

RÉSUMÉ

Beaming down

The dwarf star AU Microscopii (the name refers to its constellation, not its size) produces occasional flares of emission whose mechanism, which may also be relevant to solar flares, is little understood. Spectroscopic observations using the Hubble Telescope (B. E. Woodgate *et al.* *Astrophys. J.* **397**, L95–L98; 1992) of one revealed an increase in brightness on the redward side of the hydrogen Lyman- α emission line. This fits a proposed mechanism in which an energetic proton beam travels along a loop of magnetic field extending from the star. On the downward journey it interacts with neutral hydrogen, swapping electrons and generating Lyman- α emission with a small Doppler shift. Whether this was a freak or a characteristic event cannot yet be said.

Future attractions

DESIGNER magnets are the promise of H. Tamaki *et al.* (*J. Am. chem. Soc.* **114**, 6974–6979). The aim in trying to develop so-called molecular magnets is to combine magnetism with the material properties possible with modern synthetic chemistry. In general this work has concentrated on linear organic compounds, which are inherently one-dimensional. Tamaki *et al.* base their approach on a 'one-pot' synthesis using metal oxalate complexes to make three-dimensional examples. Two of the oxygens on each of the three oxalate ($O_2C_2O_2$) ions in a complex are bound to the central metal atom. The other three pairs bristle outwards so that, on addition of tetrabutylammonium to the dissolved metal oxalate, the complexes link up as a three-dimensional network to produce green microcrystals. Magnetic susceptibility measurements show that the microcrystals are ferromagnetic at low temperature.

Solar sterilization

CORRESPONDENTS to *The Lancet* continue to explore a low-technology way to help stem the rising tide of cholera in South America. *Vibrio cholerae* is largely transmitted through drinking water but can be inactivated by sunlight. Reporting on experiments in Ecuador, T. D. MacKenzie *et al.* (**340**, 367; 1992) suggest that the effectiveness of solar sterilization depends in part on altitude. T. Joyce *et al.* now weigh in with the results of experiments carried out in Dublin (**340**, 921; 1992). Their prescription is that the bottle used should be made of plastic not glass; and that water should be left to stand before being exposed to the Sun, to allow sediment to settle. Cloudiness in the water diminishes the effectiveness of the treatment and may, they say, have been responsible for the reduced disinfection seen at low altitude by MacKenzie and colleagues.

NEUROPSYCHOLOGY

Drawing upon the mind's eye

Jennifer M. Gurd and John C. Marshall

CAN an otherwise healthy adult plainly 'see' a familiar object (an umbrella, for example) but not recognize what it is? Surprisingly, yes. The condition, now known as associative visual agnosia, was first described by the Breslau neurologist Heinrich Lissauer in 1890¹ and a particularly clear-cut case is reported by Behrmann, Winocur and Moscovitch on page 636 of this issue².

These patients show a severe deficit of visual recognition despite perceptual abilities that seem to be sufficiently well-preserved to support identification by sight. They may thus be able to copy line drawings (or draw from a three-dimensional model) accurately enough to allow an observer to identify the drawing but are themselves unable to do so. By contrast, there is little or no difficulty in recognizing (and naming) the same objects by touch (or after tracing over visual forms with the finger)³. The lesion responsible is usually in the occipitotemporal regions of the left cerebral hemisphere.

In many such cases, drawing from memory is also seriously impaired⁴, even in patients who were skilled graphic artists prior to their brain lesion⁵. So it could be that the patients have lost from their pictorial memory the visual schemata of even quite common objects. This loss will rarely (if ever) be total. The recognition errors that patients make usually show some visual resemblance to the target object (C. K., the case of Behrmann *et al.*, named a pair of pliers as a clothes peg), but the distinguishing features for correct identification are unavailable. C. K. shows more convincingly than any previous case that the above account cannot apply to all instances of associative visual agnosia.

C. K. is grossly impaired in identifying written material, line drawings and real objects by sight, yet his copies (although constructed in a slavish, piecemeal fashion) are extremely accurate. By contrast, his drawing from memory is excellent: the examples shown in Fig. 1c (page 637) are detailed, well-proportioned and executed with an elegant, flowing line. As with his spontaneous handwriting in Fig. 1b, C. K. cannot identify his own drawings when they are shown to him some time later. His mental image of the objects he can 'see' (but not recognize) must accordingly be intact. This conclusion is borne out by C. K.'s flawless performance on tests of visual imagery; he can, for example, judge whether an imagined lower case letter contains an ascender or a descender and whether particular animals have

tails that are long or short in relation to their body size. As Behrmann *et al.* write, "No other case of such a clear dissociation between impaired object perception and intact imagery has been reported to date", although another recent paper, by Jankowiak and colleagues⁶, describes a patient who appears to be quite similar to C. K.

These cases contrast with patients who are unable to generate visual images 'in the mind's eye' but have reasonably intact recognition of what they see⁷. The double dissociation (intact imagery with impaired recognition versus impaired imagery with intact recognition) suggests that functionally (and perhaps anatomically) distinct routes to a central store of visual schemata can be selectively damaged.

What, then, might account for identification failure despite apparent 'seeing'? According to one hypothesis, higher levels of perception are not fully intact in the associative visual agnosias. Observe C. K.'s copy of an array of a circle and two diamonds (Fig. 1a on page 637). It is obvious from the stroke pattern of C. K.'s copy that he has not seen these forms as a circle and two diamonds. There is a failure of pictorial parsing despite the fact that the final outcome is an accurate copy. If access to pictorial memory is based on a correctly parsed visual input, C. K.'s recognition failure would follow from his failure to 'see' the relationships between the component elements of the stimulus pattern⁸.

An alternative (or complementary) hypothesis, proposed by Jankowiak *et al.*⁶, suggests that deficient lateral inhibition between the neural representations of visually similar objects could be responsible for the impairment. If perceptual input triggered a small set of rival interpretations, a failure of the lateral inhibitory feedback that normally amplifies small differences between visual configurations could result in misidentifications that preserved the overall shape of

1. Lissauer, H. *Arch. Psychiat.* **21**, 222–270 (1890).
2. Behrmann, M., Winocur, G. & Moscovitch, M. *Nature* **359**, 636–637 (1992).
3. Landis, T., Graves, R., Benson, F. & Hebben, N. *Psychol. Medicine* **12**, 515–531 (1982).
4. Mehta, Z., Newcombe, F. & De Haan, E. *Neuropsychologia* **30**, 645–655 (1992).
5. Wapner, W., Judd, T. & Gardner, H. *Cortex* **14**, 343–364 (1978).
6. Jankowiak, J., Kinsbourne, M., Shalev, R. S. & Bachman, D. L. *Cog. Neurosci.* **4**, 119–131 (1992).
7. Basso, A., Bisiach, E. & Luzzatti, C. *Neuropsychologia* **18**, 435–442 (1980).
8. Kanizsa, G. *Organization in Vision: Essays on Gestalt Perception* (Praeger, New York, 1979).
9. McCarthy, R. A. & Warrington, E. K. *Cognitive Neuropsychology: A Clinical Introduction* (Academic, New York, 1990).
10. Young, A. W. *Phil. Trans. R. Soc.* **B335**, 47–54 (1992).