and skilfully arranged, a museum can prove to be a powerful instrument of visual education. It is essentially the museum which preserves the tangible evidence of man's history, of his creativeness and of the physical aspects of the world he inhabits. A museum, to fulfil its functions perfectly well as an institution of visual education has, first of all, to collect and preserve objects. This is to be done with discrimination and purpose. Each object is to be identified, recorded, placed in its proper historical and natural sequence.

But a museum that merely collects and preserves would be a mere store-house and so the second responsibility devolving upon a museum is that of making the collections available for the pleasure and enlightenment of the visitors, whose curiosity brings them into the museum. The worth of an object, is measured not only by its beauty and variety but also by the proportion of its use.

Man's right to knowledge and free use thereof is a key to the success of an enlightened democracy. The museum being an agency of education, tends to promote knowledge and its free use. Museums are not merely repositories. They exist to teach, to add something to the knowledge and enjoyment of everyone, who visits them. The teaching process is strengthened and enlarged by a variety of exhibitions in the museum rather than by a permanent static display.

Functions and Activities

Live museums are, necessarily, proper and helpful institutions to the community, which establishes and maintains them. These should have such materials, as a community can use to good advantage in formal and informal training through the eye. Through this training every member of every community gains in some measure every working moment of his life. The museum aims only to supplement this instruction through its objects. Thus the museum should arrange its shows in such a way that it may:

(a) entertain and be ready to try to interest and instruct such as may have the wish and the time to visit casually the institution's headquarters.

(b) entertain and more definitely and generally instruct in classes and conduct groups by means of labels, leaflets, handbooks, talks and illustrated lectures, to such adults as may be induced to come to see special exhibits also at the museum's headquarters.

(c) entertain, interest and still more definitely instruct children, who may be sent to the museum's headquarters from schools on stated occasions. The talks, and the reading expounding the objects, should be closely related to school-work and to the age and stage of mental development of each group that comes.

(d) prepare for school single objects and groups of objects with labels, leaflets, lantern slides and lend these to schools, as the school authorities may designate.

(e) place in schools, single objects, large and small collections of objects, fully labelled and accompanied by pictures, leaflets and pamphlets.

(f) place convenient and easily accessible rooms like stores on business streets and in special rooms with separate entrances in school buildings, single objects and small well-rounded collections in art, science, industry, etc.

(g)d iscover collectors and specialists and experts in the community and secure their cooperation in addition to the Museum's collections, in helping to identify, describe and prepare labels in order to interpret exhibits on proper lines.

(h) lend to individuals, groups and societies for any proper use and for any seasonable length of time any of the museum's replicas of objects.

(i) prepare and display at the headquarters and at branches in schools carefully selected objects, which are products of the community's activities in field, factory and workshop. These will be local industry exhibits.

(j) keep the museum and its activities continually before the community in the daily press, publish and distribute as many leaflets, posters, etc. as are necessary for the members of the community to educate them.

(k) inter-relate the activities of the museum with all the resources of the public library.

All the above activities should help the museum to stand side by side with the library and the laboratory, as a part of the teaching equipment of the college and university and in great cities to cooperate with the public library as one of the principal agencies for the enlightenment of the people.

All museums have one purpose in common and that is to make people aware of themselves and their environment. What a golden opportunity the museum has in providing a real adventure in awareness by accepting the challenge to pioneer in new approaches and methods in presenting their exhibits. Even old familiar objects take on new meaning and significance when presented in a dramatic fashion.

Utilization of the Material

Basically, although there are many different kinds of museums, the primary problem in any museum is that of the organisation and utilisation of its material content. Since that which distinguishes a museum from any other social institution such as the school, the church, the temple, the mosque, the prison or the theatre, is the possession and use of its materials, it follows that the key to the realisation of any objectives in museum education lies within those contents. To the extent and in the proportion the material contents of the museum are exploited to education needs, to that extent and in that proportion does a museum prosper.

The content of the museum has, in the large, been collected, studied and arranged by people, who are primarily interested in the materials themselves. They are the explorers, who have found more objects of art or archaeology, or the natural scientists who have discovered more about birds or bees, or flowers; they are the anthropologists, who have found new evidences of ancient practices or the antiquarians, who have discovered new evidences of old materials. These professional people constitute a comparatively large group in any museum and to their indefatigable industry is due the completeness and character of whatever materials, the museum may have. It is upon this scientific, cultural, or academic ground work that museum education depends; for without it any education would be dross. These materials are the timelessly valuable proceeds of man's industry in the discovery, annotation and arrangement of his natural heritage. They constitute the basis for the spring-board of social progress.

Education, however, must take these timeless materials and deal with them in timely fashion.

Multiple Functions and Problems

A museum faces four types of problems in education. Each of the four involves the museum and its clientele in different ways; but each in its own way is of importance to the ultimate value or the community success of the venture. Moreover, in proportion as each is given weight or support or position in the institutional scheme, it places its stamp on the entirely of the programme. The four problems are to serve the needs of the expert community, *i.e.* the professional workers of the museum and their colleagues—to supplement other community forms of education such as the schools and colleges, to interpret the museum content in terms of contemporary pyschological needs of people, and to provide worthy recreation and stimulating entertainment for all.

Closely connected with these problems of museum education are those of museum exhibition. These lie in similar categories to the problems of learning.

For experts on all levels, exhibition is taxonomic, synoptic, encyclopaedic, and so far as possible, complete, the character depending upon the form of material, whether art, natural science, anthropology, history, or what not. Such a need has little difficulty in satisfaction, requiring merely material, time, patience, space, and relative permanence, problems with which museums have struggled ever since they were first established.

Exhibition for supplementing curricula is variable, and any variation can be determined only by the curriculum, it is designed to meet. A community may have a single curriculum, but in some large cities, where educational systems are variable there may be every variation of persistence. These variation may be guided be a series of educational philosophies ranging from scholastic dogmatism on the one hand to doctrines of pragmatic individualism on the other. A museum in an area of a single curriculum may find it easy to adapt its materials to its schools, but in a variable age, the

museum must meet this variable need. It can do so only if in the development of its exhibits, it has before it at all times the basic principle that the meaning of an exhibit, like beauty, lies in the eyes of the beholder. It is not the builder who builds into the exhibit the meaning that the viewer sees; it is in the past experience of the viewer, in the purpose with which he meets the exhibit and in the attitude that he has towards it. These all taken together dictate what he sees, or how much, or with what kind of meaning.

'Exhibition to interpret current psychological needs rests upon the basic meaning of the museum materials in relation to current problems of living, and the emphasis on exhibition for this purpose must, therefore, lie primarily in the problems rather than within the material field. .

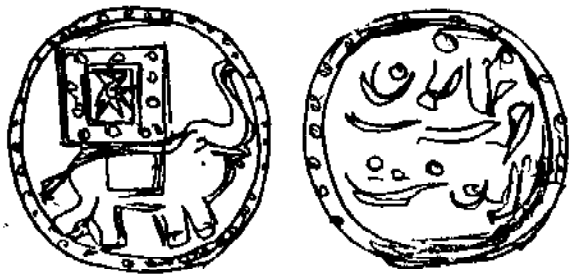
Recreation with thoughtful Activity

The problem of exhibition in providing worthy recreation and stimulating entertainment for all is not too difficult, but as a defined problem it has been neglected, recreation that requires thoughtful activity as a worthy entertainment and as an end in itself has a real place in living. The main directive needed is to remember that all exhibits are not equally interesting to all people. Too often, the builder of exhibits feels that interest is an attribute of the exhibit itself and is built into it, whereas it is merely a feeling in the viewer, which may draw or repel him. Every viewer sees each exhibit in his light rather than that of the builder.

Learning through Understanding

Thus, two forms of exhibition seem to emerge, one, that in which materials are arranged with relation to themselves, and second, that in which the contents is subordinated to an external idea. Both types must be used for educational purposes, and both types are necessary within the museums because neither, by itself, can serve all the exhibition and educational needs. Museums, large or small that confine all their exhibition programme to either form, thereby, restrict their activities and limit their influence. The timely reorganisations that can be developed in the second form bring about an almost endless series of educational consequences. Special exhibits, arranged in terms of ideas external to the materials such as 'Intelligence in Animal', 'Garments from Fiber and Fur to Wearer' and 'Birds in Poetry', are all examples of this second form, and are only samples in which learning can proceed through an understanding, where labels and teachers are almost unnecessary.

Education is, in short, the logical and constructive outcome of museum collecting, arranging and exhibiting. It honours the museums in its activity, and, in turn is honoured by the museums, since the richest fruits of each serve only to enhance those of the other.



A.K.Bhattacharyya

Museology—A New Discipline

The science of museums or museology is by all measures a product of comparatively recent thought. Collections of antique objects or of scientific materials accumulated as sheer hobby of an amateur may be museum of some connotation, but may not be a scientifically presented group of objects meant for researches in the techniques of presentation, classification, documentation, etc. That this is so, is proved specially with reference to the evidences available in India of the existence of such collections from remote ages which certainly cannot be described as a museum of any scientific importance. The science of museology is not only of recent origin but also is a science of subjective study. It is governed not by any inflexible law of nature or axioms, but by certain general principles within which actual achievements in museum arrangements, documentation, etc. are judged.

Museum Studies with Scientific Bias

During the last century scientific experiments on museum studies have helped in thoroughly re-orienting our ideas in this respect. While some of the most well-known and important museums of the world have been built upon personal collections of some amateur art-lover or scientific explorer, their presentation before the public have received the attention of more scientifically equipped people than before. In other words, more than the collections, how best they can be scientifically classified, documented and arranged is engaging the attention of modern museologists. Impact of this recent trend has also been felt in India, though comparatively later. Indian museums with their enormity of collection not only in art and archaeological fields but also in the field of natural sciences like geology, zoology, and in industrial economy, have also undergone rapid scientific reorientation in the matter of arrangements and documentation, not to speak of scientific investigation on their collections.

Emphasis on these aspects of museum studies has been made inevitable also by the tremendous progress that the different scientific departments have made in the matter of explorations, and excavations wherever applicable. The museums as the ultimate store-house and recipients, of these discovered materials have also responded in a very encouraging way.

Rotating Exhibitions

As a result of this dynamic impetus that museum movement in India has received in recent years, several methods have been suggested, and in a few cases, implemented in order to avoid perpetual storage on one side and bringing to the reach of the people all that is received in a museum on the other. The idea of rotating exhibitions in permanent galleries has been one of the very important introductions in this matter. The idea not to display all that a museum possesses is meant to solve this problem in a very smooth and imperceptible way. According to this, a few outstanding pieces in each group of objects under the different classes are selected at a time for presentation suitably, and then replaced by another similar group which again by a third one and so on, at convenient intervals. This solves the problem of space for display in the galleries. In fact, a museum grows in the reserve and storage space, and need not do so in the gallery space. This also very ably serves the purpose of keeping the museum galleries very much alive and attractive to the people who would visit the institution as often as the changes take place and not see it once for all, as was usual in the bygone days. This also keeps the museum personnel very busy in dismantling the old set of exhibits and fitting up the new set at regular intervals, and last though not the least, helps to preserve the specimens from the danger of indefinite exposure to light, temperature and other factors of wear and tear.

