THE CARE OF OLD CEMETERIES AND GRAVESTONES

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THE ASSOCIATION FOR GRAVESTONE STUDIES

I. THE PROBLEMS

THE IMPORTANCE OF OLD GRAVESTONES

More and more people are coming to realize that gravestones are one of the most beautiful and distinctive forms of American expression. Several books and dozens of scholarly articles have been published on gravestone topics, primarily within the past twelve years. In general, however, gravestones have not attracted as much public attention as more portable antiques, which have grown in monetary value and scholarly esteem through constant trading on the art market. Nor have they yet any economic value as tourist attractions, so they have not aroused the interest of governments in the way that Europe's cathedrals and monuments have recently spawned a number of nationally funded research projects.

THE SERIOUSNESS OF THE PROBLEM

The deterioration of gravestones and graveyards is becoming increasingly evident. In Connecticut alone the beautiful and unique portrait of a child illustrated as a full-page plate in Allan Ludwig's 1966 *Graven Images* (plate 12),[1] is now completely destroyed; another important stone in East Hartford (Ludwig, plate 192B) has recently lost half of its face; the well-known Amasa Brainard stone (Ludwig, plate 202) is in imminent danger.

In addition to the natural weathering of stone, it is thought that growing industrial and automobile pollution may be causing some types of stone deterioration to increase at an ever faster rate, so that the next several decades may see as much damage as has occurred in the previous 200 years.[2] Estimates of the rate of loss of old gravestones in various parts of the Northeast vary widely, ranging from 1 to 5 stones per year per thousand stones[3,4] to 30 stones per year per thousand[5].

CONSERVATION VS. RESTORATION

There are no easy answers to these alarming problems, and before pursuing them further, it may be useful to discuss briefly the philosophy of modern conservation.

Conservation is a relatively recent discipline, one which is just beginning to extricate itself from the ignorance, alchemy, and secret recipes of previous decades. Known as *restoration* until fairly recently, *conservation* is favored in modern use because it emphasizes the preservation of the original object rather than its restoration, which in the past often meant trying to make it look new. The number of qualified art conservators is not large, and the number of stone conservators is even smaller, consisting of only a handful in the United States. Although there is a professional organization of conservators--the American Institute

for Conservation of Historic and Artistic Works[6]--there is, at present, no licensing body. Thus, anyone may call himself a conservator and set up business. Most responsible professionals favor word-of-mouth referrals by respected colleagues as the best way to select a conservator. This system is far from perfect and is open to charges of elitism, but it may be the best answer for the present. The Conservation Committee of the Association for Gravestone Studies serves as a clearinghouse for information relating to gravestone conservation by maintaining contact with American and international experts.

In an ideal world, all old gravestones would receive the same kind of care as do valuable museum objects. However, their great number, outdoor location, and other factors preclude such treatment in the immediate future.

Therefore, priorities for treatment should be determined. A major question is whether some of the best early stones should be moved indoors for safekeeping. This was suggested as early as 1938,[7] and the idea has been recently revived. There is, however, a philosophical conflict between preserving the integrity of individual gravestones as art objects, and preserving the integrity of a cemetery as a collection of memorials made for that location. This question will be discussed later in this article.

It cannot be emphasized too much that old gravestones are important enough to deserve the best efforts of modern conservation, including serious consideration of all possible alternatives, consultation with the best experts available, and caution appropriate to navigating in uncharted waters.

POLITICAL CONSIDERATIONS

It is extremely important to seek permission from the governing authority of a cemetery before contemplating any conservation activity. Of course, jurisdiction over cemeteries varies. Only one state, Rhode Island, has a full-time Cemeteries Director with the authority to act for the preservation of old gravestones. Through his efforts, the state legislature recently passed an act which requires each city and town to record the locations of all historic cemeteries on a tax plat or other permanent record. Such records will be valuable aids to researchers. Moreover, the act may prevent some of the abuses which have occurred occasionally in other states, where cemetery land has been appropriated for other purposes and the stones dispersed.

