Laser Cleaning at St Georges Cathedral

PAYE Conservation try to keep up with the changing nature of building conservation and endeavour to use new proven advances in techniques where pertinent to do so. Laser cleaning is an area we see as being at the forefront of these new technologies and such we are keen to be leading practitioners in the field.

Recent trials were undertaken at St Georges Cathedral in Southwark to the friable limestone inscription panel attributed to Augustus Pugin (1812–1852), most famous for his work with Sir Charles Barry on the design of the rebuilt Houses of Parliament.

The frieze is of specific architectural importance because following the devastating bombing in April 1941 (when an incendiary device started a fire which destroyed the timber roof and much of the building) it remains one of very few examples of the original decorative works to survive.

The decay to the limestone has been exacerbated by the thick carbonation crusts which have developed on the surface (from airborne pollutants) preventing the stone from breathing and causing the limestone to break down significantly. In fact it was so soft that touching it with your fingers would cause it to disintegrate.
Laser Cleaning at St Georges Cathedral (cont’d.)

The stone needs to be consolidated, but really the crusts need to be removed before doing so. Trials completed using mechanical techniques; careful chiselling, the application of softening poultices and soft scrubbing all resulted in losses to the original fabric.

As the laser doesn’t actually physically touch the surface, the stone is not damaged. The blackened dirt layer absorbs radiation very efficiently at the wavelength being used, whereas the object reflects most of the energy away back from its surface. The laser energy vibrates said material at a rapid rate so it expands and is dispersed. The laser does not have the same effect on lighter base material and so it naturally stops short of impacting on the stone beneath.

This means that once the dirt layer has been removed, any further laser pulses hitting the clean surface are not sufficiently intense to cause any damage.

Our trials were proven to be very effective and given enough time and sufficient budget, we are confident the entire inscription could be fully cleaned before being consolidated retaining much of the valuable detail.