Visible Storage

Rotating exhibitions are not only done on the basis of the merit of exhibits in the matter of selection but also on thematic basis. In other words exhibitions

based on particular aspects revealed by the exhibits are arranged by rotation each with emphasis on particular aspects, so that by this promiscuous selection some objects definitely are relieved of the strain, while others get the chance of being put on show. For this, the devices for exhibition, the screens, the pedestals, the showcases etc. are designed in a more flexible way than before so that materials of varying sizes and character are set up in exhibition with the least involvement of cost and condition. This is in contrast to the practice hitherto adopted in older museums, of setting up the museum exhibits, *e.g.* a sculpture, a model etc., on masonry pedestals, or in inflexible dioramas etc. This is apparent by a visit to the older museums the world over and India claims no exception. Though here museum experts of today would sound a word of warning that while objects on view are saved from the effects of wear and tear, those in the reserve and in the storage should not be so conditioned as to keep them uncared for in neglect and oblivion. This brings us to the problem of storage arrangements which are no less important, according to modern trends, than display arrangements. Recent thinking in museology would advocate arrangements of museum objects in a condition of safe and visible storage. In other words, storage of all the materials that are not shown and exhibited in the galleries for the general public are to be made available equally to large sections of the society which go under scholars, and proper utilisation of the reserve material. They should be arranged in storage in such a way that they are also equally protected from the normal effects of wear and tear, and are also equally available in a classified manner and scientifically documented.

Labels—A Necessary Evil

In the matter of arrangements of galleries and documentation the one very important change in the outlook that modern museum thinking has brought about is with respect to labels and other literary aids that accompany the objects. While it is true that every object has to be labelled and documented properly even for a layman, it is considered as a very distracting element in the whole presentation complex where objects and objects alone should occupy the most conspicuous place and engage the unmitigated attention of an on-looker. Artistically as well as from the point of view of undictated study of the objects, presentation with as little accessory documents as possible is desired. Human mind should be left with that independence and freedom which alone help the objects to commune freely and most intimately with it. The impact with aesthetic and scholarly element inherent in every human being should be direct and unsullied. There should be no pre-judgement of the objects offered to the on-looker or the visiting scholar, along with the object itself. An object, in other words, should be able to tell its own story to the visitor rather than the label should dictate. Nevertheless, literary aids to exhibited objects are a necessary evil, which can hardly be denied completely.

Educational Services

Besides the literary aids, and as part of the larger educational projects for a

museum, schemes for positive and active educational services for the visiting public have received the attention of museum authorities here as elsewhere. These educational services may be general or may be directed to specific people visiting the museum. While children's programmes in museums including organised group visits from educational institutions or educational excursion teams from Services, delegations, and different technological and other institutions fall in the latter category, regular guide services publication of cheap and handy guide-books, picture post-cards, general aids by way of intelligible labels, maps, introductory statements and charts etc. are included in the general programmes of educational services. Apart from specially guided tours by select groups of students from schools, specially organised film-shows for them, are important aspects of children's programmes. In bigger museums like the Indian Museum at Calcutta special galleries for children with select specimens and projects under different categories of study are helpful arrangements in this direction. An extended form of classrooms, such galleries will provide better study facilities and the thrills of firsthand factual experience for the imaginative young mind with things of the remote past or of rare occurrence. In bigger museums where it is not possible to take the children round the tiresome long galleries, these have a special importance which can hardly be denied. What best suits them by way of educational, aesthetic and informative material within the framework of museum display will only be selected for such a gallery.

An important part of educational programmes in museums of today is a scheme for travelling and mobile exhibitions, where a select group from collections is taken round those corners of the country or to those sections of the society where people have rarely an opportunity to move out far. and seldom have chances of a visit to the larger collections in regular museums such as are located in the bigger cities.

To popularise museological studies and experiments, and what it stands for, specialised exhibitions are sometimes called for and are organised all the world over. In other words, subjects such as, museums in education, are a popular theme for illustrating the role of museums in the service of education. Indian museums, specially the larger city museums like the Indian Museum at Calcutta, have pioneered such projects in recent times with success.

Taking Museums to the People

Distance is a factor in India. More than lack of trained personnel, the inherent limitations of such ambitious projects stand in the way. These are frought, among others, with difficulties of safe and secure transport. While, however, these are being improved in a developing society, such as in India, a trained receptacle in a far away corner is the best guarantee in a project of this kind. The role of museums in educating the innocent mind can never be over-emphasised. In India today, their wide distribution will help not only the growth of well-equipped museums but in infusing that consciousness in the uninitiated community which go a long way in the dis-

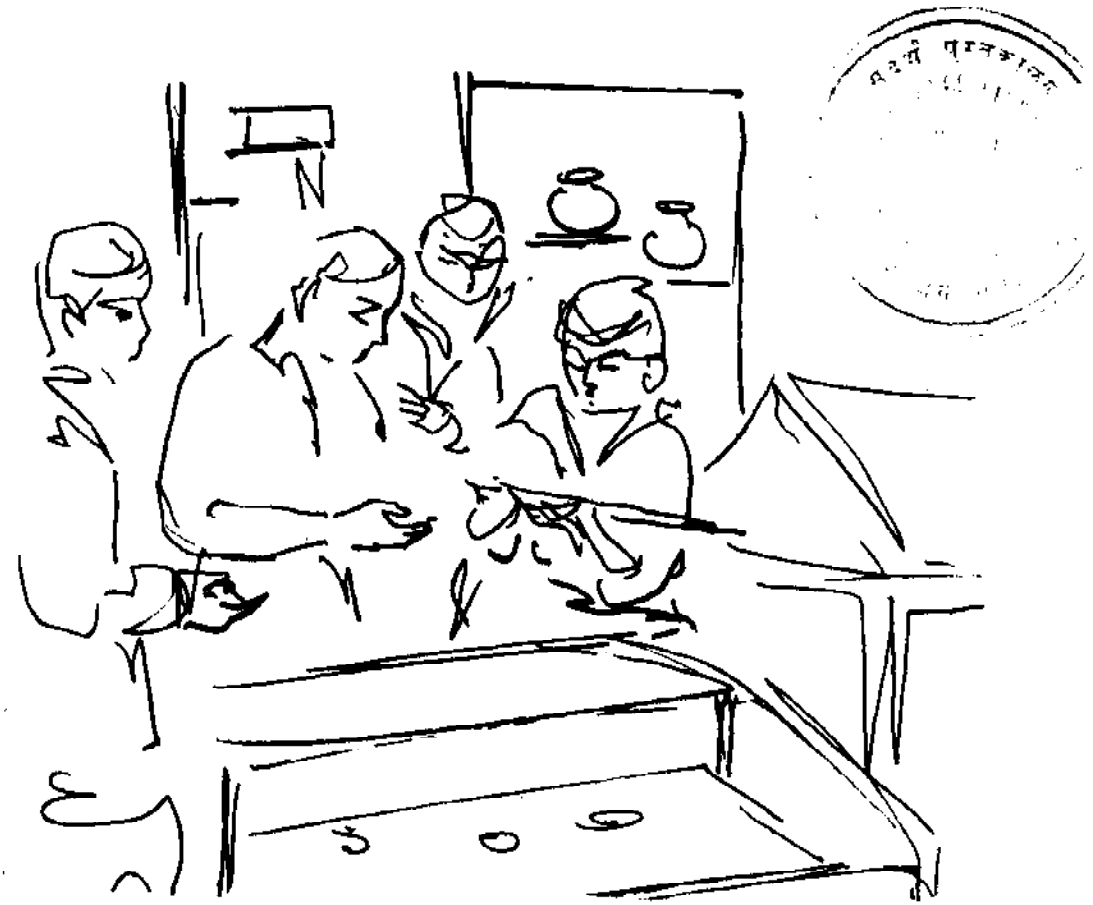
covery, preservation and study of the country's ancient vestiges.

Conservation

In recent years museums have developed within them self-contained units of preservation laboratories. Commensurate with the responsibility that a museum bears towards the growing treasures of the heritage it houses, the recent trends to bestow more attention than ever towards building up well-equipped laboratories peculiar for its own purpose are more than encouraging. It is heartening to note this trend in most museums of today. Based primarily on regional consideration the bigger museums in each of the major sections of this country have applied energetically to this aspect of museology. With the projected setting up of a fairly large preservation unit at the Indian Museum, Calcutta, this country will in the near future be able to face the challenge of nature in this field almost fairly and squarely. It can under no circumstances be denied that a museum big or small should have a laboratory of its own with peculiar problems and types of objects to deal with.

Publications

Museums have, further, very ably assumed another responsibility, *viz.* that of helping research by publishing materials in their charge, and thereby bringing them to the reach of the people. Museum collections no longer bear that personal ties which an individual collector of yesterday would have enforced. It is a part and parcel of the cultural life of the people concerned, and its activities are meant to stimulate, elevate and enliven the social structure to which it belongs. It is in the fitness of things, therefore, that the society is allowed to share the rich treasures of knowledge stored in the museums. This is best done by keeping the society informed of the various branches of knowledge illustrated by the collection, as also by making use of it through the publications issued by the museums. Preparation of catalogues and hand-books is, therefore, a primary responsibility of the museums.



Sachin Roy

In this rapid changing world we cannot afford to have our Museum as a place of storage, neither as a refined display of haphazard curios. The Museum today, we all agree, is a modern medium of imparting education and, thus, is a major factor in the active cultural development of our nation. Today, our primary work in a Museum is to interpret aspects of our cultural heritage through the study of objects displayed in such a manner that they become the centres of education to our

vast adult masses as well as to the children. This study is the only means for preservation, presentation and interpretation of objects representing our cultural heritage of the past, to benefit our present and future generations. For museums or collections of anthropology, natural history and of other scientific fields there can be a systematic planning of collection to facilitate proper study and informative exhibition. For archaeology, art and history the problem is more difficult: the museum has to use what has survived and is available for collection, and there may often be wide gaps. Ideally, of course, the same aims and methods apply.

In the case of the first category of museums, with a careful forethought and planning, systematic collections can be secured for a systematic exhibition. In order to fulfil the primary aim of a Museum, it is our responsibility to study the objects thoroughly. This study may be manifold but can broadly be divided into two stages:

(a) Study before acquiring an object.

(b) Study after acquiring an object.

Study before acquiring an Object

The curatorial staff is required to study the theme it likes to display much before it starts acquiring the object for the Museum. The result of such a study of the object as also the culture associated with it, will help the curatorial staff in a systematic planning of exhibitions as also in having an organised collection of the specimens. The whole purpose of acquiring the object for the Museum will be lost if those specimens are acquired without having a thorough knowledge of the history, provenance, etc. This important aspect of the study will be lost if museum authorities start accepting, at random, gifts of collections without proper planning and documentation in order to enrich their collection. Even worse is when Museums purchase articles only for the sake of collection without much consideration to the documentation necessary on each object. Secondly, an acquired object with wrong information, or no information, is almost useless in a Museum of any scientific and educative value. This way of acquiring objects for Museums not only creates problems for the authorities responsible for the display and study but also involves a serious problem of storage and space. A thorough study and a well planned scheme by the Curator, ahead of collection, simplifies much of his work, both during expedition (for collection of material) and after, for displaying. Thus, if he plans ahead his scheme of display, he simply collects the specimens to represent the different stages of culture he wants to display, with relevant information for the Museum, and starts with his work. Moreover, a collection of such a nature helps the curatorial staff to understand the life and culture of the people more closely, and to the point, so that he may not be handicapped in his later studies.

Study after acquiring an Object

The major work of the curatorial staff remains even after acquiring objects for the Museum in the methodical way described above. Before displaying those in the

gallery there remains a lot to study. The study under this category is the study to reveal the significance of the collection, in detail, regarding individual objects in relation to the society. This type of research on the object also helps the curator to finalise the method of displaying of the articles in the proper manner so that the main purpose of the collection may clearly be focussed. No presentation will be a success unless we can interpret it properly after a careful and close study of objects. Interpretation in this way ultimately helps to impart education through preparation of popular literature for visitors and informative material for the inquisitive mind of the children, to broaden and enrich their lives. This study also helps in the preparation of the catalogues and guide books focussing on new discoveries. Through this type of study in the Museum the Curators help in the growth of knowledge in their specialised field which leads to pioneering publication of original research.