State laws may sometimes inhibit local initiatives unless legal changes are sought. For example, the Gloucester, Massachusetts Community Development Corporation found that Massachusetts laws, in an effort to protect the stones, strictly prohibit their removal from cemeteries. As part of a restoration project this group worked for the passage of an Enabling Act which permits community sponsored, professionally directed teams to temporarily remove monuments for repair, while insuring adherence to high standards of technical assistance and treatment.[8] If legal changes are necessary in other states to conform to modern conservation practice, similar groups or individuals should petition for changes.

COMMUNICATIONS

Since interest in old gravestones and knowledge of stone conservation are recent developments, poor communications often prevent their paths from crossing. For example, a well-meaning New England town council recently appropriated money for the treatment of a cemetery by an amateur. Any professional conservator could have advised the council that the proposed treatment would almost certainly do more harm than good. Again, it should be emphasized that the best advice should always be sought. Experts, both here and abroad, have expressed their willingness to advise the Association for Gravestone Studies on specific problems, but interested individuals at the local level must initiate the chain of communications.

II. WHAT CAN BE DONE?

The magnitude of gravestone conservation problems requires the interest of a great number of people if anything is to be accomplished. Individuals can help, first of all, by promoting interest in gravestones. Raising interest on the local level will increase the potential for the funding of projects, because federal or state conservation grants must usually be matched by town councils or other local groups. Secondly, individuals can educate themselves and others with regard to the problems of conservation.

IMPROVING MAINTENANCE

Simple maintenance is an important first step in the conservation of any graveyard. Well-kept cemeteries tend to discourage vandalism. Uncontrolled growth of trees and weeds not only hides loiterers or vandals, but can cause the widening of cracks in already damaged stones, or even cause the toppling of stones. For example, large, unpruned trees have been known to destroy several gravestones with the fall of a single dead limb. The regular repair of fences and mowing of grass will emphasize to members of the community that their old cemetery is an important part of the town, and a well lettered sign can underscore the point.

Power mowers, when carelessly used, have scarred and broken old tombstones; maintenance personnel should be made aware of both the importance of the monuments and of the fact that the types of stone used in old gravestones are softer and more easily damaged than are modern granite markers. If possible, the grass growing closest to old gravestones should either be clipped by hand or cut with a rotating plastic filament-type cutter which will not damage the stones. An English book suggests keeping sheep in the churchyard to keep grass short! A more practical solution may be reseeding with a variety of grass which does not grow so tall that it needs frequent cutting.

Improving visibility of a graveyard from the road or illuminating it at night are reported to decrease vandalism.[10] Citizen's complaints to the police, if a graveyard is a hangout for destructive juveniles or derelicts, can also help. In extreme cases, cemeteries have been fenced and locked by local authorities; this may, however, keep out scholars and the interested public without deterring vandals.

DISCOURAGING THEFT

If interest in gravestones continues to rise, outright theft may eventually become as serious a problem as vandalism. Already, there are rumors of antique dealers looking for gravestones to sell, and a few have appeared on the market. Even if the stone was removed from its original site many years ago, the private ownership of an old gravestone is ethically questionable, and every effort should be made to determine the origin of the stone and to effect its return. The AGS Archives at the New England Historic Genealogical Society in Boston may be able to assist in such efforts. The raising of public consciousness should not be underemphasized; for example, a proposed auction of some privately-held gravestones recently aroused such public outcry that the sale was cancelled and the stones donated to a museum.[11]

ESTABLISHING RUBBING/DAUBING CRITERIA

The practice of making gravestone rubbings has aroused controversy, notably at the 1976 Dublin Seminar.[12] Some communities and the entire state of New Hampshire have restricted rubbing to those who have obtained a permit. Ideally, such legislation should also require that the applicant demonstrate competence in the acceptable rubbing technique before being given a permit. Such steps have been taken because of an increasing number of incidents where stones have been defaced by careless applications of wax or ink. A very serious example of such accidents has occured in Columbia, Connecticut; the Lydia Bennitt stone (Ludwig, plate 244), one of the most beautiful marbles in New England, has been disfigured, perhaps permanently, by a black ink-like substance, presumably applied by a person using an Oriental style wet ink rubbing technique.

