

Stone in Historic Buildings:
Characterization and Performance

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Stone in Historic Buildings: Characterization and Performance

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Foreword

The scientific approach to stone conservation dates back to a few contributions from the second half of the 19th century when the practical aspects of cleaning, consolidating and protecting buildings were the main subjects of study and were certainly favoured over work to understand the causes and mechanisms of deterioration. The understanding of these causes and mechanisms is necessary to achieve durable success in the field. Such a situation continued during the following century, with a few notable exceptions in the 1930s when, in Great Britain and Austria, the significant effects of air pollution on building stones, and the intrinsic influences of the minerog-petrographic characteristics of lithotypes on their deterioration were investigated. But it was only at the end of the 1960s and in the following decades, with the repeated monographic Bologna meetings and the commencement of the International Congresses on the deterioration and conservation of stone, that the current, more rational, approach to the restoration of stone monuments was progressively established. The first of the International Congresses took place in 1972 at La Rochelle (France); the 12th and most recent one took place in 2012 in New York City.

These major meetings produced a wealth of useful information in their proceedings and were very often integrated with other meetings, such as those on the Conservation of Stone in the Mediterranean Basin; the next, and ninth, of the Mediterranean Basin symposia will be held in Ankara in June 2014. Several other more specialized and/or monographic meetings have addressed single aspects of deterioration or conservation of lithic materials, such as salt decay, the formation of oxalate patinas (the Milan conferences of 1989 and 1996), the decay of volcanic rocks and tufa, the methods of evaluation of the effectiveness of conservation products (Rome 1985), for example, and were accompanied by very useful volumes of proceedings. One should also mention the very many other colloquia organized on a regional scale, often of a very high quality and of the utmost interest, as well as the numerous miscellaneous books on deterioration and conservation of cultural heritage that collect contributions on many aspects of the sciences applied to stone materials.

The current volume adds to the ongoing development of the understanding of the various aspects of general and applied geology, chemistry, physics, and so on, of stone of diverse geographical origins and subject to various conservation

problems. This understanding is both a fundamental requirement for the effective application of conservation treatments and a near guarantee of the success of such treatments if applied correctly and effectively.

The mass of such contributions published on paper and/or online is now very impressive in scale, although it is often quite difficult for single individuals, especially in the less well developed countries, to remain up-to-date with the significant progress achieved.

In general, it is true to say that the overall knowledge of most of the phenomena involved in the physical decay and chemical alteration of stone in natural environments, and in the exterior and interior of monuments, has progressed significantly in recent years. The depth to which this knowledge has reached is, of course, variable: we know, for example, a great deal about limestones, marbles, sandstones and much less about breccias, granites and volcanic rocks. Our knowledge of conservation and maintenance materials and methods is also not totally satisfactory and much basic research is needed for several treatment materials. In the past, a few handbooks summarized contemporaneous materials and methods; these were most welcome and very useful. Unfortunately these are now all at least partially obsolete: updates of such volumes are necessary and it would be desirable to critically review and articulate the state-of-the-art knowledge and application of all aspects of stone deterioration and conservation.

Research in the sciences that encompass stone conservation has become highly interdisciplinary and complex in recent years, and before further real progress can be made, the general deterioration concepts, conservation methods, treatment materials and strategies (including programmed monitoring and maintenance) must be defined, understood and capable of application in all countries with a significant legacy of monumental architecture and statuary to preserve. Further coordinated research, scientific cooperation and basic communication between the disciplines and the scientists themselves must be promoted in order for conservation science to advance towards the best results. The results of such work should be presented so as to be easily understood by practitioners (primarily conservators and restorers) and widely disseminated.

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