In order to fulfil the demand for this type of study we must have top-ranking specialists in the museums on different aspects of each subject. Curators, like university professors, should be allowed facilities of library and laboratories and should be equated with the university's professors and readers. Once curators are recognised at the university level and are allowed sufficient time and opportunity to carry on the research in relation to the objects collected by them from different expeditions for the Museum it is not difficult to foresee a general improvement in all spheres of Museum life. The Museum should also have enough facilities for university students to come and carry on their research under the guidance of these scholar-curators. Eminent museologists like Dr. Moti Chandra have already stressed the need of such study in a Museum and also pointed out the difficulties of carrying on such research in our Museums. Even today the difficulties for research in the Museums in India are many but, gradually, opportunities are coming in, both for recruiting specialised Museum personnel and for arranging facilities for their work. The fulfilment of the above two points only will not suffice unless sufficient time is allotted to these specially qualified curators for carrying out research on different aspects of the Museum objects the whole project will be a failure and we will lose the benefit of their talents. The larger museums in this country should take the initiative and lead, to plan their research programme and should provide facilities such as libraries, laboratories and enough of time for research workers, both for the curatorial staff and for outside workers from the university or other Museums. The problem of appointing suitable research workers is inevitable but could be overcome to a great extent when the curatorial staff are equated, both by pay and facilities, with the university staff.

V. L. Devkar

Museum Training in India

Dr. P. S. Rowson, the UNESCO Expert in Museology, who was invited by the University Grants Commission in 1964 to make suggestions for the development of Museums and Museology in India, made a careful study of the two Museology centres at Baroda and Calcutta. He was good enough to send me a copy of his report which is remarkable for the frankness of his opinion and a constructive approach to the problems of Museums and Museology in India.

Dr. Rowson has stated in his report that "India is to-day leading the world in the University training of Museology students. The Post-graduate University Course, first at Baroda and then at Calcutta has set a notable precedent, which so far, has been

followed only in one University in the U.S.A."

Courses in Museology

As I was responsible for starting the course of Museology in India, I thought that I should write in this special number of Cultural Forum, a brief review on the subject and make a reference to some urgent problems of the Museology students. Perhaps, it may be of some interest to mention here, that the word Museology was practically unknown in India before 1952. It is, therefore, a matter of gratification for the University Grants Commission and the authorities of the M. S. University of Baroda and the University of Calcutta that under their sympathetic care and financial support, the subject of Museology developed rapidly within a short period in India so as to lead the world. So good and progressive are these courses, that the Leicester University in Great Britain is starting such a course from this year and Dr. Rowson himself is planning to start a similar course in the University of Durham, to which he belongs.

Museology and Archaeology

Before 1952, the conditions were such, that Archaeology dominated the Museum field and if a person possessed the degree in Ancient History and had some knowledge of Numismatics, Epigraphy or Prehistory he could get a job in any museum of India. In other words, the whole Indian museums service was over-concerned with Archaeology. This led to the neglect of Art and scientific collections as well as in the methods of display and conservation.

Specialized knowledge or Practical Training

However, with the development of a two years' Post-graduate Museology course in 1952—the first of its kind in India—by the M. S. University of Baroda, with the assistance of the Museum and Picture Gallery, Baroda, it was first realised by the Government of India and later by the University Grants Commission that Museology is a scientific subject and what is really required for the reorganisation and development for the Indian museums is not so much of specialised knowledge in a particular subject but a thorough training in the various branches of Museology. It is obvious that there is still ten years' hard work for technically trained Curators to reorganise their museums before they could be of any educational use to the research scholars and students. These considerations, led the Government of India to form a separate Advisory Board of Museums as distinct from the Central Advisory Board of Archaeology. The University Grants Commission who were watching the development and success of the course of training in museology in the Baroda University for a period of 5 years announced financial assistance on 100 per cent basis to any Indian University which has the necessary staff and facilities to start a Post-graduate Museology course in collaboration with a big museum. As a result, the University of Calcutta also started two years' Post-graduate Museology Course with the collaboration of the Asutosh Museum, Calcutta, in the year 1958.

These two leading Universities of India admit suitable students who possess a

degree in subjects covered by the collections of the museums, preference being given to M.A. and M.Sc. students. They teach all aspects of museum Administration and museum Technique and make every effort to improve their standards of teaching, training and research with the sole object of supplying properly trained candidates to meet the urgent need of the Indian Museums.

Apathy for Diploma-holders

It is, however, seen that in spite of the high standard of Museology in India and its appreciation by several foreign experts the authorities in the Government and the leaders of our museums profession do not make any efforts to see that the available trainees are fully admitted to the museum services for the proper development of Indian museums. There are only a few State Governments who have made necessary changes in their recruitment rules to offer employment to the Diploma holders in Museology. But what is most surprising is that some of our leading museums which conduct Inservice Training Courses in the name of Museology and which assist the two Museology centres at Baroda and Calcutta in their programme of lectures and practical training to the Post-graduate students, do not give any preference to the Diploma holders in Museology while filling in vacant posts under their administrative control. The two exceptions are the Museum & Picture Gallery, Baroda and the Salar Jung Museum, Hyderabad which have not only revised their recruitment rules, but taken definite action to give employment to the Diploma holders in Museology. In the circumstances it is not proper to give preference to M.A. and M.Sc. candidates in several museums of India, when suitable candidates with additional training in Museology are available.

The museum authorities have yet to recognise the role of trained Curators for the upkeep and development of Museums on modern lines. But today the advertisements for Museum posts continue to mention of a degree in Archaeology, Sanskrit, Pali, Prakrit, Persian, Arabic and several other things including excavations but there is not even the grace of a reference to the course of Museology which is a subject recognised for Post-graduate study by the University and which is directly connected with museum work. It is taught for a period of full two years like any other Post-graduate course of the University leading to the degree of M.A. and M.Sc. It is needless to point out that the complete absence of preference to the Diploma in Museology from advertisements pertaining to Museums post proves highly disappointing to Diploma holders and in desperation they seek employment in other fields unconnected with museum work. This condition calls for early remedial measures.

Although the subject of Museology is now being taught in India at the Post-graduate level for more than ten years, our old conception of staff recruitment has not changed. This is in sad contrast to the high standards adopted by the British museums which clearly stated in their public advertisements that preference will be given to those candidates who hold the Diploma of the Museums Association of the Great Britain. The accent is not so much on the subject proper as on the practical training in museology or modern museum

methods. Rather, the accent is on the principle that if there is a recognised professional training course in the country, every effort should be made to absorb as fully as possible, all the Diploma holders for service in the British museums. Unfortunately it is not generally realised by the museum authorities or University circles in India that these Indian Museology courses could contribute a lot to the future of India's Museums.

Trained vs. Untrained Curators

In this connection, it may be of some interest to note the difference between a trained and an untrained candidate from a recent example of an important Museum now under the administrative control of the Department of Museums, Gujarat Government. For the last five years, this important museum of Gujarat was in charge of a highly qualified Curator who possessed a good Master's degree in Ancient History and also a degree in Law. The choice was quite suitable, judged from the old curatorial standards in the Indian museums. But it is a known fact that the Curator could hardly do anything to improve the hopeless condition of the Museum during the last five years of his tenure in spite of Central financial assistance on a small scale. However, as the pay-scale of that museum is very poor, he resigned for better prospects and left the museum profession for good. This helped the authorities to fill in the vacant post by a 2nd class M.A. in Ancient History, who had also completed the two years' Museology course at the M.S. University of Baroda, in 1964. The difference between the present trained person and the previous Curator of that Museum could be seen even by an unobservant eye. The present curator prepared a scientific catalogue of the collections, in a short period of two months. The previous man did not know what a museum catalogue was. The trained Curator further embarked upon the preparation of plans and estimates for modernising the museum in a real scientific manner. I have given a concrete example to show the advantages that accrue from the appointment of a properly qualified and trained candidate in Museology on a responsible museum post. However, this is a point which should be seriously considered by the authorities of our leading museums who have still got several vacant posts to fill in.

A Sound Training

Dr. Rowson has stressed in his report that the training given in the Museology Departments at Baroda and Calcutta is far superior to that given in any archaeological auxiliary course. He found the Museology students alert and well-informed and clearly capable of playing a vital role in improving museums of India. He also examined various dissertations prepared by the Museology students and observed that the standard of these dissertations based on various aspects of museum collections as well as museum work are generally high, some of them being academically outstanding.

Master's Degree in Museology

In view of these considerations, Dr. Rowson, in his report to the University Grants Commission has strongly recommended that the Museology Diploma of the University of Baroda and the University of Calcutta, be accorded recognition

as equivalent to M.A. or M.Sc. without delay. This has completely been endorsed by the Departments of Museology in India. Therefore, it would be in the fitness of things if the Post-graduate diploma in Museology offered by the Universities of Baroda and Calcutta is called in future "Master of Museology". This would bring about a change in the situation and these capable and trained youngmen would get proper recognition which they fully deserve.

Anil Roy Choudhury

The Need for Documentation

The safeguarding of collection, their identification, and their easy and immediate location, were initially the problems for museums and art galleries to tackle, as they were first established. With the passage of time, and with the advancement of museum thinking, documentation in a museum has assumed greater importance. Ever increasing additions to the collection raised the problems of maintenance and upkeep of the bulk in storage. Their rotation in selected groups, organisation of special exhibitions by adding collections through loans from other institutions and individuals, and reciprocal loaning out of exhibits to sister organisations, made museum documentation further complicated. Besides, safety being the foremost concern of museum authorities, procedures of documentation in a museum have undergone minor or radical changes, whenever flaws were discovered in the system against loss or replacement, or other measures were adjudged to be superior to the existing procedures. Museum documentation, therefore, is in a continuous process of improvement, based on a series of experiments carried out by different organisations, at various levels, to ensure greater safety to the collection.

Survey of Documentation Procedures

A survey of the prevailing documentation procedures of museums and art galleries of various countries or regions, was made during the last few years by museum associations, or through the combined efforts of the major organisations of a region, or by Governments controlling them. Standardised systems were laid down for the museums within their regional boundaries, or under their administrative control. At the Registrar's Session of the 1952 meeting of the American Association of Museums, it was resolved to lay down, for the first time, standardised rules and regulations for registration and cataloguing in the American and Canadian museums, and a very useful book, 'Museum Registration Methods' was published in 1958. The Museums Association, London, published a series of articles in 'Museums News' on the subject, and the Victoria and Albert Museum, London, initiated the British Museums to follow improved standardised rules and regulations, for registration and cataloguing museum objects. The Association of the Museum Directors in the Netherlands published in 1953 'Richtlijnen Wn Winken Voor Het Akministratief Beheer Van Museumverzamelingen' about the organisation and administration of Dutch museums. The Czechoslovak museums, functioning under the Ministry of Education and Culture of their country, published in 1954, a valuable book, 'The Control of Collections in Museums' through their Central Methodic Institution, a specialised department of museography which looks after their documentation procedures—'Narodni Museum V Praze—Kabinet Musejni A Vlastivedne Prace'. The Government of Bulgaria, through their Ministry of Education and Culture, have formulated

instructions on the fundamentals of State Registration of Museums. Similarly other governments, museum associations or individual institutions, laid down procedures for safeguarding their collections, and formulated rules and regulations to register, catalogue, locate, transfer and to guide a host of other museum activities of their respective regions.

A careful study of these procedures was made by the author with the active co-operation of experts in the field from different countries, and in 1963 was published in India, 'Art Museum Documentation and Practical Handling' where suggestions were made for adoption of specific procedures by museums of varied categories. It should be borne in mind, that as museums are of different dimensions and importance, inasmuch as they collect objects of diverse values, both monetarily, and in consideration of their national and international significance, and also in numbers, and rules and regulations for safeguarding them will vary to a considerable extent. Also, the sphere of the collection, whether pertaining to art, science, sport or natural history, will call for separate measures. In the U.S.A., where museums are largely private properties, administered through separate Boards of Trustees, rules and regulations guiding the collections differ, and they are often altered to suit their individual convenience. In the United Kingdom or in India, museums and art galleries are public properties and are administered by the Government either directly or through nominated boards. The documentation procedures guiding their collections, will in many aspects, especially where administrative control is concerned, be different.