Persons taking rubbings from gravestones must understand that stones differ in their fragility. While a sound stone can be rubbed with perfect safety, many are so delicate that touching the surface could cause the detachment of a major portion of the design. Connecticut Valley sandstones are particularly susceptible to damage from handling, but every stone should be examined carefully before rubbing. If cracks can be seen, if a hollow sound is heard when the face of the stone is tapped lightly with the back of a fingernail, or if grains become detached when the stone is rubbed with the fingertip, the stone should not be rubbed.

Even greater caution should be exercised in making three dimensional castings of gravestone designs. Casting materials which might penetrate or stain a stone, or release compounds which could eventually discolor and become insoluble, such as vegetable oil aerosols like *Pam*, should never be applied to the surface of a gravestone.

Enforcing rubbing standards is difficult for municipalities, especially since most rubbings are done on weekends, when offices which issue permits and offer advice and guidelines are closed. Therefore, the task may be left largely to word-of-mouth transmission by interested individuals.

RECORDING DATA

Since gravestones are going to continue to deteriorate and be lost, the single most important service that an individual or group can do for an old cemetery is to carefully record everything that remains. The AGS article, *Recording Cemetery Data*,[13] outlines steps which can be taken by a local group. Documentation should incorporate both a written record and archivally processed black and white photographs of every gravestone, fragment, and fieldstone. Black and white photography is preferable to color photography for visual recording because color slides and photographs fade; rubbings tend to be more subjective than photography. Not only will photography record the appearance of stones, but it will also serve as future evidence of their rate of deterioration. The deposition of copies of cemetery records with the AGS Archives in Boston will enhance the value of the archive for both art historians and conservators.

The dictum that *nothing should be thrown out* is an important principle of modern conservation. In the case of cemeteries, even fragments of stones, however illegible, can provide clues for future investigators. They should be photographed, their locations carefully recorded, and they should be labelled and deposited for safekeeping. In particular, fragments of identifiable origin should be put into plastic bags with labels and kept for that day in the future when repairs can be made. Cemetery custodians and interested groups or individuals can do a great service by saving such broken pieces, which will crumble to bits in a very short time if they are allowed to remain scattered about the yard, to be run over by power mowers and otherwise carelessly treated. Often an adjacent church or a local historical society is a convenient repository. Interested parties should, of course, check state laws and talk to local authorities before removing any fragments from a graveyard. A special warning is warranted concerning unmarked fieldstones. These were often used as grave markers during the earliest periods of settlement and should be recorded and preserved as carefully as carved gravestones.

CONSERVING TILTED OR FALLEN GRAVESTONES

If a gravestone is tilting so that it is in danger of falling over, or if it has already fallen, it should be reset in an upright position. Stones which are tilted or lying flat are more liable to be damaged by lawnmowers. Deterioration may be accelerated because they will collect rainwater and absorb moisture from the ground.[14] The temptation to straighten a tilted stone by force, without digging out the soil around it, must be resisted, for the stone may snap off at the ground line.

Some communities have set stones in concrete to prevent tilting and theft. This has several major disadvantages and probably should not be recommended. A gravestone set in concrete has no "give," and is more likely to snap off at the base if pressure is exerted, maliciously or otherwise. Also, soluble salts in a poor quality cement may migrate up into a porous stone such as sandstone, forming efflorescences and accelerating deterioration. To a certain extent, this may be mitigated by careful choice of cement. For example, on the recommendation of the Portland Cement Association, a low alkaline content cement was used to set stones at Trinity Churchyard in New York; this seems to have produced no ill effects on sandstone

markers after several years. Perhaps the most important disadvantage of setting stones in concrete is that they cannot be removed afterwards for conservation treatment, such as washing to remove salts, or impregnating with a consolidant. Better than setting a stone in concrete is placing it in alternate layers of soil and a mixture of sand and broken stone (1/2-3/4" sharp-edged gravel), periodically wetting the earth as it is applied. This base will not prevent theft, but even concrete will not prevent a thief from snapping off and taking the thinner stones.

