The β -carbolines may offer a treatment for senile dementia primarily by disinhibiting the remaining cholinergic neurons of the basal forebrain. *a*, In the normal brain, cholinergic neurons (CN) may innervate predominantly cortical pyramidal cells. *b*, Possible therapeutic action of the antagonist β -carboline ZK 93426 in facilitating the action of cholinergic neurons in the early stages of Alzheimer's disease. All benzodiazepine receptors are blocked (—), and acetylcholine release and high-affinity choline uptake are enhanced. Such a disinhibitory effect at the cell body of cholinergic neurons enhances impulse conduction, and also possibly the transport of proteins and phospholipids. *c*, By the time of death, the majority (30–70 per cent) of the extrinsic cholinergic neurons have degenerated without a major consequence for the postsynaptic muscarinic receptors (MR). It is not known whether cholinergic therapy would retard this degenerative process. (Adapted from Sarter, M. *et al. Trends Neurosci.* 11, 13; 1988.)

influence on the cholinergic cells (see figure). This hypothesis is supported by the fact that ZK 93426 reverses some of the deleterious behavioural effects in rats of the anticholinergic drug scopolamine and the effects of neurotoxic lesions of the substantia innominata (now, however, widely suspected to produce many of their behavioural effects by disrupting non-cholinergic mechanisms).

ZK 93426 has not been clinically assessed, but its effect on attention and memory has been tested in normal young human volunteers, with acute intravenous administration. T. Duka (Schering AG, Berlin) reported some significant effects on measures of vigilance and attention, as well as small beneficial effects on visual recognition memory. No significant effects were found on tests of rapid information processing similar to those used to test nicotine above. It seems that the β -carboline strategy might be worth pursuing, but a more potent compound would be required to hold much promise for patients with DAT.

A radically different approach, with a strong flavour of serendipity, emerged from the report by G. Clincke (Janssen Research Laboratories, Beerse) of fairly impressive effects on sophisticated tests of

learning and memory, in normal young and elderly volunteers, of a compound whose pharmacological actions are quite obscure. The drug concerned, R58735, has a profile related to the anti-epileptic agent carbamazepine, and has some affinity for histamine (H₂) receptors, but the relevance of these actions to its effects on cognition is dubious.

Although effective cognitive enhancers may yet emerge from rational programmes of drug development based on what we know about the neurochemical changes in dementia and a careful characterization of drug action at a cellular level, this putative class of compounds may be no less prone to unexpected additions than the progenitors of the antipsychotic and antidepressant classes that were discovered almost accidentally in the 1950s. In the meantime, as potential but discerning consumers, we should perhaps be prepared for the anticipated inundation of candidate cognitive enhancers by developing standardized and comprehensive tests of cognition that can be used for comparing their effects across species as well as in objective clinical assessment. □

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Daedalus

Private lights

LAST week Daedalus devised a highly efficient lighting system for TV studios. Each camera projects light from its lens on the studio scene, which scatters it to the cube-corner-patterned studio walls. These reflect each photon straight back to the point on the scene from which it was originally scattered. It then undergoes a second scattering, the precise optical reverse of the first, and is therefore fired back into the camera lens. Almost all the light from the camera lamps returns to make the image, and mere watts of light can create a brilliant and colour-saturated scene. Daedalus is now extending the idea to human vision.

His lamp-bearing beam-splitter spectacles launch light out from the wearer's eyes. A few sheets of corner-cube-embossed reflector film placed around the scene then appear to illuminate it brilliantly in vivid colours. As a way of saving domestic electricity this is perhaps a bit cumbersome, but for lighting public spaces it is perfect. The old wasteful socialist ideal of public lighting would be replaced by the modern efficient entrepreneurial concept of private lighting. For the intriguing feature of Daedalus's system is that each user sees only by his own light. Photons from other observers bounce back to them alone, and hardly interfere. People who like their illumination blindingly bright, or garishly coloured, or polarized, or strobed, can all have it, without annoying anyone else. Those too poor to afford the equipment are, very properly, left in the dark. Only the reflectors are public property, and they waste no energy.

The new system should be particularly useful for lighting the roads. Daedalus is devising a cube-corner-printing steam-roller which embosses the desired reflecting pattern on the carriageway, and aluminizes it for high reflectivity. Wearers of his beam-splitter spectacles will then see the nocturnal road as a shining ribbon of light on which other vehicles are sharply outlined, illuminated from below. Intriguingly, this system may be usefully speed-sensitive. A photon bouncing off a moving vehicle will find it displaced by a few nanometres when it returns from the reflective road. Its second reflection will not be quite the reverse of its first one, and it may not quite retrace its path to the eye. The resulting strange and non-intuitive pattern of light and shade will immediately call attention to the moving vehicle. At first Daedalus feared that a very fast vehicle might be rendered completely invisible by this effect. But he now realizes that it will still obscure light from the road behind it, and will appear as an ominous speeding shadow.

David Jones