Need for Improved Documentation Procedure

Broadly speaking, however, museums, irrespective of their sphere of activities, dimension, or importance, work for the common objective of educating public mind. For this, the collections have to be registered, catalogued and preserved. They are to be studied from many angles, for their proper identification, safeguarding from climatic hazards, wrong handling and transportation, and from theft and replacement. And finally, thorough investigation has to be made on the collection to prepare data for their eventual use in imparting knowledge and understanding. Systematic scientific documentation, therefore, has to be introduced in all museums.

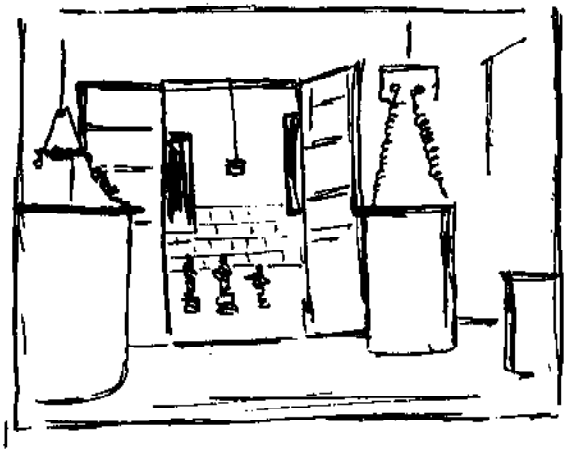
In India, the introduction of improved documentation procedures for our museums is all the more necessary, as objects of great national and international value are lying unaccounted for, or inadequately documented. In fact, their security is more or less dependent on the sincerity and integrity of the museum staff. Besides, even if an object is detected on its way out of the country, to prove its earlier association with a particular museum is rather difficult. One line entry in its register, for example, "Seated Buddha, Gupta Period", is insufficient for identification and reclamation.

Documentation System Explained

The control of entry and exit of collections is a highly responsible function. Of the stream of objects a

museum receives from the outside world, some remain in the museum, others do not. But every one of them must be recorded. As in a bank, the books must balance. Therefore, the introduction of an Entry Register, with a single line entry, and to note against each item, the manner of its disposal; if accepted, to quote the registration number, and for others leaving the museum, a reference to the receipt by an individual, postal, truck, railway, ship or air transport, has been suggested. Besides, for registration and cataloguing of these objects which are acquired by purchase, through gift or on loan for considerable period, the maintenance of (i) an Accession Register, with one line entry, loose-leaf or bound, (ii) Identification Catalogue Card for elaborate recording on each object for its identification, and for future research on the item, and (iii) File Cards to locate objects, through cross-reference. The maintenance of a small or large size Identification Catalogue Card, for simple or elaborate recording on each object, or a batch of small size cards, tied together, to note each one of the important data on the exhibit, depends on the importance or otherwise of the collection, and the status of the museum. While a small size card with a little information, may work satisfactorily for an institution of minor importance, such as a school or a village museum, elaborate recording on many aspects, may be necessary for the exhibits of the minor museums. The maintenance of a batch of small size cards, each devoted to a datum on an important exhibit, is particularly helpful for research personnel. Similarly, to avert replacing originals by copies, especially in an art gallery, where masterpieces are allowed to be reproduced, suitable rules and regulations have been framed to safeguard them. With the increase of activities, such as loaning out to individuals or organisations unimportant originals or prints or artifacts, not of much value, on rental basis for decorating private houses, or buildings, or for commercial reproduction rights of museum pieces, appropriate rules and regulations are being introduced.

It is true, that in the post-independence period, some of our museums introduced improved recording procedures for their collections, but these are considered inadequate for their protection, and for the preparation of materials for educational purposes. As the custodian of Indian museums, the Government of India may consider constituting a Documentation Centre for introducing advanced system of recording procedures for all museums in the country. There will be variance in details, in consideration of the dimension, scope and category of individual museum, but in general, all museums may adhere to a uniform system of recording. The Documentation Centre will keep it abreast of procedure which are being evolved by museums, far and wide, and recommend those found useful and satisfactory. But procedures, however, carefully prepared and prescribed, cannot be taken full advantage of, unless their application is understood and followed. The Centre will train museum personnel to handle documentation, and will be responsible for periodical scrutiny to ascertain that all museums are following the prescribed procedures.



S. T. Satyamurti

Museums of Technology

Museums of Science, Industry and Technology are a class by themselves and are beginning to be increasingly popular in recent years almost all over the world. but more particularly in Western countries and in certain other advanced countries such as Japan in the east where there has been tremendous industrial and technological progress. Although the conventional types of Museums such as the Archaeological, Art and Natural History Museums help us to understand and appreciate our past cultural heritage and the faunal, floristic and mineral wealth of this world and the manifold marvels of nature, yet in this modern atomic and space age, it is perhaps only the Museums of Science, Industry and Technology that can adequately help us to appreciate the tremendous advances made in the fields of science and technology within the past few decades and helpfully guide us through the present and point to us the way into the dangerous uncertain future of mankind.

Science Museums are therefore, of the utmost importance in enabling the layman to understand the latest developments that are being made in all fields of science and industry in this modern age, thus incidentally helping him to foresee intelligently the possibilities that science can hold out for the future of mankind.

Dearth of Science Museums

Unfortunately, Science Museums in this country are yet few and far between, and

perhaps apart from the Birla Technological Museum in Calcutta and the Visvesvaraya Industrial and Technological Museum in Bangalore, there is hardly any Science Museum in India worth mentioning. However, the progress achieved by these two Museums is extremely promising, and in the context of the present space age, it is essential that concentrated efforts should be made not only to develop and expand these already existing Science Museums in this country but also to establish a larger number of such Science and Technological Museums so that they would adequately reflect the rapid industrial and technological progress made in India and several other countries as well, at the present day, and to help the lay-man as well as the industrialist to keep himself abreast of the latest developments in this fascinating sphere of human knowledge. Museums should point both to the past and to the future.

A glimpse into these advanced and specialized Museums, especially in the western countries, is therefore, a fascinating and extremely educative experience, and since I have had the privilege of visiting some of these modern Museums of Science and Industry in the United States of America and in Europe, I would like to share with the readers some of my impressions of my visit to these museums.

A Vital Experience

These museums of science and industry serve to present the common man with a graphic picture of the various basic scientific principles, the history and evolution of the various human accomplishments, achieved through the aid of science, such as lighting, time-keeping, communications, transport, mining, etc., in a dramatic way. Apart from this, these museums also seek to give a vivid portrayal of the various recent technological developments. The contents of these museums, therefore, present an endless and ever changing panorama of all that science has contributed to human welfare and happiness from the very beginning. A visit to these museums is therefore, a vital experience and a real education in itself. There are several such museums scattered all over Europe and America, but I shall have time to dwell here only very briefly on two of the most outstanding of these Western Science Museums, namely, the New York Museum of Science and Industry and the Deutsches Museum in West Germany, these being typical examples of modern science and technological museums.

New York Science Museum

The New York Museum of Science and Industry is housed in the enormous skyscraper building of the Rockfeller Center and was officially opened in 1936. Distinctly modern in its architecture and exhibition arrangements, the Museum of Science and Industry is located on three levels, occupying approximately 60,000 square feet of floor space. In a modern setting, with concealed illumination, harmonious colour schemes and built-in display cases there are over 2,000 dramatic exhibits continually presenting the pagent of the march of Science through the ages, climaxed by graphic displays demonstrating the outstanding achievements of modern scientific research as applied to industry. Many hundreds of these exhibits are

operatable by push buttons pressed by the visitors themselves, thus giving the Museum its popular name, "The Hall of Motion". One can see literally "Science in Action" in this Museum.

One very interesting series of exhibits in the Transport Section of the Museum is entitled "What makes them go". These consist of models of engines used in different types of vessels, including the old-side wheelers, river boats, ocean-going passenger liners and freighters and yachts that are shown in this interesting collection of historical and modern marine engines and these may be operated by the visitors themselves.

Visitors feel like real engineers for a few moments when they press buttons and set the wheels of locomotives turning. Automatic signals also operate on these miniature railways, whose locomotives and coaches are all reproductions of actual historic and modern engines and passenger and freight trains.

London Science Museum

The Science Museum in South Kensington in London, offers more or less a similar type of display, consisting of exhibits designed to illustrate basic principles in Science and attempting to trace the history of Science and various scientific achievements in their evolutionary sequence. But what impressed me most in this Museum was that apart from the regular halls intended for the adult visitors there was a separate gallery in the basement—the Children's Gallery intended primarily to serve as an introduction to the main collections of the Museum and seeking to present facts and phenomena in a simple and easily understandable manner. We have here a variety of exhibits arranged in a simplified series illustrating facts about the earth's atmosphere, the history of time-keeping (sun-dial, hour-glass, water-clock, etc.) and the evolution of transport, lighting, communications and similar features which marked the progress, of human civilization.

Munich Science Museum

In 1962, I had the privilege of visiting several Museums all over Holland and West Germany. The largest and most spectacular of all German Museums is perhaps the Deutsches Museum in Munich, West Germany. Founded in 1903 by Oskar von Miller, it developed rapidly into a magnificent Museum of Science and Technology. If one cares to walk along all the galleries of this vast Museum, following the course of all the exhibits in detail, one would have covered a distance of nine miles. So immense and extensive are the galleries of this Museum. This wonderful Museum aims at presenting a comprehensive picture of the evolution of Science and Technology in all their varied phases. The exhibits consist either of original apparatus and machinery or of carefully constructed scale models which can be operated by the visitors themselves who can thus obtain a clear idea of the fundamental scientific principles in the field of heat, sound, light, optics, dynamics, magnetism and electricity. There is a good deal of animation everywhere among the exhibits in this Museum and visitors feel that they have whole drama of Science enacted before their very eyes as they pass throgh the various galleries.

There are enormous galleries devoted to motor transport, rail transport, water transport, ship-building and air transport, etc. Everything is real and of life-size and is treated from an evolutionary stand-point—old models being shown first, leading on gradually through intermediate types to the more modern ones.

There are also several large galleries devoted to physics and Chemistry. In the Section on Physics, various scientific principles in heat, light, electricity, magnetism, sound, optics, etc., are graphically illustrated by working models which the visitors can themselves operate by pressing push buttons. For example, the Magdeburg's hemispheres, demonstrating the tremendous power of air pressure on a vacuum, inclined planes, pendulum, simple machines, spiral motion spectrum, the law of gravitation, etc., and the numerous laws governing the various scientific phenomena, the beginnings of wireless radio and television—all these are graphically portrayed by vivid, dynamic exhibits which are at once educative and entertaining.

Depicting History of Science

The Deutsches Museum is also noted for its various historically famous exhibits which depict clearly the history of Science. The entire room and laboratory of Galileo in Florence, for instance, is faithfully reproduced with all its paraphernalia—consisting of various antique scientific instruments—all in original—such as globes, telescopes, microscopes, balances, etc.

There is a very large and interesting section consisting of several halls, devoted to chemistry. The old alchemists' workshops with their original instruments are dramatically depicted in life-size reality and the laboratories of Lavoisier and other famous chemists are faithfully reproduced in original form and are of great historic interest. The history of chemistry is thus graphically depicted in these great antique laboratories. A modern laboratory is also shown side by side with workable apparatus, part of which is constantly in operation. Several experiments can be carried out by the visitor himself.

Spectroscopic analysis is very graphically illustrated in a tangible manner. If the visitor presses a button corresponding to a particular metal, a flame immediately lights up and gives the characteristic colour pertaining to that particular metal—i.e., sodium gives a yellow flame, barium green, lithium scarlet, calcium brick-red and so on.