If a gravestone is broken so that there is insufficient shaft to reset the stone, it might be leaned against the back of another stone; this, however, may invite theft. In the past, important fragments were occasionally encased in granite or concrete, and the new structure set in the ground. A less drastic solution, perhaps more respectful of the integrity of the piece, might be to erect a copy of the stone (identified on the back side as a replica) and place the original indoors for safekeeping.

Documentation of treatment by both written records and photography, before and after treatment, is an important conservation practice. Not only will this document the appearance of a gravestone at a certain time, but it will provide evidence of the efficacy of different types of treatment after weathering and aging.

REMOVING LICHEN

The benefits of lichen removal are debatable. Lichens *do* produce acids which can, on a geological time scale of thousands of years, eat into stone, especially marble and limestone. On the other hand, the wholesale removal of lichen, particularly from weakened stones, has considerable potential for harm. A professional stone conservator could determine the advisability of lichen removal in specific cases, and eventually AGS may be able to provide this expertise. In the absence of such advice, examination techniques, as discussed under *Rubbing*, should be employed to insure that the stone is in good condition. If it is secure and the removal of lichen is necessary to photograph or read an inscription, the safest method is to soften the lichen with water and gently remove it with a plastic brush or wooden stick. Dilute ammonia solutions, excluding proprietary ammonia/detergent mixtures, have been recommended by some experts; others believe they might cause eventual harm, especially to porous stones. Formaldehyde (formalin) and several commercial products have also been recommended for killing lichens.[15] Because research in this area is inadequate, an appropriate spirit of caution should be adopted.

III. MAJOR TREATMENT

A great deal remains to be learned about the deterioration and treatment of outdoor stone objects. Although only substances commercially available in the United States were tested, a 1977 National Bureau of Standards publication concluded that "None of the stone preservative materials evaluated fulfilled all the proposed performance criteria."[16] Furthermore, the author stressed that "When choosing a stone preservative for a specific stone decay problem it is essential to identify the cause of decay."[17]

The identification of the cause of decay is difficult, and therefore may be expensive, because of the complexity of stone deterioration. Causes of deterioration can include pollutant gases and acidic rainwater, soluble salts which repeatedly crystallize and dissolve depending upon the relative humidity, and freeze/thaw cycles, as well as other factors which are only in the initial stages of investigation.

Another significant cause of deterioration is previous restoration, a fact which should temper present treatments. For example, the application of a surface consolidant to a stone which contains soluble salts will probably *accelerate* deterioration because salts may crystallize beneath the surface and cause large pieces of the surface crust to fall off. The British Commonwealth War Graves Commission used a sealer on some 500,000 gravestones between 1920 and 1951 and found that those which had been treated were generally in worse condition than those which had not.[18] Application of consolidants impermeable to water has likewise caused exfoliation because water rising from the ground or absorbed from uncoated surfaces tends to build up behind the consolidated layer. The application of high strength substances, such as epoxies, for the consolidation of weak, porous stone has caused shearing at the strong/weak interface. Furthermore, cements or mortars, traditionally used for securing detached pieces, have often been found to become unstuck. Iron has often been used for supports or braces in the past, but it can stain stones badly, or, if used as internal dowels, crack a stone by expanding as it rusts.

Some types of epoxies and other resins have shown promise as stone adhesives, and field tests have been carried out on a number of slate gravestones in New England. In the near future, it is hoped that there will be enough evidence to allow the results of these trials to be published, and specific materials and procedures recommended.

The problems connected with porous stones, such as sandstone, are more complex than those of non-porous stones like slate. For example, if a porous stone contains soluble salts, it may need to be washed in tanks of water for up to several months in order to remove them. A major difference stems from the nature of deterioration; sandstone binder tends to dissolve and cause general weakening of the stone fabric, whereas slates tend to separate strictly along bedding planes. Therefore, porous stones such as sandstone, marble, and limestone may require general consolidation. Various types of silicate compounds have been under investigation for a number of years as consolidants for porous stones, and some show considerable promise.[19] However, even these can be dangerous if improperly applied.[20] Complete impregnation with plastics, such as methyl methacrylate, has also been advocated.[21] These types of treatment are expensive, because of the cost of the materials and the labor involved, and they have other disadvantages. Treatment with silicates may have to be repeated approximately every twenty-five years. The stability of methyl methacrylates has been questioned, and they may alter the stone's appearance slightly.

