Teaching and Research in Art Conservation

A university and a foundation join forces to help save our cultural heritage.

Rutherford J. Gettens

In a mansion on Fifth Avenue in New York City, home of the Institute of Fine Arts of New York University, the seed of a new idea has been planted, and it has taken root. The seedling is the new Conservation Center for art, which has been set up under a Rockefeller Foundation grant to train specialists who will be qualified to look after the physical welfare of cultural objects in museums and private collections.

Widely recognized as one of the most valuable segments of our cultural heritage is the art represented by paintings, drawings, sculpture, and other artifacts which has been bequeathed to us by past generations. Actually, only a small portion of the riches of the past has survived. Much has been destroyed by fire, earthquake, flood, war, and rebellion. A small residue and a precious one is left, but that is threatened by the most inexorable agency of destruction of them all—time itself, and slow decomposition. What disaster has spared, time may eventually destroy.

Fortunately, interest in art and its conservation is on the increase. Where formerly art collecting, exhibition, and preservation were left to private collectors, they are now being fostered by governments. The upsurge of nationalism the world over has made nations conscious of their past. In countries that formerly gave little heed to their cultural heritage there is now great pressure to establish museums, to promote archeological excavations, and to preserve ancient monuments. The present drive of the United Arab Republic to save the art treasures and monuments of ancient Egypt now threatened in Nubia by the proposed Aswan Dam Project on the upper Nile is a good example.

International Center

The problem of art conservation is so widespread and so urgent that UNESCO has taken cognizance of it to the extent that it has created in Rome an International Centre for the Study of the Preservation and Restoration of Cultural Property (*1*). Harold J. Plenderleith, chemist and former head of the British Museum Laboratory, has been made director. The purpose of the center is to survey the needs for art and monument protection all over the world; to collect technical information, to encourage education of conservation specialists, and to coordinate the research of museum laboratories. The Rome center is cooperating with the International Council of Museums, another UNESCO affiliate, in organizing and coordinating the work of museum conservation specialists. It is admitted that one of the greatest problems of the Rome center will be that of finding trained specialists who will actually do the work of preservation; finding specialists is perhaps the bottleneck the world over. There are countless problems. Apathy is slowly being overcome, money will eventually be forthcoming, but men with knowledge and know-how must be found. This is where the New York University Conservation Center can play a key role.

Early Practices

Formerly the treatment of works of art, especially of paintings in museums, was a casual matter. It was carried on at first by artisans from outside sources, later by staff employees. To quote William Boustead (*2*), conservator of the Art Gallery of New South Wales, these "were men of the old carver-gilder, picture-cleaner, craftsman type whose methods of restoration of pictures consisted of deep cleaning with 'spirit of wine' and turpentine, varnishing with copal resin and, worst of all, the pernicious habit of oiling out canvases with linseed oil. These tacky layers picked up dirt, dust, and mold spores, provided rich nourishment for mold growth and formed [over the picture] a tough leathery linoxyn skin which is now impossible to remove. Foxing of prints and drawings was removed with chloride of lime; drawings pasted down with flour paste and canvases lined with animal glue." Boustead paints an accurate picture. Such practices are no longer tolerated in the larger museums, but, unfortunately, they continue in some art dealers' and picture framers' private shops and among certain commercial restorers. This situation is clearly described by Sir Philip Hendy in the foreword to the catalog of an exhibition called "Cleaned Pictures," which was held in London in 1947 (*3*). He tells of the struggle that has been going on at the National Gallery, London, for over a century to preserve the 2000 paintings of that collection.

There were small beginnings towards a change in attitude in the 19th century. The first to recognize the need for a new approach to art conservation were officials of some of the larger European museums. The State Museum in Berlin established the first museum laboratory, in the late 1880's. The laboratory of the British Museum for Research in Conservation was installed in 1919, first under Alexander Scott; later it attained world-wide recognition under Harold J. Plenderleith. A little later the Museum of Antiquities at Cairo was set up under the chemist A. Lucas, whose name is still a by-word among Egyptologists. The establishment of a laboratory at the Louvre followed, in 1925. Another milestone in art conservation was reached about 1930 when the Department of Conservation was created at the Fogg Museum of Art, Harvard University. Modest scientific equipment was gathered at the Fogg Museum, and a definite program of research in the theory and practice of art conservation was initiated. The Fogg Museum became known especially for its pioneer publication, *Technical Stu-*

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dies in the Field of the Fine Arts, edited by George L. Stout, now director of the Isabella Stewart Gardner Museum in Boston. This journal did much to "increase and diffuse knowledge" in art conservation widely over the world. In the 1930's more museum technical laboratories were established: at the Museum of Fine Arts, Boston; the Metropolitan Museum of Art, New York; the Courtauld Institute, University of London; the National Gallery, London. Also in that decade the Belgians made museum laboratory and conservation history when they established, in Brussels, the Central Laboratory of the Belgian Museums (now l'Institut Royal du Patrimoine Artistique de Belgique), which has become world-famous under its energetic chemist-director, Paul Coremans. In the early 1940's the Istituto Centrale del Restauro was set up in Rome to give technical guidance for preservation of the rich patrimony of Italian art.