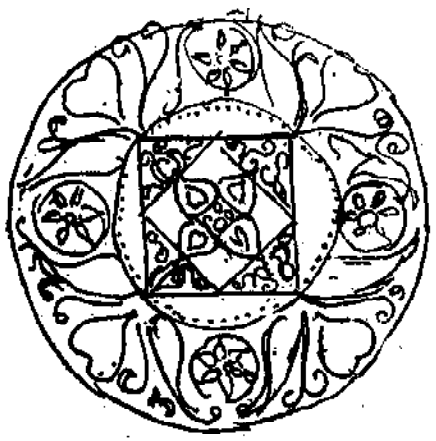
Another very interesting exhibit was a huge working model showing the various by-products derived from coal tar. This exhibit appeals not only to the visual sense but also to the sense of smell. There are buttons, which when pressed, light up the names of the appropriate products and also at the same time the visitor can smell the particular substance by turning the perforated lid of the corresponding bottle in which a small sample of the product is kept and a current of air is made to rush through it *e.g.*, naphthalene, rose oil (synthetic), vanilla chloroform, benzene etc.

The Planetarium

However, the most wonderful spectacle of all we saw in the Deutsches Museum was the Planetarium demonstration. It

was a superb display of the starry heavens. with the Milky way, the constellations, and the planets of the solar system projected in all their pristine grandeur on the domed ceiling of the Planetarium Hall on the top floor, where the manifold marvels of the heavenly bodies in the Universe were unfolded before our very eyes to the accompaniment of a beautifully synchronized and scientifically authentic recorded commentary. A Planetarium forms an integral part of every modern Science Museum as it is the only practical means by which the wonders of the Universe can be brought home to the layman as well as the student.

Science Museums, therefore, stand apart as a class by themselves differing from all other categories of museums in their intensely practical approach. In these museums scientific principles and their practical applications in industry and technology are demonstrated to the visitors in a practical and dynamic manner and in a way in which no other type of institution can hope to do. Their realism makes them both educative and entertaining. They are vital in the context of our present age of phenomenal industrial development. They are perhaps the only means by which the ordinary man can be educated in the recent tremendous advances in Science, Industry and Technology. Science, Industrial and Technological Museums therefore, contribute in no small measure to the education of the masses and the all round progress of the country, making the citizens better fitted to adjust themselves to the revolutionary changes that are taking place at the present day, and to face squarely the realities of the future.



Amalendu Bose

The Role of a Science Museum

In India today we are passing through a great industrial revolution. Unlike political revolutions, industrial revolution demands the raising of the educational standard of the people and an increase of efficiency of industrial workers. We constantly hear the continuing need in the country for more scientists, more engineers and more technically trained people, the shortage of which is retarding industrialisation. We have to educate our young men as fast as we can; we have to inculcate in them a consciousness that only with the raising of educational level we can catch up with other industrially advanced nations. The faster we are able to train scientists, engineers and technicians and to raise the general educational standard of our young men, the better we are able to increase our potential. In the overall education of the country, science has to be brought to them in a form which they can assimilate easily. To this end the museum of Science and Technology plays the most important part. Not only it inspires the school boy and makes him observant and critical but it also makes him conscious of the role of industries in the growth of the nation.

Educating Masses in Science

In this great country of ours there are also besides children, teeming millions of adult illiterates. How to educate illiterate population in science is a great problem which has to be faced. Should we let this vast majority drift in ignorance and be unable to share in the building of an industrial India or should we give them an insight into the mysteries of science and technology. The museum of Science and Technology is the only place where the layman can understand and appreciate the role of science in the environment he lives in.

The museum of Technology is an educational institution, the purpose of which is to acquaint the general public with science and its application to industrial processes. It is also a place where objects are arranged in a way to facilitate the study of history of science and technology. One of the pioneer museums in the United States, namely, the Museum of Science and Industry, Chicago, hopes to make every visitor appreciate and understand from their museum the following dictum:

> "Science discerns the laws of nature;
> Industry applies them to the needs of man"

Museum an Aid to Education

The term "Museum of Techonology" embraces a number of institutions of very different character but same objective. The objective is the popularisation of science and to encourage an observant and critical attitude in the visitor.

With the beginning of the present century museums have come to be recognised as an aid to education. A science and technology museum serves as an aid to the scientific learning, but it does not profess to take up the role of high school of university. It more or less acts as an ancillary to what is being taught in the class-room.

The Scope of Museum of Technology

Science and Technology are so interwoven with each other that no museum can be strictly called a pure science museum or a pure technological museum. Almost all the museums whether they are called a science museum or a museum of technology or an industrial and technological museum or a science and technological museum or a museum of applied science, show the principles of basic science and their application in industry and in day-to-day life. By the expression "Museums of Technology" we may refer to all such museums. Certain exceptions are there like the "History of Science" museums at Leiden or Florence or Oxford where can be seen a collection of only historical instruments and apparatuses such as microscopes, telescopes, clocks, astronomical instruments etc. which are unique of their kind and very useful for the specialist visitor.

Most of the authorities feel that the science museums should concern themselves with the school children for they have the most receptive minds. Most of the exhibits are therefore planned to attract and explain to the school children although some exhibits are also planned to attract those whose education is more advanced. A museum is a place principally to display three dimensional objects. Such objects as cannot easily be shown in a book and what the student has no opportunity to see in his class room. The emphasis in a museum is more on presenting objects or products rather than on ideas or postulates or theories. The exhibits are arranged in a museum of technology in such a way that they tell a sequential story. The German and the Swedish museums show a few landmarks in the historical development of the subject, followed by some recent advances and their application in industry. The Museum of Science and Industry, Chicago, lays down the most effective formula of presentation in holding

visitor's interest as well as in facilitating his understanding as follows: (1) basic science (2) discovery and invention (3) development (4) manufacture and use; and (5) potential and social implications.

The Pattern for Presentation

Museums need not follow a rigid rule of pattern for presentation in their galleries. Taking for example the paper and pulp industry, a section on this subject in the museum would show inter alia

a. Raw materials required for paper making.

b. Process of manufacture of paper starting from the raw materials.

c. Different pulping processes.

d. Methods of folding, perforating or cutting paper.

e. Different selection of papers such as writing paper, printing paper, wrapping paper, coloured paper, blotting paper, cigarette paper etc.

f. A few paper products.

g. Properties of good quality paper.

Some museums like the Science Museum, London, add to this section models of machines for cleansing and tearing rags used in paper making, while dandy rolls for adding the "water mark" are also shown. The Franklin Institute, Philadelphia, actually makes paper before the visitor with the help of a model "Fourdrinier" paper making machine. In the Tekniska Museum in Stockholm further interest has been introduced by adding exhibits to show the structure of tree, arrangements for transporting logs to timber factory and different types of timber cutting saws. Also samples of hand made papers used before the paper industries were started, enrich the gallery in Stockholm.

It is interesting to watch the trends in the present day museums of technology. Gone are those days when people could enter into the museum and meet an array of showcases containing variegated objects with dustly labels which people would seldom stop to read unless they were scholars. Modern museums provide invariably a pleasing atmosphere where exhibits are arranged artistically and where one could operate without external aid a number of exhibits. Labels are there but the main centre of attraction are the working models themselves. A youngster feels the thrill of movement and is attracted because the exhibit can be operated.

In almost all the museums the visitor is allowed to roam about as he likes, sometimes freely according to his choice or guided by signs. It is only when the visitor wants to know something that the museum guide steps in. In many of the museums in Europe the guard and the guide have been combined into one person, who is able to give a reasonable explanation as regards the collection.

Groups are invariably attended by Gallery demonstrators or lecturers belonging to the museum or if the museum cannot maintain one, as in many places in Europe there is always a free lance guide-*cum*-demonstrator who could be engaged by the museum on payment of a nominal charge. There are a number of mani-

pulating appliances which are not self operating which the guide demonstrates to the visitors and answers their queries. In most of the museums in the Western countries there are a number of important exhibits such as the Foucault's pendulum, the Cascade generator, the Watt's engine etc. which are worked at fixed time of the day. These are called fixed time demonstrations and the same system is practised in both the technological museums in Calcutta and Bangalore. Some of the fixed time demonstration that we are now showing at the Visvesvaraya Industrial and Technological Museum are for example, demonstration of the discharge of electricity through gases, operation of a radio controlled boat, operation of a room of electronics etc.

Museums also provide initiation classes for teachers. It is felt that a teacher will be able to utilise his time effectively when he comes with his school group if he has a look at the museum beforehand and if he is explained the sequence and operations of the exhibits. It is also necessary to maintain a close contact between the school curricula and what the museum is trying to display. This method was tried at the Birla Museum, Calcutta, and has been very popular ever since.

Film shows and libraries

Scientific film shows are regularly held in Science museums. Many of the operational steps or workings in industries which a museum cannot show in detail and many of the scientific fields which a museum has no space to show are best displayed by means of scientific films.

Libraries form an important part of every science museum of the world. Usually such libraries contain popular scientific books where a boy can find answer to many of his queries. But in many cases the library attached to science museums is considered as the main national scientific library. This is true for both the science museums at London and at Munich. One of the major research libraries in the United States is located in the Franklin Institute which houses a science museum. This library has an unequalled collections of texts, pamphlets and periodicals in the applied and physical science.

Lectures and Extension Services

Museums periodically arrange scientific lectures for visitors. These lectures cover wide fields. I have come across learned lectures on history of science in the Palaris de la Decouverte, Paris, for which renowned scientists from universities are invited. The topics included subjects like, history of cellular theory, the first aerostatic ascent, the philosophy of the algebra of Lagrange, the social condition of scientific progress in Poland in 18th century, etc. Museums which have qualified lecturers like the Science Museum, London arrange with the help of their staff more popular lectures for the visitors the topics being say, rise of steam power, story of television, treasures of the museums, etc. Sometimes the lecture is specially meant for the school boys and is accompanied by demonstrations much like a school or college lecture. The objects from the galleries are specially brought and the lecture is centered round them. The Birla Museum, Calcutta, has gone a little ahead

in this field. Recently they conducted a school science programme where the museum's lecturers explained the function of electric motors and generators by using rough and ready motors and generators made in the museum. The rough and ready apparatus have a greater appeal for the students rather than finished and attractive looking equipments purchased from the market because the students feel that they can make themselves a similar one.

The Science museums also nowadays have various extension services. One such service is the travelling science exhibition. Science museums are usually placed in big cities. They grow up in stature and importance because of the proximity of large number of schools and colleges in the city. From time to time, visitors may also come to the museum from suburban areas but the number is small. The vast majority of population living outside the city do not get an opportunity to visit the museum. The travelling science exhibitions imply that the exhibition must travel from place to place so that people can visit the exhibitions carried in mobile units in specially prepared vehicles. Sometimes the vehicle or musemobile as it is called, is itself a self-contained unit so designed that the visitor can go through the unit. Another type of travelling exhibition which has been developed by the Oakridge Museum of Atomic Energy, USA is a travelling exhibit which can be carried in a truck but could be taken out and set up for display in a building or in a convenient location. The Birla Industrial and Technological Museum, has already started travelling science exhibition of the latter type and has met with good response.

To make rapid progress in industrial and technological fields, museums make effort to discover, foster and develop the creative talent of the young men. In many museums of science, science workshops have been set up where youngsters work on their own in workshops as a hobby. The U.S. is leading in this field and it is said that these workshops are designed to give the interested student an opportunity to broaden his appreciation and awareness of science. The Franklin Institute museum has even provided adult workshops covering technological and hobby themes.

Museums organize also students' seminars where the pride of place goes to the students themselves. This system is very effective as the students can talk in their own language and at a level which they themselves can easily follow. A competitive students' seminar was arranged at the Birla Museum, Calcutta on Man's hazards in space flight, Moon—our nearest neighbour and sputnik—the flying laboratory.

Museums in the United States have been arranging as annual events, science fairs where students participate with projects developed by themselves. Submissions include projects in animal, human and plant biology, chemistry, electricity, mechanics, earth and space sciences.