For the present, a sensible approach to the conservation of deteriorating gravestones must recognize the importance of: 1, consultation with a number of experts regarding causes of deterioration and possible treatments, and 2, small-scale trials, on actual tombstones, of any type of treatment which is proposed. This may seem extremely difficult and frustrating to those who love old gravestones, see them deteriorate daily, and are eager to do

something. But the sad lessons of the past must be heeded. Josef Riederer writes: "Particularly in the period before 1940 many buildings and sculptures in Germany were treated with oils, waxes and similar substances which at that time had already been tested out for a fairly long period. But today after 30 years we find that this treatment was harmful, because the objects are destroyed to a greater extent than those which were untreated."[22]

This raises again the question of whether some of the most important and most fragile American gravestones should be put, at least temporarily, into museums. The legal ramifications of removal will have to be worked out, but there are precedents elsewhere. On the Scottish island of Iona, many of the great stone crosses and gravestones, some of which had stood in the same place since the ninth century, have been moved indoors to an "infirmary museum." A bronze plaque politely explains to visitors that the measure has been taken to prevent the complete destruction of the stones. In Canada, resin and fiberglass replicas of some important early wooden grave markers have been erected; the replicas are almost indistinguishable from the originals, which are now in a museum. A start in this direction is being made in New England, where at least two gravestones have recently been brought indoors and replaced with cement casts made by William McGeer.[23] In the past, monument firms have occasionally arranged for the cutting of replicas in stone, but in this case, the quality of the copy depends upon the skill of the stonecutter.

It is hoped that this publication, which is of necessity general in content, can be revised to include more specific information, such as lists of recommended conservators or tips on state or federal grants. To this end, the author and AGS welcome any and all information about conservation projects, problems, and successes. Readers are also strongly urged to get in touch with local museum conservators, who will often give valuable advice, or recommend others who can, if they are made aware of the importance of old gravestones.

There is much that *can* be done at present and it will take a great many interested people to help the spread of information and to generate support for the small or large research projects which will pay dividends in the future. European countries are already investing large amounts of money and personnel for very sophisticated work on stone conservation problems, and it is hoped that five or ten years' time will see substantial progress.

The most useful function which the Conservation Committee of AGS can play at this time may be to serve as a clearinghouse for information on cemetery conservation. A dream for the future is for federal, state, or local funding which would permit the organization of a national or international team of specialists to analyze the causes of gravestone deterioration and conduct field tests of possible solutions to the problems.

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NOTES

1. *New England Stonecarving and Its Symbols, 1650-1815* (Middletown: Wesleyan University Press, 1966).
2. Erhard M. Winkler, in *The Conservation of Stone I,* Proceedings of the International Symposium, ed. R. Rossi-Manaresi (Bologna: 1976), fig. 2.
3. Gaynell S. Levine, "Colonial Long Island Gravestones and Trade Networks," (M.A. thesis, SUNY-Stony Brook, 1978).
4. "Stone Rubbing: Are Model Laws Needed?," *Puritan Gravestone Art,* the Dublin Seminar for New England Folklife: Annual Proceedings, vol. 1, ed. Peter Benes (Boston: Boston University Press for the Dublin Seminar, 1976), p. 102.
5. Peter Benes, "The Restoration of Burying Grounds: the Viewpoint of Gravestone Artwork," *Journals from the Gloucester Experiment: A School Community Partnership Project* (New England Program in Teacher Education, 1974), p. 10.
6. AIC publishes a *Journal* and *Newsletter.* For information contact Martha Morales, Executive Secretary, 1522 K Street, N.W., Suite 804, Washington, DC 20005.
7. Marion Nicholl Rawson, *Candleday Art* (New York: E. P. Dutton, 1938), p. 63.
8. Coit Butler, "Laws, Regulations and Procedures Governing Historic Cemeteries," *Journals from the Gloucester Experiment: a School Community Partnership Project,* pp.23-29.
9. Rev. Henry Stapleton and Peter Burman, *The Churchyards Handbook: Advice on their Care and Maintenance* (London: CIO Publishing, 1976), pp. 55-56.
10. Peter Benes, *The Masks of Orthodoxy* (Amherst: University of Massachusetts Press, 1977), p. vii.
11. "Stone Rubbing," p. 103.
12. *Ibid.,* pp. 92-105.
13. A model publication is *The Old South Hadley Burial Ground,* ed. Jessie Lie (South Hadley Historical Society, 1976).
14. One author, however, feels that the opposite may be true of slate gravestones in Australia. See John H. Cann, "A Field Investigation into Rock Weathering and Soil Forming Processes," *Journal of Geological Education* (November, 1974), p. 228.
15. Norman Weiss, "Some Notes on Stone Conservation," *Journals from the Gloucester Experiment: A School Community Project,* p. 79; and Barry A. Richardson, "Control of Moss, Lichen and Algae on Stone," in *The Conservation of Stone I,* pp. 225-231.

