Fundamental principle for preventive conservation of photograph collections
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Carl Linnaeus, that great collector and classifier, said, "If you do not know the names of things, the knowledge of them is lost too." To identify and name something in order to understand it - to give it a date, to inventory it, to preserve it; these are the essential procedures for photographs collection. The dilemma facing us with regard to photographs is that while we want to study, handle and display them, these are the very actions that may leave them damaged or even destroyed. While we are often unable to reverse the damage that has occurred, we may be able to slow future deterioration by observing some simple principles of sound conservation practice. The following advice aims to draw attention to the fragility of photographs and to the kind of care that will help to preserve them. Photographs are prone to damage in unsuitable environmental conditions – temperature, humidity, light, air quality, storage materials – and by poor handling. The deterioration may be chemical in nature (hydrolysis of paper, oxidation of silver), physical (breakage of glass, tears in paper) or biological (mold infestation, pests). Physical and biological damage may produce sudden and obvious damage; rapid response might be required to limit the damage. Chemical deterioration processes are generally slower acting, proceeding irreversibly and continuously but, perhaps, imperceptibly. When the damage becomes apparent, it is too late to act against it. Looking at old photographs we often see them yellowed or faded and assume that such changes are inherent and inevitable; but, in fact, such changes can be largely, or completely, avoided by proper conservation measures.

Environmental conditions

Many deterioration processes can be slowed, or even halted, if environmental conditions are adjusted to levels optimal for conservation. Thus we have many examples of historic photographs made more than one hundred years ago that have survived in excellent condition due to good storage environments. On the other hand we can also find examples of relatively modern, more inherently stable photographs that, due to high temperature and/or high humidity, have quickly and disastrously deteriorated. Temperature and humidity are critical environmental factors and there are specific standards established for the storage of photographs. They specify various temperature / humidity ranges for storage of various types of photographs. Since there is not one common set of environmental conditions suitable for all photographs, it becomes necessary to specify conditions for specific media and support types (color, plastic support negative, glass plates, etc.). Such arrangements represent significant costs for the establishment, operation and maintenance of conditioned storage facilities. Large collections that have important artistic or heritage value cannot escape the investments required for ethical custodianship of their material. The effort must be to establish a storage location that is cool and dry. Cool but humid environments, such as basements, are to be avoided, as are dry locations that experience wide temperature variations, such as attics. For the storage of a mixed photographic collection, the adage to follow is "moderation in all things". Relative humidity between 30% and 40% is suitable in most cases. Sudden and large fluctuations in humidity should be avoided since these can cause deformation, cracking and delamination. Relatively inexpensive dehumidification units are available that function automatically and with minimal maintenance. But before committing to any particular environmental control strategy, collection custodians should consult with an expert in preventive conservation to assess the requirements of the particular situation and to propose a

variety of clear aims and options to achieve them. Black-and-white prints on paper may be kept at room temperature (21°C, 70°F) as long as sudden and large fluctuations are avoided. Most color photographs (prints and transparencies) as well as most negatives on plastic film (cellulose nitrate and cellulose acetate) must be kept at low temperature if they are to be expected to be kept for a period longer than 100 years. As a rule of thumb, lowering the storage temperature by 10°C increases the life expectancy of the most vulnerable photographs by a factor of three. Large photograph and film collections have invested heavily in low-temperature storage facilities. Smaller collections and those with limited funds have installed ordinary frost-free freezers and use strict packaging protocols to protect the material inside the packages from damage by frost and condensation.

The material and the form of the ideal storage envelope depend on the particular application. Polyester has the advantage of allowing the document or image to be seen without removing it from its enclosure; it is probably the best choice for photographs that are frequently accessed. Otherwise, paper is preferred since it does not seal the photograph hermetically but allows for a gradual equilibration and buffering of humidity. In the specific instance of nitrate negatives, paper sleeves avoid the accumulation of damaging gasses inside a sealed airspace, as may happen with plastic sleeves. The paper must be carefully chosen so that it will not damage the silver-based images of black-and-white photographs by releasing harmful gasses. Such paper is often referred to as acid-free paper; that is, it is not acidic nor will it become acidic as it ages. Poor-quality acidic paper will itself deteriorate and may cause deterioration of photographs in close contact. Suitable paper is chemically stable, made from cotton fibres or from bleached wood pulp, and must have an alpha-cellulose content of at least 87%. It must not contain any lignin, dyes, waxes or metallic particles nor any materials that are likely to damage the photograph by diffusion or through decomposition. It must contain no chemical impurities such as free sulfur or peroxides. And its sizing must be either neutral or rendered basic by the inclusion of an alkaline reserve. It is often better to choose a paper with an alkaline buffer – one that has a basic pH rather than neutral or acidic. The incorporated alkaline material – usually calcium carbonate – acts to preserve both the paper enclosure and the photographs housed within. But pH is not the only measure of suitability. The qualities of papers suited for storing photographs are listed in two documents from the International Standards Organization, ISO 18902 and ISO 18916. The latter standard incorporates the Photographic Activity Test (PAT), a very specific pass/fail test that ensures that the storage material will not itself harm the photograph. In order to advertise their products as being suitable for storing photographs, manufacturers must guarantee conformity to these standards.