The recent trends in the museums particularly in the museums of techonology are interesting to watch. The old boundaries within which the museum had to function are fast disappearing. New horizons are appearing and it is now before the new museums to set their own yardsticks for educational programme.

T. R. Gairola

The collections in a museum consist of the works of art, the objects of natural history, scientific interest and other items which represent culture in some form or the other. Most valuable among them are the items of cultural heritage represented by sculptures, paintings, drawings, manuscripts articles of handicraft, and other artifacts. These materials are used in museums for research and educational purposes. Conservation aims at preserving these objects for posterity so that they can continue to throw light on the history and civilization of the nation. As such a very great responsibility devolves upon the conservator to preserve them for the future. This is one of the very important functions assigned to the various sections of a museum.

Deteriorating Factors

Mere keeping of the museum material in show-cases is not enough to ensure preservation from deteriorating factors which continue their destructive effects on the objects. These factors are: (i) climate, (ii) physical and chemical agents, (iii) biological agents and (iv) mechanical causes. Hot and humid weather with frequent changes is the worst enemy already affecting the maintenace of museum material. These cause the growth of micro-organism and efflorescence and deliquescence of hygroscopic salts. As we well know that in a country like India, in certain parts, there are extremes of temperature and humidity throughout the year. These extremes cause frequent changes in humidity and tempera-

ture conditions. The result is that such objects as wood, textile and paper have to experience expansion and contraction in their fabric very frequently throughout the year. The factors stated above have individual and cumulative effect on museum objects and cause one or the other ailment.

Hospital for Exhibits

The ailments introduced by various agencies of deterioration could be compared to some extent to the ailment of human beings and animals with the difference that the museum objects do not speak for themselves while the former can state the symptoms of the ailments. As we have hospitals for catering to the needs of the sick and the destitute population of the town, similarly in good museums it is imperative to have scientific laboratories where preservation and conservation of museum material could be taken up in a scientific way. If we consider the whole question of preservation from this point of view, every antique object needs some sort of curative treatment and subsequent preservative treatment which may keep it protected from agencies of deterioration for as long a period of time as possible.

Plastics and Resin Preservatives

With the development of museums, the science of preservation has also taken rapid strides and has reached high standards of efficiency by now. Physics and Chemistry have placed at our disposal a large range of instruments by which we can investigate the technique of manufacture, the causes of deterioration, and study of material more precisely. A large variety of synthetic plastics and resins have been invented and put in the market for use as preservatives, fixatives, and adhesives for museum materials.

Functions of Museum Laboratory

The work of preservation and conservation in a museum laboratory deals with chemical, microchemical, spectrographic, microscopic, photomicrographic, metallographic, petrological, X-Ray ultra-violet and infra-red examination which can help in revealing complete analysis of the material. The other functions of the conservation laboratory is to carry on (1) the chemical cleaning of museum objects, (2) elimination of deleterious ingredients, (3) sterilization and fumigation to destroy fungus, mildew, bacteria, insects, and other pests, (4) impregnation of the material with preservative solutions, (5) reinforcement of the weak portions, (6) creating suitable lighting conditions for light sensitive material, (7) introducing air-conditioning measures, best suited for the preservation of the material, and (8) restoration.

Problems of Restoration

There is sometimes a misunderstanding about restoration. There are certain considerations on which this is carried out. It is confined to proper reinforcement of the weak portions by giving support and filling in missing portions. Certain amount of artistic skill is required to achieve this. The restoration should be fine and in-obtrusive and should harmonise with the texture and colour of the object as closely as possible. It is carried out to the extent necessary to render the object fit for exhibition or safe storage. The material used for this purpose is inert and has no deleterious effect on the original object. The filling up of the missing portions is carried out only when

positive knowledge as to what existed in the lost area is known. The additions made differ to some extent from the originals and if necessary can be eliminated when desired.

Preservative Treatment

The work of preservation on scientific lines was started only about 85 years back when the first museum laboratory was established in Berlin; and in India, museum specimen were treated for the first time for preservation purposes only about 47 years ago. This country being in a tropical zone, gets quite humid and dry with variations of temperature throughout the year and as such the problems of conservation of the cultural heritage that is stored in the museums of the country is more complicated specially because of the variety of material and the nature of their antiquity dating back from the Indus Valley Civilization.

A Network of Laboratories

There are about 180 museums belonging to the Central Government, the States, Universities, Corporations and other institutions. All these without any exception, require scientific preservative treatment for conservation. A good central scientific laboratory is, therefore, a great necessity and this may be assisted by some zonal laboratories covering the length and breadth of the country. Good co-ordination between these zonal or regional laboratories and the Central laboratory is the need of the hour. The functions of the Central laboratory could be basic scientific research in preservation science, assistance to the technical laboratories, regular contact with the staff of the laboratories and training of Indian specialists in conservation work. The technical laboratories will deal with technical studies of ancient materials and carry out conservation work of the museum material. This idea of having the two types of laboratories is based on the fact that setting up of the laboratories is quite difficult in these days of acute shortage of foreign exchange and non-availability of high precision chemical and physical appliances in the country. While the Central laboratory can have the costly equipment involving foreign exchange, the regional laboratories could depend on indigenous supplies for their needs.

The establishment of too many laboratories is full of risk as an ill-equipped laboratory is likely to do irreparable damage to the material. Even in America they are experimenting on the formation of Inter-museum laboratories as for example in Oberlin (Ohio State), which serves a group of 11 museums and galleries.

Centralized Agencies

For some time the understanding and awareness of the importance of the care and preservation of museum material has increased tremendously. As such the need for creating Central agencies on international levels to serve as co-ordinating and clearing houses for information on preservation is being repeatedly stressed, so that sound professional training for conservators and stimulation of scientific research can be affected. Importance is also being attached to standardization of conservation techniques.

In the field of conservation two international institutions have since come into existence: (i) the International Institute for Conservation of Historic and Artistic Works, London (IIC), (ii) the International Centre for the Study of the Restoration and Preservation of Cultural Property,

Rome (Rome Centre) which are engaged in collecting, studying, circulating documentation concerning preservation, restoration, co-ordination, stimulation of research, advice in specific problems, assistance in training research workers and technicians and raising the standard of work. The International Centre of Museums (ICOM) came into being between the two world wars. ICOM founded (in 1948) after the last war continues this work. Such publications as Mousieon, Technical Studies in the field of Fine Arts (Fogg Art Museum Boston), Museum Journal (U.K.), Museum (UNESCO), ICOM News, Technische Mitteilungen fur Malerei (Germany), Studies in Conservation and IIC Abstracts (London) and Museum News (America) are doing a great service in this direction.

Role of National Museum Laboratory

The need of setting up the preservation and restoration department in the National Museum of India, New Delhi, to carry out preservation and scientific examination of its collections, was recognized at the time the Museum assumed an independent status in 1957 and a laboratory, as it now exists, was organized. This laboratory is still by no means complete. But eventually it aims at handling all the conservation problems peculiar to this part of the world. It is a nucleus laboratory with trained staff of specialists. Heavy equipment not available in the country was imported with the assistance of the India Wheat Loan Educational Exchange Programme and of the UNESCO.

The material dealt with for preservation and scientific examination in the National Museum, is of varied nature and consists of metal objects, including bronzes; arms and coins of copper, silver, gold and their alloys stone sculptures; terracottas and stucco objects; textiles; costumes; paper manuscripts painted; and architectural fragments of wood; ivories; mural paintings and prints. To give an idea of the quantum of work which the laboratory of the National Museum has handled during one year, 2800 objects were given chemical and other preservative treatment in the laboratory. In addition, relevant chemical analysis and scientific examination of material were also carried out as required for planning future treatment and for deciding on proper conservation techniques.

Short-term Course

The laboratory also organised a short-term course on "Care of Museum objects" for three months from March to May, 1965. It intended to arouse in the participants a consciousness of the constant deterioration from which museum objects suffer. At the end of the course it was felt that the students got an idea of the conservation problems that are encountered in a museum of art and archaeology. They could recognize the symptoms of deterioration whenever and wherever they occur and they could at least understand that conservation is a serious task requiring experience, practice and perseverance and that half hearted measures of conservation are more harmful and damaging than no conservation at all.

Extra Departmental Work

Besides meeting the needs of the National Museum, there has been a pressure on the laboratory of very urgent preservation work of other museums and institutions of the country. The laboratory has been accommodating such work in the spirit

of saving national treasures in the museums from destruction. These objects being very fragile and of great historic and artistic interest, have to be preserved immediately as otherwise, they would be lost for ever. These requests are becoming more and more pressing for some time past. Now the Central Advisory Board of Museums has passed a resolution that a Central Laboratory of museums be created in the country. On the recommendations of two UNESCO experts *viz.*, Dr. P. Coremans, Director of the Institute Royal due Patrimoine artistique Brussels and Dr. Plenderleith, Director, International Centre for the Study of the Preservation and the Restoration of Cultural Property, Rome, this laboratory has been asked to play the role of the Central Laboratory for Indian museums and also to plan for further development in the field of conservation and training.

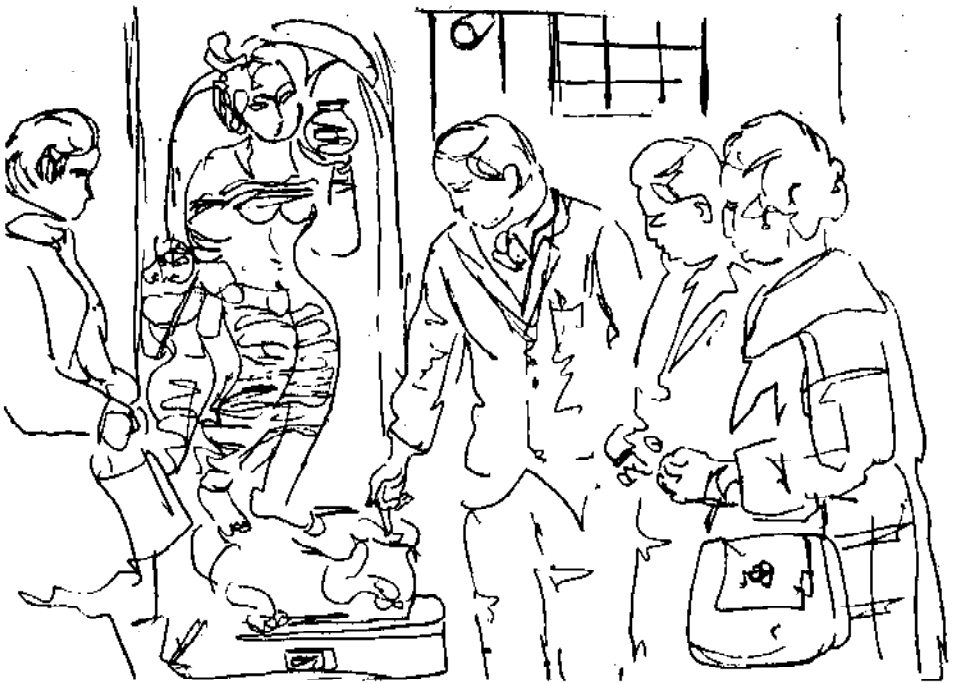
The Difficult Task of Conservation

To illustrate examples of conservation work done in the laboratory of the National Museum a brief description of the methods employed in the conservation of a large size Kakemono painting from Salarjang Museum, Hyderabad and a painted decorative wooden bracket piece is given here. One of the illustrated photographs shows the fragile and deteriorated condition of the painting. The paper on which the painting was executed was highly acidic. It had lost all flexibility, had become very brittle and had developed large number of cracks and creases. It had three layers of paper at the back which had been pasted at different time intervals to the original paper in order to strengthen it. The painting was getting deteriorated gradually till it reached the present condition.

