B. C. G. SHORE

CONSERVATION OF VALUABLE BUILDINGS

We in Britain have suffered more than most from the hands of ruthless "restorers" because the country is, by long-standing and deserved reputation, often wrapped in fog and damp. Added to these conditions, no part is very remote and over a considerable proportion the damp air contains acid solutions from the products of combustion of solid, liquid and gaseous fuels.

The Industrial Age came early to us and the great added wealth which it brought to a naturally rich island happened to coincide with an out-burst of enthusiastic interest in Mediaeval buildings. It was unfortunately the case that the great and worthy inspirers of this interest were not the technicians who were allotted the work of restoration; these technicians were, alas, men brought up in the heart of towns and wedded to drawing-boards and paper rather than to nature and craftsmanship and our Churches, especially, but also some castles, have suffered from that deep scraping and cutting-back and refacing which lost them so much character.

The protesters against this lamentable assumption that industrial methods could reproduce, "as good as new", the work of mediaeval craftsmen had to find remedial measures, even beyond cleaning, in order to arrest the agents of decay, the forerunner and grand vehicle of which is always rainwater.

The early attempts in the nineteenth century (and a little beyond) were theoretically wrong and so quickly seen to do more harm than good that the whole idea of the conservation, rather than renewal, of stonework fell into disrepute and the authorities have tended to say "the stones are decayed, they are old and have had their day, they should be renewed".

Some of us believe that we can show that we now have materials which are demonstrably harmless and which can help us.

When I was young and an amateur a great chemist and physicist who was also an ardent follower of Ruskin and "The Anti-Scrapes" urged us to look in the direction of the element silicon and he inspired us as greatly as the master. Almost forty years ago Allbright & Wilson of Newcastle-upon-Tyne made up various solutions of silicon ester for me to use on buildings. These acted as binders for weakening stones (it will be remembered that all building stones consist of bits held together by binding-matters which are usually more soluble that the "bits").

At first we hoped the silicon esters would act to some small extent as water-repellents by altering the relative interfacial tensions of stones and water — but they never did. We have had to wait a very long time before the silicones were produced in sufficiently large scale to enable them to be used as water-repellents of masonry, the complement to the toughener which we have used, with some opposition from prejudicial parties, for a generation.

Fig. 1 - *A common problem. Decaying ancaster oolitic limestone. Granthan, Lincolnshire (England).*

Our creed for valuable buildings and other structures is *clean, then toughen with silicon ester, then check capillary action with silicones.*

Fig. 2 *A common problem. Dissolving caen oolitic limestone. Ewhurst, Sussex (From France).*

B. C. G. Shore

CONSERVATION DES EDIFICES DE VALEUR
RÉSUMÉ.

Afin de nous aider à augmenter notre compréhension des matériaux qui composent les structures précieuses, nous étudions leur composition, leur détérioration et leur décomposition et pour perfectionner nos efforts de conservation il peut-être utile de retenir les images mentales de ce qui se passe dans les éprouvettes et à travers le microscope. Les résultats sont lents, laborieux et saisissants mait précisément le spécialiste peut utiliser les images essentielles en mettant des repères où il veut. Le travail préliminaire du spécialiste peut-être expliqué rapidement.

Pour des raisons de clarté et de brièveté nous nous bornons ici à une série de pierres, les pierres oolithiques, fréquemment employées en Europe occidentale, des temps anciens à nos jours.

Ces pierres consistent, en totalité ou en grande partie, en de petites sphères ou sphéroïdes, de telle manière que ces « oolithes » sont assez grandes pour être vues sous un aspect assez semblable à celui de laitance ou d'oeufs de poisson.

La structure de chaque « oolithe » est concentrique ou radiale et faite de calcium (carbonate de calcium $CaCO_3$ *sur un noyau microscopique souvent de silice* SiO_2. *Ces sphéroïdes sont en grande partie reliées ensemble par de très minces plaques de calcium* $CaCO_3$, *et une petite plaquette de pierre sous le microscope ressemble assez à des boules surnageant sur une mare recouverte d'une fine glace.*

Les analyses de la pierre montrent environ 95% de carbonate de calcium qui est lentement soluble dans l'eau de pluie et plus violemment attaqué par la combustion des combustibles solides, liquides ou gazeux. Evidemment, les produits de parties se dissolvent vraisemblament en proportion de leur surface et de leur masse (les plaques les premières) en libérant les grains et en facilitant l'entrée ou l'infiltration de l'eau de pluie avec laquelle se formeront de nouvelles solutions qui en se recristallisant dans les pierres causent des pressions destructives.

La capillarité transporte l'eau (ou solutions) vers le haut et très loin à l'intérieur des pierres.