16. Gerald A. Sleater, *Stone Preservatives: Methods of Laboratory Testing and Preliminary Performance Criteria* (Washington, DC: National Bureau of Standards, 1977), p. 29.
17. *Ibid.*, p. 21.
18. W. H. Dukes, "Conservation of Stone: Chemical Treatments." *The Architects' Journal Information Library*, 23 August, 1972, p. 434.
19. See K. Lal Gauri, "Conservation of Stone: A Literature Review," *Decay and Preservation of Stone*, Engineering Geology Case Histories, no. 11, ed. Erhard M. Winkler (Geological Society of America, 1978), p. 102.
20. Dukes, p. 434.
21. For example, Rolf Wihr, "The Use of Aethyl-Silicate and Acrylic-Monomers in Stone Preservation," *Deterioration and Protection of Stone Monuments*, Proceedings of the International Symposium June 5-9, 1978, 3 vols., (Paris: 1978), 7-12.
22. "Stone Preservation in Germany," *Conservation of Stone and Wooden Objects: Reprints of the Contributions to the New York Conference on Conservation of Stone and Wooden Objects, 7-13 June 1970* (London: International Institute for Conservation of Historic and Artistic Works, 1971), p. 129.
23. William McGeer, 48 Harwood Avenue, Littleton, MA 01460, provided copies of the James Foster slate stone, 1681, Dorchester, MA, and the Sarah Nisbett slate stone, 1698, Milford, CT.

READING LIST

RECORDING

Farber, Jessie Lie, ed. *The Old South Hadley Burial Ground.* South Hadley, MA: South Hadley Historical Society, 1976.

Baker, F. Joanne; Farber, Daniel; and Giesecke, Anne G., "Recording Cemetery Data." See pp. 99-117 of MARKERS 79/80, vol. 1.

Jones, Jeremy, *How to Record Graveyards.* London: Council for British Archeology and RESCUE (The Trust for British Archeology), 1976.
Available from
Council for British Archeology
7 Marylebone Road
London NW1 511A
England

STONE CONSERVATION

Lewin, Seymour Z., "The Preservation of Natural Stone 1839-1965." *Art and Archeology Technical Abstracts*, vol. 6, n. 1. (1966), Supplement, 185-272.
Abstracts of all publications prior to 1966.

Conservation of Stone and Wooden Objects: Reprints of the Contributions to the New York Conference of Conservation of Stone and Wooden Objects, 7-13 June 1970. London: International Institute for Conservation of Historic and Artistic Works, 1971.
Available from IIC
608 Grand Buildings
Trafalgar Square
London WC1N5HM
England

Joint Committee for the Conservation of Stone. *The Treatment of Stone: Proceedings of the Meeting October 1-3, 1971.* ed. R. Rossi-Manaresi and G. Torraca. Bologna, 1972.
Available from the publisher
Centro per la Conservazione delle Sculture all 'Aperto
Via de 'Pignattari 1
40124 Bologna, Italy

International Symposium on the Conservation of Stone. *The Conservation of Stone 1: Proceedings of the Symposium June 19-21, 1975.* ed. R. Rossi-Manaresi. Bologna, 1976.
Available for $20 plus postage from the publisher (same address as the 1972 Bologna publication above).