The second object treated was a wooden piece from the National Museum, New Delhi. It was covered with layers of painted designs one over another done at different intervals. Scientific examination showed that the paintings were done in tempera (with a water soluble medium). Microscopic study of the cross section of the painted layers suggested the presence of three layers of painted surfaces. On the top, the object was covered with shellac varnish which had become brown and was cracking largely. The layers of paint and shellac had completely hidden the details of the original painted surface and had obliterated the finer details of the carvings (See illustration).

The painting on paper was completely skinned. This was done by removing the three layers of paper at the back one by one along with the adhesive that was used. The back of the paper on which the painting was done was freed from all earlier adhesive material which contributed largely to the destruction of the painting. Since it was a water-colour painting, the pigments were all fixed with suitable preservatives before treatment for skinning was undertaken. The painting was then given support of silk backed by Japanese paper. Its condition after proper preservation can be seen in the illustrated photograph.

The painted wooden object was trated for removal of the brittle varnish on the surface and then the two layers of paint or it were softened with mixtures of suitable solvents and proper restrainers one by one till the original painted surface of the object was reached. Its condition after preservation has also been illlustrated.



S. M. Nair

While the classical methods and techniques for the preservation of biological specimens remain more or less unaltered, some recent innovations in the field promise certain additional advantages over the existing methods for the preservation of museum specimens. Biological specimens form a separate category by themselves in that they differ radically from other categories of museum objects such as antiquities and works of art with regard to their preservation. The basic structure of the biological material itself presents inherent properties which make them susceptible to decay and deterioration that occur at a rapid pace. Forms and shapes which are often exquisite in the natural condition in plants and animals no longer remain the same after life has ceased to exist in them. Decomposition brought about by various factors such as autolysis, enzymatic reactions, fungal attacks etc. proceed almost incessantly after the death of the organism. Therefore, the task of preserving biological specimens call for special care and attention.

Alcohol and Formalin

Plant and animal specimens have been preserved by naturalists by various methods for a long time. These methods include dry and wet preservation. The chemicals used for the wet preservation are formalin and alcohol in their required percentages and this has been of universal application. Very little changes have been brought about in their use ever since Robert Boyle introduced alcohol as an anatomical preservative as early as 1663 and Blum recommended Formalin as a preservative for animals and plants in the year 1893. Both formalin and alcohol have their own advantages as well as disadvantages. Dry preservation had often meant the dehydration of the specimen as a whole or removal of the internal organs and stuffing them as in the case of taxidermy. These methods of preservation though applied on a universal scale in museums of natural history, have very often failed to serve the primary aim of museum preservation, namely, the unaltered maintenance of external form and colour. In the case of liquid preservation both formalin and alcohol are notorious for their inability to preserve the natural colour of the specimens. Dry mounting of animals has also suffered much in the hands of unskilled craftsman. Many of the so-called 'taxidermists' have no background in animal behaviour or habitat and lack any knowledge of anatomical features of the animal, which are essential for the making of a taxidermist. Mere artistic abilities do not help him to become a good taxidermist.

Anaesthetics

The rough and ready method of plunging a specimen into a jar of alcohol or formalin has now been more or less replaced by more systematic methods to ensure the proper preservation of specimens. In the case of animals with soft, contractile bodies, the necessity for anaesthetising them with the use of narcotics like menthol, magnesium sulphate, chloral hydrate etc. in order to render the animal insensitive so that when killed they are not damaged by excessive contraction, has been widely understood. This process is followed by fixing with the help of fixatives such as Zenker's fluid, Bouin's fluid, Picric acid, Acetic acid, etc. as the case may be, to maintain the body tissue in a condition as near as possible to that of life.

Liquid Preservatives

In the use of liquid preservatives measures are now being taken to overcome the defects of formalin and alcohol. Neutralization of formalin with the addition of borax, hexamine, or calcium carbonate; addition of glycerine to prevent shrinkage of specimens; acetic acid for improved penetration of the preservative etc. are some of the cases in point. One of the fields of investigation that has not received adequate attention is that of finding out suitable methods for the preservation of natural colour in animals and plants. Many authors have recommended various copper salts for preservation of green colour in botanical specimens. Mixtures of formalin, acetic acid, alcohol and copper sulphate, solution of copper sulphate bubbled with sulphur dioxide, combination of acetic acid, copper acetate and alcohol and several such solutions are prescribed by many workers in this field. But these methods

have not been found to give satisfactory results in the retention of green colour in plant specimens.

Colour Preservatives

Of such methods, the one suggested by Butler (1918) has shown promising results under experimentation in our laboratory. This method consists of immersing the specimen in one per cent solution of sodium-bi-sulphate and adding citric acid till a strong odour of sulphurdioxide is produced. The specimen is then transferred to a 4 or 5 per cent solution of formalin. Perhaps a better attempt in evolving methods for the preservation of green colour in plants would be to study the chemical reaction of chlorophyll with various organic compound known to have a preservative function. Work on these lines have shown that chlorophyll structure is greatly impaired by the action of alcoholic solutions, weak acids and light. A method has recently been evolved in our laboratory for the preservation of green colour in plant with the use of sodium arsenite which has already been reported. The method consists of immersing the freshly collected specimens in a solution of 5% sodium arsenite for two weeks and then transferring them to 1% solution of sodium arsenite prepared in 5% formalin. Hessler has recommended a solution containing Zinc chloride, formalin, glycerine and water for the preservation of coloured fruits. Similarly zinc sulphate is recommended as a colour preservative for fungi. Various other chemicals such as copper chloride, glacial acetic acid, uranium nitrate etc. are also being used for the preservation of colour in plant specimens. Leaf skeletons are being prepared by boiling the leaf in a solution of sodium carbonate, calcium carbonate and water.

In the liquid preservation of zoological specimens also the problems of colour retention require extensive studies. So far we do not have any method which can be said to be satisfactory for the purpose. A study of the nature and reactions of various colour pigments which vary greatly in their composition and properties such as solubility, reaction towards acids, alkalies etc. would help throw more light on this problem and its consequent solution. This is a field which has received very little attention. Some of the work oriented in this direction was undertaken in our laboratory which has lead to the finding that sodium arsenite could also be used for the purpose or colour retention in certain groups of animals.

A 5% aqueous solution of sodium arsenite was found to preserve the red colour of crustaceans (a carotenoid pigment known as astaxathin), mainly in marine prawns and lobsters. Red, orange and yellow colours of most fishes are again due to the presence of carotenoid pigments and it was found that red colour in most of the fishes could be preserved in a 3% solution of sodium arsenite prepared in 10% formalin. Yellow colour in fishes, amphibians and reptiles can be satisfactorily preserved with a solution of sodium arsenite (3 gms) alcohol (20 cc.) glycerine (5 cc) and distilled water (75 cc). Black colour in animals, due to the presence of melanin pigments is far more stable than the red and yellow colours. They are

insoluble in organic solvents, but unstable in alkaline solutions. Properly neutralised formalin with additions of small quantities of glycerine is better than an alcoholic solution for the preservation of black colour. Careful regulation of the pH can play a great role in preserving colour when specimens are preserved in formalin. Experiments are also in progress to use certain enzymes for the preservation of natural colour. The British museum (Natural History) reports about the possibility of using Ethylene glycol as a substitute to alcohol, for the establishment of which further research is required.

Dry Preservation

In the dry preservation of biological specimens, the preparation of herbarium sheets for botanical specimens, skinning and stuffing of animals (taxidermy) etc. still occupy a major role though recently methods and techniques such as embedding, infiltration of specimens in synthetic resins, freeze drying etc. have brought about considerable progress in the processes of dry preservation. Embedding in synthetic resins provides opportunities for preparation of excellent museum specimens of delicate biological specimens such as meddusae, worms, tadpoles, embryoes of animals and similar fragile and delicate botanical specimens. The principle of embedding lies in the use of cold setting synthetic resins which on polymerisation become transparent plastic blocks within which the specimen is permanently protected. The specimen to be embedded is first cleared with some suitable clearing agents such as ceder-wood-oil or xylol and preserved in oil of winter green or glycerine. The clearing agent is then removed using carbowax (a synthetic water soluble wax) or similar substances which later on is removed by infiltration with the prepolymer solution. Embedding is then done much the same way as paraffin blocks of tissues are made for purposes of microtomy. A box like mould is prepared by cementing together strips of plexiglass, a first layer of the resin is poured and allowed to polymerise upon which the specimen is kept and the rest of the resin poured in several stages. As the resin sets at room temperature embedding the specimen within it, the strips of plexiglass are removed, and the plastic block is subjected to surfacing and polishing.

Polyester Resins

Some of the polyester resins that are found to be suitable for plastic embedding are Marco resin S.B.26 and Selection 5026. Sills and Couzyn have reported the use of selection for embedding biological specimens in the American Museum of Natural History. Till very recently synthetic resins of the above quality were not available in India and work on the embedding of biological specimens with synthetic resins was not possible. Now with the production of a polyester resin known as Hylak Polyester resins there is an opportunity to try this material for the purpose of embedding. Work in our department has shown that embedding could be done with the above resin and satisfactory results have already been achieved. A Prepolymer, a catalyst and an accelerator are supplied. Using a correct

proportion of these chemicals, carefully adjusting the room temperature and supplying a small quantity of heat from an electric bulb and taking measures to prevent cracking during polymerisation are some of the points that require careful study and experience. One of the chief advantages of embedding, apart from the facilities for handling etc., is that the colour of the specimen is better preserved particularly in comparison with liquid preservation as in embedding the pigments do not have the opportunity to interact with a chemical solution.

Synthetic Resins

Another remarkable method of preserving biological specimens is a process of infiltration with synthetic resins. This is a unique method of dry preservation applicable to specimens that are not suitable for embedding such as large biological specimens, whole brains, alimentary canal and organs of the digestive tract etc. Small specimens of reptiles, amphibians and fishes can also be preserved by this method, where taxidermy fails to do a satisfactory job. The process consists essentially of fixing the specimens in a fixative such as Formol-alcohol, dehydrating it by placing in a bath of carbowax, removal of the wax by passing through Xylol baths and finally infiltrating it with metha-crylate ploymer resin. The metha-crylate is dissolved in Xylene in which the specimen is immersed for about two weeks, preferably under vacuum. The specimen after removal is drained, coated with a plastic spray and dried. The method with suitable modifications can be prefected with hylak polyester resins also.

Freeze-Drying Method

One of the most recent innovations in the preservation of zoological and botanical specimens which may have a profound effect on methods as practised in natural history museums and which may well mean a revolution in museum techniques is the preparation of specimens by the method of freeze-drying. This extremely novel and interesting technique devised by Dr. H. T. Maryman of the Naval Medical Research Institute, Maryland is capable of replacing the classical methods of taxidermy in the preparation of museum specimens. Freeze-drying, dehydration from the frozen state has been devised after a great deal of research and experimentation. The essential process consists of freezing the specimen and posing it by fixing the joints with the use of liquid nitrogen and then placing the specimen in a deep freeze where it is allowed to remain for several hours. The specimen is then taken out of the freezer and dried. Drying is done in a chamber maintained at low temperature say, 10° C and at low pressure created by a vacuum. The vacuum may also contain a chemical dessicant for the purpose of removing water. The time taken for drying depends upon the size and weight of the specimens varying from four of five days to two or three weeks in the case of vertebrate animals and less than a day for invertebrates like spiders, insects etc. Such freeze dried specimens require the usual protection from insect pests and other factors of deterioration. Colourations of the animals general-

ly survive well after freeze drying. There is vast scope for further experimentation in this fascinating method of preservation which will yield very satisfactory results for the preservation.

