Documenting prehistoric parietal art:
recently developed digital recording techniques
21-22 May 2014
Seminar Room
McDonald Institute for Archaeological Research
University of Cambridge, UK

Provisional list of papers

Multi-scale rock-art recording: the 3D Pitoti project in Valcamonica

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Abstract: 3D Pitoti is a three-year EU-funded project to develop a multi-scale 3D imaging process for recording rock-art sites in their landscape context using Valcamonica as its test-case. The final analytic system will seamlessly meld 3D models from the scale of the landscape down to individual peck marks within images and will incorporate automatic image classification and 3D collaborative visualisation platforms. 3D models at the various scales will be derived from structure-from-motion (SfM) processing of images from a manned microlight, micro aerial vehicles (MAVs) and handheld/tripod-mounted cameras. Terrestrial laser scanner (TLS) and structured light scanner (SLS) imaging has also been undertaken. The project is developing a prototype robust, field-ready 3D scanner combining SfM and stereo algorithms for the recording of images on rock-surfaces. This prototype will be field-tested in Valcamonica during summer 2014. This scanner will have a resolution of approximately 0.1 mm and will be capable of recording both filiform and pecked images. During our presentation we will show scans at various spatial scales and will discuss the strengths and weaknesses of the alternative techniques.

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Title: TBC

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Title : TBC

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Intuition and analysis in the recording, interpretation and public translation of Neolithic engraved signs in western France

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Abstract: Philosophers (Bergson 1903 ; Deleuze 1968) tell us that we must distinguish between two profoundly different ways of knowing a thing. The first implies that we go around that thing; the second, that we enter into it. The first depends on the observer's point of view and on the symbols that are used to express that point of view. The second does not adopt any point of view, nor does it rely on any symbol. One could say that the first knowledge stops at the relative, whereas the second, where possible, achieves the absolute.

Let us take a bird in the sky above Carnac, or a boat on the horizon. My perception of the movement of an object in space differs according to whether my point of view, from where I observe that object, is static or moving; and I will express what I see differently according to my own points of reference – that is, according to the symbols that I use to translate that perception. I describe this approach as 'relative' in this double sense: whether I am static or moving, I place myself outside the object that I am perceiving. As for the other approach, that of absolute movement, I attribute to the moving object an interior existence, with a soul that can experience different states, and I sympathise with those states, and I enter into that object through an effort of imagination. It follows that the only way to grasp an absolute is through intuition, while everything else can be apprehended through analysis.

Consequently, the act of interpreting a Neolithic carving on a standing stone or on a boulder demands the generous use of language: on the one hand, the language of science, which is dominated by the symbol of equality, and where each term can be replaced by others; and on the other hand, by the lyrical language, where each term is irreplaceable and can only be repeated.

But the language of science cannot be anchored within an archaeological reality that is distorted by a poorly-controlled process of information acquisition. We must adopt an approach, both in the field and in the laboratory, which allows one to reproduce an experience and which takes account of our choices and our initial interpretations in the graphic representation of the painted or engraved signs, through the implemented sensors.

This contribution will showcase the use of an approach that integrates several digital methods (lasergrammetry, photogrammetry, colour detection and recording under turning oblique light) and allows us to progress the archaeology of images. It both shares and accumulates our information base and our knowledge, proceeding as it does on a basis that is epistemologically renewed.

(tr. A. Sheridan)

Bergson H., 1903. Introduction à la métaphysique. In : La pensée et le mouvant. Essais et conférences. Paris : Presses Universitaires de France (1938 et 1969).

Deleuze G., 1968. Différence et répétition. Presses Universitaires de France (Collection : Epiméthée).

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Advancing in the digital recording of rock art through non-destructive methods: conventional digital tracings vs multispectral imaging

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Abstract: This paper compares conventional digital rock art recording produced with conventional digital cameras versus multispectral imaging acquired with a SLR digital camera. On the one hand, imagery from the conventional digital colour camera are enhanced and manipulated with graphic editing software (such as photoshop, gimp, and so forth) to produced digital tracing. On the other, different multispectral analysis tools are tested to enhance pigments in order to read the unreadable. The outputs can be used not only to improve the level of detail obtained with conventional digital cameras, but to speed up both expert's handling and fine documentation of small details.

