Dust in space and documentation

Considers the scope of the term 'information', and whether its usage in the physical sciences has relevance for the sciences of recorded information.

In early August 2007, a number of newspapers carried dramatic headlines such as "Dust 'comes alive' in space" (Boone 2007). These reported the findings of a study showing that galactic dust could form spontaneously into helical structures, with the possibility of reproducing themselves through information transfer, and could "contain a code comparable to the genetic information held in organic matter", and could be the basis for a kind of "weird life" (Boone 2007).

This came at a particularly timely moment for me, as I read this article while on the way to the CoLIS 6 (Conceptions of Library and Information Science) conference, to present a paper proposing a view of information as a unified concept, spanning the physical, biological and human worlds (Bawden 2007A). The article provided a valuable source of quotations to introduce the presentation.

The article on which the newspapers stories were based (Tsytovich, Morfill, Fortov, Gusein-Zade, Klumov and Vladimirov (2007) gives the more detailed perspective computer simulations suggest that complex plasmas may self-organise into a complex state of interacting helical structures, which exhibit many features thought to be peculiar to life, including the storage and transmission of information between 'generations', and a form of 'memory'. The authors suggest that this may be confirmed by experiments in space, or detected by telescopic observations, and that this possibility should inform our ideas of what 'life' may be, and hence the way in which SETI (the Search for Extra Terrestrial Intelligence) is carried out. (For comments on this, including some scepticism, see Battersby 2007).

Fascinating though this may be, does it have any relation to 'information' as it is understood in the library / information sciences ? Even less likely, perhaps, does it have any potential relevance for our discipline and professions ?

The answer to that question will depend on whether one sees 'our' kind of information as being a thing in itself, quite distinct, except in very general and trivial ways, from that which is called information in the physical and biological sciences. This view is the more usual, and is espoused, for example, by Floridi (2005), for whom information is 'meaningful data and by Hjorland (2007), for whom it is 'any difference that makes a difference'. To this subjective and human-centred view of information, the 'information' in space dust cannot have any direct relevance.

An alternative viewpoint exists: authors such as Stonier (1997) and Bates (2006) have argued that real and meaningful inks – most strongly, evolutionary links - may be seen between the concept of information in the physical, biological and human domains. I have followed this approach (Bawden 2007B), suggesting that information may be regarded as form of self-organised complexity in the physical world, from which the emergent properties of meaning in context and understanding appear in the biological and human realms respectively. For those who incline to this view, the space dust will have quite a different significance: it is a form of information on a spectrum towards the kind with which we are primarily concerned, and its study may have lessons for our own disciplines.

And perhaps the reverse … I have tentatively suggested (Bawden 2007B) that the most intriguing aspect of a unified view of the concept of information is the idea that the findings of research and scholarship in the information sciences may have applicability and value in the physical and biological sciences, as they become more 'information centric'.

Perhaps the space dust has something to learn from us.

Bates, M.J. (2006), Fundamental forms of information, *Journal of the American Society for Information Science and Technology*, 57(8), 1033-1045

Battersby, S. (2007), Could alien life exist in the form of DNA-shaped dust ?, *New Scientist*, 10 October 2007, available from http://space.newscientist.com

Bawden, D. (2007A), Information as organised complexity: a unifying view point, *Information Research*, 12(4), paper colis31, available from http://informationr.net/ir/12v4/colis/colis31.html

Bawden, D. (2007B), Organised complexity, meaning and understanding:
an approach to a unified view of information for information science, *Aslib Proceedings*, 59(4/5), 307-327

Boone, R. (2007), Dust 'comes alive' in space, *Sunday Times (London),* August 12 2007, page 10

Floridi, L. (2005), Is semantic information meaningful data ?, *Philosophy and Phenomenological Research*, 70(2), 351-370

Hjorland, B. (2007), Information: objective or subjective ?, *Journal of the American Society for Information Science and Technology*, 58(1), 1448-1456

Stonier, T. (1997), *Information and meaning: an evolutionary perspective*, London: Springer-Verlag

Tsytovich, V.N., Morfill, G.E., Fortov, V.E., Gusein-Zade, N.G., Klumov B.A.,and Vladimirov, S.V. (2007), From plasma crystals and helical structures towards inorganic living matter, *New Journal of Physics*, 9, 263, available from http://www.iop.org/EJ/journal/NJP