International Symposium on the Conservation of Stone. *The Proceedings of the Second International Symposium on the Deterioration of Building Stone, Athens, September 1976.* Athens, 1976.
Available for $50, postage included, from
Laboratory of Physical and Applied Electrochemistry
National Technical University of Athens
Patission Str. 42
Athens 147
Greece

Winkler, Erhard M., *Stone: Properties, Durability in Man's Environment.* New York-Vienna: Springer-Verlag, 1976. $41.90.
A thorough, technical treatment of the mechanisms of stone decay.

Sleater, Gerald A., *Stone Preservatives: Methods of Laboratory Testing and Preliminary Performance Criteria.* Washington, DC: National Bureau of Standards, 1977.
Available for $2.30 from
Superintendent of Documents
Government Printing Office
Washington, DC 20402
A number of stone preservatives designated by code numbers only were tested by accelerated aging. This work is being continued at NBS.

International Symposium on the Conservation of Stone. *Deterioration and Protection of Stone Monuments: Proceedings of the International Symposium, Paris, June 5-9, 1978,* Paris, 1978.
Available for 350 French francs, postage included, from:
Centre Experimental de Recherches et d' Etudes du Batiment et des Travaux Publics (Messieurs Mamillan or Bouineau)
Boite Postale no. 1
78470 St. Remy les Chevreuses, France
74 papers, in English and French, by specialists from 27 countries.

Gauri, K. Lal, "The Preservation of Stone," *Scientific American* 238 (June 1978): 126-136.
A good brief introduction for the lay person.

Winkler, Erhard M., ed. *Decay and Preservation of Stone.* Engineering Geology History Case Histories, no. 11 n.p. Geological Society of America, 1978.
Available for $10 from
Publication Sales Department
Geological Society of America
3300 Penrose Place
Boulder, Colorado 80301
A good collection of recent articles, though not nearly as wide a selection as the Paris conference above.

CEMETERY CONSERVATION

Matthias, George F., "Weathering Rates of Portland Arkose Tombstones." *Journal of Geological Education* 15 (1967): 140-144.
Mechanisms of decay are briefly described, and an attempt made to measure varying rates of decay.

Dukes, W. H., "Conservation of Stone: Chemical Treatments." *The Architects' Journal Information Library,* 23 (August, 1972): 433-438.
The Commonwealth War Graves Commission reports that certain types of conservation treatment seemed to accelerate decay of gravestones.

New England Program in Teacher Education. *Journals from the Gloucester Experiment. A School Community Partnership Project.* Gloucester, Massachusetts: Gloucester Community Development Corp. 1974-5.
Available for $5 from
Gloucester Community Development Corp.
Box 15
Gloucester, MA 01930
An extremely important collection of articles on various aspects of a cemetery conservation project including legal, social, educational, and archaeological aspects as well as articles on landscape restoration and stone conservation.

Dublin Seminar for New England Folklife. "Stone Rubbing: Are Model Laws Needed?" *Puritan Gravestone Art: Proceedings of the Dublin Seminar 1976.* Dublin, NH, 1976: 92-105.
A transcription of a panel discussion which extends to many areas of conservation.

Stapleton, Rev. Henry and Burman, Peter, *The Churchyards Handbook: Advice on Their Care and Maintenance.* London: CIO Publishing, 1976.
Available from the publisher at 2.40
Church House
Dean's Yard
London SWIP 3N2
England
Intended for clergymen of the Church of England, this book is of limited interest to American readers. It was reviewed in the *AGS Newsletter* 3, no. 1 (Winter, 1979): 5.

Farber, Jessie Lie, "Recommendations for the Care of Gravestones." Association for Gravestone Studies, 1979. (Mimeographed).
Available for $1 from Rosalee F. Oakley, AGS Executive Director, 46 Plymouth Road, Needham, MA 02192.