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Digital image enhancement with DStretch : improving reliability of rock art studies

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Abstract: Among all the tools currently available for rock art studies, DStretch, plug-in for ©ImageJ designed specifically for the enhancement of digital images of pictographs, is one of the most efficient to decipher faint paintings and sometimes engravings. In addition, ease of use and timeliness of results make it the ideal tool to conveniently improve the reliability of rock art sites documentation, from inventories to tracings. We will present several examples of the benefits of using DStretch, from african prehistoric pictographs to alpine paintings and petroglyphs, and we will also question the limitations of image enhancement tools as well as the necessary requirements for their rigorous use.

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Major steps in the integral recording of Levantine paintings at the time/space axis: first results in the Cova Remigia rock art shelter (Gassulla, Castellón, Spain).

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Abstract: The Spanish Levantine rock art is a unique pictorial expression in the frame of the recent European Prehistory. The naturalism of its depictions and the narrative component of

its scenes make of this pictorial art a formidable instrument in our goal to gain a deeper historical understanding of Neolithic societies of the Iberian Peninsula.

Located in the rock shelters in the inland regions of the Iberian Mediterranean basin, more than 700 sites have been discovered up to the moment in a territory of around 80.000 km2.

Bearing these premises in mind, the recording of the Levantine rock shelters must answer to a double goal a) scientist, since it is necessary to obtain a precise and rigorous recording support that allows us to analyse each of the phases that compose the "chaîne opératoire" concerning the execution of motifs; and b) Heritage conservation, since the methods developed must both respecting the integrity of the archaeological object and offer a versatile and understandable documentation for a not specialized public.

Throughout the latter decade, our research team of the University of Valencia, in collaboration with the Polytechnics University, have developed a new protocol of recording, which goal was trying to give response to the challenges mentioned above. The revolutionary advances that have taken place in the last years in the digital support, the IT treatment of the image and the virtual restitution of the third dimension have been definitive in the design of this protocol.

The incorporation of the digital image to rock art recording, as well as, of some image enhancement software, such as Photoshop and, more recently, D-Stretch, has allowed us to obtain high quality 2D tracings of the motifs, permitting to open new lines of research regarding technical and stylistic aspects of the Levantine figures. On the other hand, the need to offer a spatial reading, in order to ease the analysis of narrative and composition of the scenes, has led us to generate a new document that integrates the individual 2D tracing in the volumetric restitution (3D) of the panel, producing models that avoid the metric distortion and favour an analysis of motifs and support as an indivisible unit.

Now, we make a further step towards the integral recording of Levantine paintings, integrating in the generated 3D models the representation of the fourth dimension: a temporal reading of the diachronic construction of the panels by means of instruments of spatial analysis, which will be definitive in our goal of reconstructing the Levantine sequence in this region.

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Title: TBC

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Digital image analysis based study, recording, and protection of painted rock art. Some Iberian experiences

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Abstract: This work reviews different approaches, with the common point of using digital image analysis techniques imported from the research field of environmental remote sensing, used the last years by our research group for obtaining information from prehistoric painted

rock panels. The obtained results are relevant for the definition of the particular environments of different panels (the complex series of elements composing the natural systems in which the rock art constitute one of the parts, and the relations and synergies connecting all them), for the definition of the rock art itself (in terms of composition, taphonomical history or typology), or simply for improving the vision of faded images, helping in the task of making a secure tracing of the panel. This paper presents several examples in which image uncorrelation by Principal Components Analysis, mixed digital classification, and auto-tracing helps understanding the panels.

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Progressing processes: recording prehistoric carvings in Ireland
Ken Williams, independant
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Abstract: In Ireland carvings are known at both megalithic tombs and on natural outcrops and boulders, but as yet no prehistoric painting has been identified with certainty. Carvings have been systematically catalogued from the mid-twentieth century onwards, with full-scale tracing onto cellophane being the dominant recording technique. The passage tomb of Knowth, Co. Meath, with c. 370 carved stones affords a case study in the development of recording techniques over fifty years.

The second part of the talk provides a short overview of the developments in digital recording of prehistoric carvings in Ireland. Although there has yet to be any systematic and comprehensive digital recording project for rock art in Ireland, this often overlooked aspect of Irish pre-history has more recently enjoyed a small but growing profile among academics, amateur researchers and local communities. Through the use of various innovations in recording, presentation and engagement, an ever growing audience has been introduced to the corpus of Irish rock art and the lesser known examples of megalithic art outside the Boyne Valley.

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