The author is shown examining vermilion-painted characters on a Chinese pottery urn of the type called *lien*, which was made about the 4th or 3rd century B.C. [Courtesy Freer Gallery of Art]

Government-Supported Programs

Most of these museum laboratories of foreign countries are government-supported and staffed by civil service employees. Some of them, including the British Museum and the National Gallery, advise, and to a limited extent render services to, provincial museums and even to private collectors. They accept an active responsibility for preserving the art treasures of the nations they serve (*4*). The ministries in Portugal, India, Japan, Canada, Poland, Yugoslavia, and some other countries are giving support to art conservation. In the United States, about the only government-supported art conservation is that carried on by the National Park Service. In taking over and operating historic sites, especially the historic houses of the East, the Park Service found it had assumed a considerable responsibility in the way of protecting art collections. The rich collection at Independence Hall, Philadelphia, of portraits of persons prominent in the founding of our Republic is an example. The Park Service had to set up a special conservation laboratory for care and treatment of these paintings. The Smithsonian Institution, also government-supported in part, is taking steps to establish a conservation department to look after its vast cultural holdings.

Another big event in art conservation was the incorporation under British Law, in 1950, of the International Institute for the Conservation of Historic and Artistic Works (called IIC). Its purpose has been to set professional standards in art conservation and to promote diffusion of knowledge of conservation methods, principally through its journals. The institute has two classes of membership: fellows, who are mostly professional conservators, museum laboratory administrators, and museum scientists; associates, who are interested laymen who want to keep in touch with the field. The institute publishes *Studies in Conservation* (edited at the National Gallery, London), *IIC Abstracts of the Technical Literature in Art and Archaeology* (edited at the Freer Gallery of Art, Washington, D.C.), and *IIC News* (London). The institute, which now has over 600 members in 49 countries, gets most of its support from members and private institutions and a little from foundations (*5*).

Work of Private Institutions

A few institutions in this country, using private funds, are also carrying the torch for conservation and technical studies in art. In the early 1950's the National Gallery in Washington, through grants from the Old Dominion Foundation, set up a fellowship for research in artists' painting materials at the Mellon Institute in Pittsburgh. Intensive research on protective coatings for pictures is carried on there by Robert Feller. As a result, the natural resin varnishes formerly used for coating pictures, which cracked and yellowed with time, are slowly being discarded for synthetic polymer coatings, which do not yellow and do not deteriorate so rapidly. At the Intermuseum Laboratory in Oberlin, Ohio, which is supported by several museums of the Midwest, procedures for the systematic examination and maintenance of whole art collections are being devised (*6*). In 1951 the Freer Gallery of Art inaugurated its Laboratory for Technical Studies in Oriental Art and Archaeology. This laboratory is mainly equipped and operated as a chemical analytical laboratory where studies on the materials and construction of ancient Chinese bronzes, ceramics, paintings, and other artifacts are made (*7*). Similar activities are going on in the Walters Art Gallery in Baltimore, the Isabella Stewart Gardner Museum in Boston, the University of Pennsylvania Museum, and elsewhere.

What the art museums in this country do is, at best, largely governed by practical demands in conservation, and the same is true, by and large, abroad. They are occupied with the care of their own collections, and even this activity is mostly limited to emergencies as they arise. They do not find themselves in a position to undertake investigations that are broad in scope, or to

maintain courses of academic instruction in the field. Hence, at best, their contribution to the advancement of knowledge and the raising of standards in art conservation is slight. At worst, their chief interest, like that of art dealers, is in restoration rather than conservation—in obscuring damage and making objects look whole and attractive for exhibition, not in preserving them for the future.