Use of Enzymes

Of the miscellaneous advancements made in the field of preservation and preparation of biological specimens mention may be made of the use of enzymes such as papain and pancreatin for the preparation of vertebrate skeletons, clearing and staining vertebrate skeletons *in situ* by the use of Alizarin red, use of arsenical compounds and highly efficient repellents and deterrents for the preservation and protection of specimens and so on. Advanced methods such as plastic embedding, infiltration, freeze-drying etc. have now made is possible for the natural history museums to preserve and display biological meterials very efficiently so as to serve the purpose for which they are installed. The preservation of natural history specimens is an interesting field of work where there are endless possibilities to devise newer and effective techniques.

O. P. Agrawal

In the museum of today a well-equipped laboratory can play an important role not only to preserve the collections but also to study and to understand the material and its technical development. Conservation of museum—material has two aspects one is to stop or to retard the process of deterioration of material due to natural causes like atmosphere, light etc., and the other, which is generally termed restoration, is to cure or to treat the material for any alteration or disease that might have set in the object. The science of matter suggests the precautions to be taken to stop deterioration of museum objects. The general museum-staff incharge of the collections, by following these principles, can maintain the objects in a good condition. On the other hand, for actual cure or treatment of a 'disease' in the object, help of experts is required. In a museum, its laboratory provides this service. To

retard the deterioration of museum objects both these aspects have to be taken into account.

Deterioration Factors of Art Objects

Deterioration means a loss in value or defacement of an art object, it may be due to the effect of:

a. Climate.

b. Physical and Chemical Agents.

c. Biological Agents.

d. Mechanical Causes.

Climate

Climatic conditions or the environment have profound effect upon the preservation of an object. Tropical climate is worst for the maintenance of any material in good condition. It is favourable to the growth of micro-organisms and gives rise to moist conditions. Sudden changes in the equilibrium of atmospheric conditions is a factor, probably most harmful to art objects.

Physical and Chemical Agents

(a) **Light.**—Light, natural or artificial is a sure cause of destruction of material. Organic material—like textile, manuscripts, leather, paintings—is affected even by indirect lighting. Light hastens the chemical deterioration of these objects. On a dyed textile, the effect of light is two-fold, first the chemical deterioration of substance and second the fading of colours and dyes.

Studies indicate that the day-light is more harmful to delicate susceptible objects than the artificial light is. Susceptible material includes water-colour paintings, paints, etchings, manuscripts, rugs, laces, textiles, ivories, paintings done in vegetable colours and feathers. All such objects should be exposed to light as little as possible and that too to only indirect lighting.

(b) **Heat and Moisture**—In the context of the upkeep of art objects it needs mention that high temperature as such is not injurious except for its inter-relation with humidity. Humidity in a given space is correlated to the temperature; and for the safety of objects humidity must be controlled. High moist atmosphere accelerates certain deleterious chemical reactions which cannot take place in dry atmosphere. High moisture also gives rise to bacteria, fungi, insects and other organisms harmful to the objects. In wood, rise or fall of humidity sets in strain and stress in the structure which ultimately leads to gradual destruction of the material.

(c) **Atmospheric Pollution**—Impurities present in the air like sulphur-di-oxide, hydrogen sulphide or oxides of carbon present a real hazard to the art objects. These impurities of atmosphere are more concentrated in the industrial areas and in the places near the sea.

Biological Agents

Fungi and insects are deadly enemies of art material. In the open, stone sculptures get covered with green moss and mildew. These biological growths are not only disfiguring but harmful also to the stone. Environment being suitable, fungi attacks most organic material. Insects can be very damaging to wood, paper, textiles, leather etc. It is, therefore, imperative that all organic material is checked periodically and is kept supplied with suitable insecti-

cides. The storage cup-boards should remain clean and well-charged with a fumigant type of insecticide. Whenever an outbreak of insects is suspected or detected, the material should immediately be segregated from other collections and an expert consulted for fumigation treatment.

Mechanical Causes

One last factor of damage to the art object, paradoxical though it may seem, is the man himself. Probably more harm is done to an art object through human agencies than through any other cause. Most of us must have wached with horror the writings and scratchings done by the human hands on the walls of our ancient monuments, sculpture and paintings. The damage that can occur to a painting through the hands of a pseudo-restorer can be more devastating than through the normal course of deterioration. Careless handling during exhibition, storage or transport have brought more harm to the art material than anything else. What is the way out to bring to an end to this type of damage except inculcating a sense of respect, love and feeling for the art and the beauty that is inherent in an antiquity?

Functions of the Laboratory

A museum laboratory, for an effective preservation scheme, must have (1) an education programme to make the museum staff in charge of the collections conscious of the factors responsible for the deterioration of matter and (2) a conservation programme to treat the museum material.

To implement the first, lectures, demonstrations and publications should be arranged. The training, to be systematic, should include information about agencies of deterioration, their effect upon matter, the precautions that a museum should take for safe storage, exhibition and handling of objects, elementary conservation techniques, methods of examination etc. For the second programme viz., conservation, a laboratory—the clinic of the conservators where diagnosis is done and the prescription written—is required. For the examination of an object, and the diagnosis of the disease the conservator to-day has at his command a series of equipment. Macro- and micro analytical laboratory, X-Ray equipment, ultra-violet and infra-red photography, stereo-microscope are only a few of the aids that a well-equipped laboratory engaged in the conservation of museum material will require. The methods available for conservation of material require to be constantly improved.

Schemes to find new methods of dealing with the deterioration of material should be on the active programme of museum-laboratory. This involves long-term research projects dealing with material, its surroundings, their inter-action and the effect of chemical methods on the corrosion products.

Techniques and Art Contents

A museum laboratory also makes a study of the physical material of an object. An art object can be studied with respect to the art-content and can also be studied with respect to the material used to produce that object and the technique used to manufacture it. Appreciation of an art-object can be manifold if the step by step

background of the technique that has been employed to form the objects is also known. Conservation being a specialised science, one requires several years' training to be fully equipped to treat an art-piece. The museum-laboratory should have a scheme to train suitable persons in conservation work.

Functions of Museum Laboratory

The main functions of an ideal museum laboratory, can thus be summarised as follows:

1. To have an educational programme for the curatorial staff.
2. To give conservation treatment to the objects.
3. To have a research programme to improve upon the existing methods of conservation.
4. To study the physical nature and the technical history of an object.
5. To impart training for future conservators.

Organisation

A smooth run and efficient out put can be expected of a laboratory only if it has been organised systematically keeping in mind all the major obligations that it has to fulfil. The work must be divided into several sections. These can be: 1. Scientific and Research department. 2. Conservation department. 3. Photo-department. 4. Training department.

Scientific and Research Department

This department for its working should have a chemistry laboratory, a physics laboratory and a biology laboratory. The laboratory should be equipped to be able to perform micro as well as macro chemical analysis, preparation of micro-sections, chromatography, photo-micrography and metallographic analysis. Micro-sections permit study of materials and their structure under the microscope. For identification of pigments micro-chemical analysis is very useful. In more recent times spectrography and X-Ray diffraction has found a permanent place in good museum laboratories for identification of material. Chromatography helps in the investigation of resins and binding media. The metallographic analysis equipment is essential to enable a study of the problems of manufacture of metallic objects. Material is identified by chemical methods or spectrographically.

In the physics laboratory much useful information can be had regarding the extent of deterioration by using a stereoscopic microscope. The photo-micrographic apparatus can reveal details of surface incrustations, structures and craquelures. It can study the relative positions of paint layers, protective coatings and later restorations. To help in the examination of paintings the ultra-violet rays (shorter wave lengths), infra-red rays (longer wave-lengths), X-Rays and sodium vapour light are invaluable tools. The use of ultra-violet rays depends upon the difference of fluorescence caused by them in similar looking materials. Ultra-violet rays can help distinguish extent of later retouchings in a painting. The infra-red rays have a capacity to penetrate dark, translucent varnish and many pigments. Photographs done with their aid may reveal artist's

changes in the drawing, decipher covered writings and show repaintings. X-rays help in deciding the extent of core of material in a metal object, and the damage in a painting. X-rays penetrate through entire paint structure and can reveal the resin covered by over-paintings. Sodium vapour light, because of its property to penetrate yellowed varnish, can render details not visible to the naked eye.

The biology laboratory can help in the study and control of biological growths like fungus, insects etc., on museum material.

Conservation Department

This department will have to take the bulk of the work of the museum laboratory *i.e.* to provide conservation treatment to the museum collection. Obviously, in its search for the treatment to be given, it has to be guided by the scientific department. The work in this department can be divided according to the chemical classification of the material. Chemically, the museum material can be divided into four main groups:—1. Metals 2. Stones, ceramics and glass 3. Organic matter like wood, ivory, hair, bone etc. 4. Paintings. (Paintings owing to their complex structure are placed in a separate group).

There can, therefore, be four sections of the laboratory to look after the conservation of museum objects. For efficiency in conservation, as in any other technical profession, it may always be preferable to let the staff specialise in specific fields. It gives them competence, proficiency and confidence in their respective spheres.

The section of conservation of paintings can be further divided under several groups, if the load of work demands this. These groups can be (a) Paintings on paper (b) Paintings on wood (c) Oil paintings (d) Wall paintings.

The conservation department will also require the services of a small work-shop.

The laboratory also keeps a record of the work done by way of examination and conservation on all the objects that enter the laboratory. Their condition, before and after treatments, the examination report, the history of the methods followed have to be recorded faithfully. It is useful to have past history if the 'patient' pays a second visit to the 'hospital.' The radiograms of the paintings, photographs and other relevant information may be filed systematically for future reference.

Photo Department

The utility in a laboratory of photography using special techniques like ultra-violet rays, infra-red rays, X-rays etc., has already been discussed above. To keep a record of the condition of an object, and step by step history of treatment, help of photography is required. Words can never be substituted for a pictorial record. This documentation of works of art undergoing treatment supplements all written records. Both coloured and black and white reproductions are helpful.

Training Department

Conservation is a very specialised subject to-day. The person who is to take up the operation in the laboratory must have a thorough knowledge and practice of the processes involved. It will be extremely

hazardous to enturst the valuable art-pieces to ill-trained or self-trained restorers or conservators. Only constant practice under suitable guidance can impart a professional competence to the conservator. In our country the problem is of a vast magnitude, and has an urgency, which in the better interests of cultural heritage, cannot be postponed for long.

The apprentice conservator should be provided with a comprehensive theoretical education and practical training. The principles of physics and chemistry, art history and art criticism are to be his guides. He must develop an eye for detecting a flaw. It takes a long time and constant efforts to accomplish it. There ought to be a definite curriculum including both theoretical and practical education. An informal apprenticeship system is often uncertain. We cannot be sure of results; in fact, we are never sure what we are aiming at.

The syllabus of such a school or training centre has to be drawn with care taking into consideration the different aspects of conservation. The field of conservation itself is so vast that all that is not directly related to the subject should find no place in the syllabus. It is a specialised subject and should be treated as such.

The course of training may give instruction in the undermentioned subjects:

1. Methods of construction, composition and technology of an art object.
2. The nature of material used.
3. How the material deteriorates—the alteration products.
4. Methods of examination.
5. Preventive methods of stopping deterioration.
6. Technique of treatment of affected pieces of art.

Writing in 'The Problems of Conservation (Report on Progress in International Co-operation, ICOM, 1950) Sir Philip Hendy "expressed the hope that in the future the greatest possible number of restorers would undergo systematic training and that the government of each country would establish travelling scholarships for this purpose at properly qualified schools of restoration. Also that, with the aid of bursaries, different countries should exchange restorers for training courses; so that knowledge of their different methods could be shared." Needless to say the recommendations of the ICOM are yet to be fully implemented and much remains to be achieved.

It is only by having an efficient programme of conservation that a museum can be said to be truly fulfilling its duty towards the objects that are entrusted to its care. Already much that was the product of the creative urge in man has been destroyed through wars, loots, indiscriminate destruction, fire, wheels of time and ignorant human hands. Whatever remains is just a tiny portion. If this valuable small portion of our heritage remains neglected and uncared for, the day will not be far when it will perish altogether from the face of the earth.

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