Boxes that are designed for storing photographs must be made from materials that will not damage their contents. Acceptable construction materials are conservation-quality cardboard, metal coated with heat-cured finishes, and rigid plastics such as polypropylene, polystyrene, or ABS. Wood storage cabinets - whether they are made of solid wood, plywood, or with an engineered wood product - should be avoided if possible. To a greater or lesser degree they will all emit (or "off-gas") volatile organic compounds (VOCs) that may damage photographs. Metal shelving and cabinets are the preferred option. Plated steel, anodized aluminum, or steel coated with a heat-cured finish or with a cured epoxy paint are all good materials for metal storage furniture. Cured epoxy finishes are particularly resistant and emit no solvents. Most metal office furniture currently available is finished with heat-cured finishes that will meet the requirements for conservation of photographs.

If there is no alternative other than existing wood storage units, photographs should be carefully enclosed in envelopes and boxes before being placed in drawers or on shelves and should never be in direct contact with a wood surface.

Display

Light exposure can damage photographs, especially photogenic drawings, albumen prints, platinum prints, cyanotypes, and even some daguerreotypes. Gelatin silver prints are generally much more resistant to light-induced damage, although poor processing treatment may leave them vulnerable to light and the optical brighteners incorporated in recent gelatin silver papers may be "extinguished" by large light doses. Chromogenic process prints are considered quite light fugitive, although since 1990 the light stability of some papers has greatly improved. As for the "digital output" ink jet prints, although they were generally prone to rapid light fading in the first years of the new technology, manufacturers have recently brought out new generations of ink sets and substrates that are believed to equal the light stability of current chromogenic process papers. Photographs should never be hung facing a window; rather, they should be placed in darker locations and lit with well-controlled artificial light sources. If repeated use or extended exposure risks damaging a print, copies or facsimiles should be substituted for the original. Such copies cannot entirely replace the experience of viewing an original but, when they are carefully and accurately made, they will satisfy most of the need for access and display. Such copies may be made by the original process, by conventional copying on contemporary silver-based materials, by digital imaging, or by a combination of techniques. The institutions that hold important photograph collections have adopted some rules for exhibition of photographs that may be useful indicators for anyone who has photographs they value. First is to use only low intensity illumination on photographs: from 50 – 300 lux (5 - 28 foot-candles) as measured by an appropriate illuminance meter (luxmeter) with very low ultra-violet (UV) content. UV rays are invisible - and thus do not contribute to our perception of the image - but they are particularly damaging to vulnerable images. The UV content of natural light is particularly high but it is also elevated in light from some artificial sources. Natural light sources are inherently difficult to control and are to be avoided in favour of controlled artificial sources with UV filters. The UV content of tungsten halogen or fluorescent lamps should be filtered out to a level below 75 microwatts per lumen. Even using low intensity filtered illumination, photographs cannot be displayed indefinitely since the damaging effects of light are cumulative. Photographs that are particularly light fugitive can only be displayed for short periods of time before being returned to dark storage. This will make it possible for a future generation to see them in something approaching their original condition. The best way of quantifying the light exposure received by a photograph during a display period is to calculate the accumulated light dose. This is done by multiplying the illuminance (lux) by the exhibition duration (hours); the result is the light dose in lux-hours. Several conservation publications have recommended specific light dose limits for particular types of objects. These must necessarily be understood as order of magnitude approximations since every photograph has its own history and inherent characteristics that will render it more or less vulnerable. Photographs thought to be stable have sometimes shown signs of rapid deterioration when exposed to light, while others have exceeded the exposure threshold without the slightest sign of fading. This problem, which arises from the diversity of objects and the uncertain nature of their light sensitivity, is not limited to photography. Research is currently being conducted to develop a method for evaluating the sensitivity of specific objects.

Основные принципы превентивной консервации фотографических материалов
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1. Вступление.

Изучение, обращение и выставка фотографий может привести к повреждению и даже к полному разрушению фотоматериалов. Выполнение некоторых простых

принципов превентивной консервации может замедлить неизбежное разрушение фотографий. Основная опасность – неподходящая внешняя среда (температура, влажность, свет, качество воздуха, качество материалов для хранения и мебели, обращение). Виды разрушений: химическое, физическое, биологическое.

2. Окружающая среда

Многие разрушительные процессы могут быть замедлены и даже предотвращены если окружающая среда в которой находятся фотоматериалы (в хранении или на выставке) соответствует оптимальным показателям. Температура и относительная влажность являются критическими факторами окружающей среды, для фотографий разработаны особые стандарты их значений. Важно учитывать специфику отдельных видов фотоматериалов для которых оптимальны разные значения температуры и влажности (цветные фотографии, негативы на пленочной основе, негативы на стекле и т. п.). Хранителям следует консультироваться со специалистами по превентивной консервации для выработки оптимальных условий хранения в каждой отдельной ситуации и для создания четких целей и путей для их выполнения. При выборе материалов для хранения, упаковки и мебели также должны учитываться особенности различных фотографических техник и уровень их задействования в музейной деятельности. Международные стандарты.

3. Выставка

Светочувствительность различных материалов. Разрушение фотографий, вызванное светом. Правила для выставки фотографических материалов. Уровень освещения и ультрафиолета, рекомендации. Различные виды освещения – разный уровень ультрафиолета. Как вычислить уровень облучения полученного фотографией на выставке. Реставрационные публикации с рекомендациями по уровню освещения для различных видов фотографий.