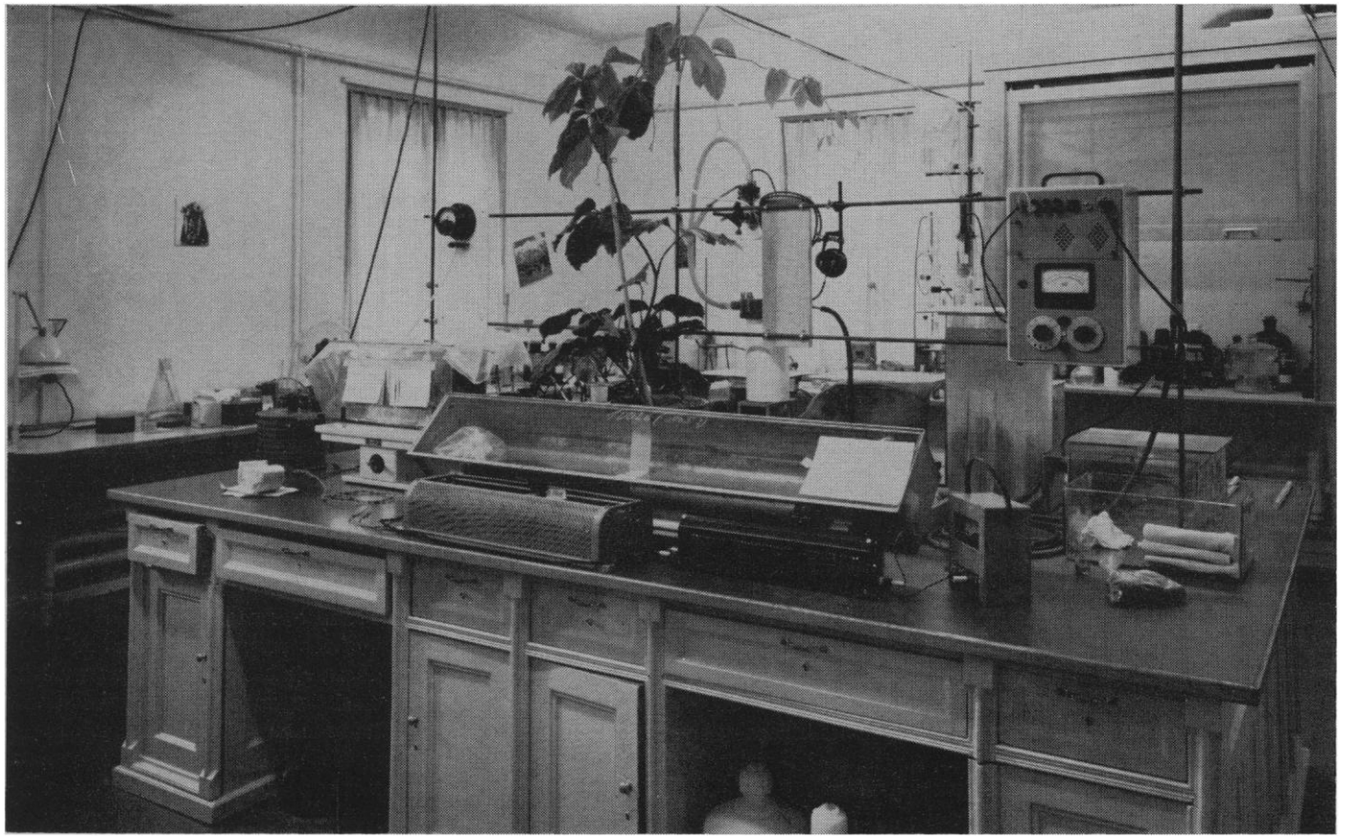
Role of the Private Foundation

The private foundations are beginning to be aware of the need to conserve our cultural heritage. In 1957 the Eli Lilly Endowment sponsored a conference on "Protective Coatings" at Oberlin College, Ohio, under the guidance of Richard D. Buck. This meeting was attended by some 50 curators and conservators, and it eventually led, in 1959, to the publication by the Intermuseum Conservation Association of a 220-page report, *On Picture Varnishes and Their Solvents*. In 1959, also, the Rockefeller Foundation sponsored a conference (and publication) on "Application of Science in the Examination of Works of Art," held at the Museum of Fine Arts, Boston, under the chairmanship of William J. Young, director of the Research Laboratory of the museum. That same year the Rockefeller Foundation also gave support for an "Exploratory Conference on Art Conservation" at the Brooklyn Museum. This conference, organized by the late Edgar C. Schenck and by Caroline and Sheldon Keck, director and conservators, respectively, of the museum, was attended by museum directors, curators, scientists, and foundation representatives, and the discussions paved the way for the grant later made by the Rockefeller Foundation for the support of the Conservation Center at New York University.

It may be seen from this account that space, equipment, and money are being made available to rescue our vanishing cultural heritage. The main problem is to provide trained individuals to use the tools that are being provided. Most of the conservators and administrators of museum laboratories are self-trained. Some got their training under a sort of apprentice system. Several are scientists with advanced degrees. There are many dedicated and capable people in the field. The time is rapidly approaching when professional training in conservation must be made available. The field is becoming so important and the problems are so vast that universities must provide men with the professional training and stature that the job requires. Unfortunately, except to some degree at the Courtauld Institute, University of London, research and practice in museum conservation are nowhere associated with regular university courses in the fine arts.

Conservation Center

To fill this need for trained manpower is what the new Conservation Center at New York University aims to do. The Rockefeller Foundation grant will support the center entirely for five years, then the grant will taper off, and after another five years the center will have to find other means of support. Nearly the entire basement (formerly the kitchen and service areas) of the James B. Duke house at



The Swiss National Museum in Zurich has recently established a large laboratory with modern scientific equipment. This is a small pilot plant for studying a method for preserving wet wood from archeological excavations with Carbowax. [Courtesy Swiss National Museum]

Stephen Rees Jones, lecturer-in-charge at the laboratories of the Courtauld Institute of Art in London, is shown with students removing the paper facing from a painting which has been reinforced with a new canvas by means of the original relining equipment developed in the institute laboratories. [Courtesy Courtauld Institute of Art]

1 East 78th Street, home of the New York University Institute of Fine Arts, has been given over to the Conservation Center. During the past summer this basement was extensively remodeled to provide a large student workroom, a chemical laboratory, an x-ray laboratory, a workshop, and three offices. Scientific instruments and equipment include a modern x-ray machine, a 3-meter Jarrel-Ash grating spectrograph, various microscopes, a chemical balance, and chemical glassware. There are also a source of ultraviolet light, a sodium lamp, and infrared photographic equipment. The equipment will be used by the staff in conducting research dealing with materials and methods of art conservation. It will also be used by the more advanced students. In the beginning, problems of an *ad hoc* nature will be worked on. These will include uses of iron-55 isotopes in examining low-density materials such as paper and tissues; use of polyacrylonitriles as adhesives and surface coatings for paintings; and spectrographic identification of trace elements in ancient Chinese bronzes. Later, problems of long-range importance, such as that of preserving Oriental paintings on silk and paper, will be tackled. This is an especially urgent problem because there are thousands of irreplaceable Chinese and Japanese paintings in American collections and no one now has the proper knowledge and skills to prevent them from deteriorating and ultimately disintegrating.

In setting up the Conservation Center in the fall of 1960, the officials of New York University ran into the very problem they are trying to solve for other institutions—that of procuring a top-flight staff for research and instruction. The program calls for a resident teaching staff in both conservation and science. Lawrence J. Majewski, experienced in the conservation of both easel paintings and wall paintings, is the conservator, with the title of research associate, lecturer, and administrator. George L. Stout, mentioned above, commutes periodically from Boston to New York to aid in the work of the center. A board of consulting fellows, consisting of Stout (chairman), Murray Pease (head of the Conservation Department of the Metropolitan Museum), Edward V. Sayre (chemist, Brookhaven National Laboratory), and me, sets policies, establishes programs, and evaluates the students' work. Sayre will have the position of Scientist for the first half of the first year, and Robert L. Feller of the Mellon Institute, for the second half. The appointment of a permanent Scientist has not yet been made.

Training

In the fall of 1960, five graduate students were accepted for training. Prerequisites were some undergraduate courses in design, courses in drawing and painting, and some acquaintance with the physical sciences (the equivalent of at least 12 credit hours). Under the program, as set up, the students were enrolled in three history of art courses in the university and, as part of their training in conservation, they were enrolled also in a new course called Materials and Examination of Art. This course provides systematic instruction in the properties and classes of art materials, including stone, ceramics, metals, paints, pigments, and organic support materials such as wood, fabric, and paper. It also provides for systematic study and reporting on objects made from these materials. In the second year, after they have completed more courses in art history and in materials of art, the students can qualify for an M.A. degree in art history. In the third and fourth years the students who wish to become professional conservators will take special courses in museology and connoisseurship, arranged through the cooperation of the Metropolitan Museum. They will be given, also, advanced instruction in the materials and construction of art objects, in environmental influences, and in the practice of conservation. At the end of this period students can qualify for a diploma in Conservation of Art.

The purpose of the training program

of the Conservation Center is to turn out not only professional conservators but also a new type of curator with a fundamental knowledge of materials and structures of works of art, with some experience in applying conservation techniques, and with a thorough grounding in history of art—all on the graduate level. Curators with this special background will eventually fill positions of responsibility in our larger museums, where the care and maintenance of collections is as important as their interpretation. Those who complete the four years of training and qualify for a diploma in Art Conservation will be in demand to head museum conservation laboratories, which are becoming more numerous and more important all over the country. Others may find private work in conservation more interesting and lucrative. Private conservators will have the task of caring for the vast cultural holdings still in private hands. Their work will be as important as that of workers in museum laboratories. Like university graduates in the established professions such as medicine, engineering, and the military services, graduates in art conservation may find that their specialized training qualifies them for varied careers. There is little doubt that the standards set by this university-level training program in art conservation will raise conservation standards all over the country. We may look forward to the establishment, on the basis of such foundations, of minimum professional requirements and even to state licensing for art conservators. Men trained in the Conservation Center of New York University will have an influence with museum administrators that artisans could never have achieved. They will help frame policies and introduce practices that will extend the life of cultural objects many hundreds of years.

References and Notes

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3. P. Hendy, in "An Exhibition of Cleaned Pictures (1936–47)" (National Gallery, London, 1947).
4. Some idea of the interest in conservation of art in Europe is given in R. J. Gettens, *Museum News* **39**, 23 (Dec.–Jan. 1960–61).
5. *Endeavour* **9**, 163 (1950).
6. R. D. Buck, "An Experiment in Cooperative Conservation," *Studies in Conservation No. 2* (1956), pp. 101–109.
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Sarsen Stones of Stonehenge

How and by what route were the stones transported? What is the significance of their markings?

Patrick Arthur Hill

The concentric stone circles of Stonehenge, England, consist of two main types of stone, bluestone and sarsen. Both have been transported many miles from their original outcrop areas, the bluestones from the Prescelly Hills 140 miles to the west (*1*), the sarsens from the chalk Downs 21 miles to the north. To date, the bluestones, because of the greater distance transported, have received the greater attention, although the sarsens are larger and several times heavier.

Sarsens, in their natural state, consist of large blocks of silicified sandstone that lie at certain localities on the Downs. The nearest outcrops to Stonehenge are shown in Fig. 1, and there is no evidence to suggest that the stones—some weighing as much as 50 tons—were moved to Stonehenge by agencies other than human. The problem is, how and along what route were the stones transported? At the time of movement, in the early Bronze age (about 1500 B.C.), there were supposedly no wheels in Britain, no beasts of burden, and, other than rawhide, no rope (*2*).

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Route

In the only study of the transportation problem to date, Atkinson (*3*) suggested that the Stonehenge sarsens originated on the Marlborough Downs, because the largest outcrops occur there today. According to him, selected sarsens were dragged to Avebury, "blessed," then dragged one at a time on sledges over hardwood rollers to Stonehenge. To avoid the steep descent of the chalk escarpment, Atkinson swings his route westward to cross the Vale of Pewsey at its narrowest point (see Fig. 1) and, using this route (*3*, p. 115), calculates that the 81 sarsen stones were moved one at a time at an average speed of a half mile a day and that the task occupied 1500 men for 10 years. Later (*4*) he suggested that the *minimum* hauling party for the heaviest stone would have been 100 men most of the way and 450 up Redhorn Hill. These figures are for the haulers only and do not include the additional men required to shift the rollers and steer the sledge.

Despite the advantages, there are six objections to Atkinson's route. (i) The labor requirements are large. (ii) The route is 4 miles longer than necessary. (iii) A surprising number of sarsens outcrop south of the Kennet; many admittedly are smaller than those on the Marlborough Downs, but this may simply mean that the larger stones have been removed. (iv) Avebury does not lie on the direct route to Stonehenge. (v) It would be easier to have the stones blessed *in situ*. (vi) The ascent of Redhorn Hill is unnatural and unnecessary, and more than negates any advantage of the detour.

A possible alternative route (*5*), based on field work undertaken during 1958, is suggested in Fig. 1. It has the following advantages. It is shorter than Atkinson's route and is essentially downhill for 17 of its 21 miles. It would account for the pebbles of opalescent quartz found in some of the Stonehenge sarsens, because opalescent quartzes occur in sarsen outcrops at Lockeridge (*6*), which is on the route. It also connects with the Stonehenge avenue at Amesbury, and there is thus