From the library

Remembrance of things past

"A photograph of Ahmad (unlike his father, he did not object to being portrayed) shows him watching the executions, surrounded by family and courtiers. The Imam sits in the middle, his great bulk clothed in white, his face framed by a dense beard (dyed black it was said to have gone gray prematurely during a fight with a jinni who was guarding a treasure), a white turban on his shaved head. The eyes, the famous exophthalmic stare said by his detractors to have been deliberately induced by sleeping with a rope tied around his neck, study the scene with shrewd but yet bemused appreciation". (Tim Mackintosh-Smith. *Yemen, the unknown Arabia.* New York: The Overlook Press, 2000:107.)

Birds may have magnetic eyes

Every year millions of birds migrate north and south looking for a more plentiful food supply. The puzzle of how birds know where to fly has bemused and interested humans for centuries. Now, this past February, a group of investigators at the University of Illinois at Urbana-Champaign, has proposed that birds may have a unique way of seeing. These investigators' new theory suggests that birds can "see the earth's magnetic field in dim blue or green light". According to this theory, incoming blue or green light activates a light sensitive pigment in the bird's eye, which in turn gives rise to electrically charged molecular fragments. The charged fragments can occur in one or two quantum mechanical states, and the rate at which one of the states is produced depends on local conditions of the earth's magnetic field. The varying chemistry in the bird's eye thus serves as a reliable indicator of the local strength and direction of the earth's magnetic field. These investigators caution, however, that the exact molecules and mechanisms that are affected by the local magnetic field have yet to be discovered. (*The Sciences* May/June 2000:9–11.)

Intermittent HAART therapy

The success of highly active antiretroviral therapy (HAART) in suppressing HIV viral loads has given hope to people infected with the HIV virus. These potent multidrug regimens can prolong life for patients, and yet there are drawbacks to this therapy. It is costly, adverse side effects occur, and the complicated medical schedule often leads to non-compliance. Moreover, there is current evidence that HAART therapy cannot completely eliminate HIV from the body.

Anthony Fauci, MD, director of the National Institute of Allergy and Infectious Diseases, has announced the initiation of a trial to enrol HIV infected patients on HAART therapy in a randomised controlled study to compare continuous therapy with intermittent therapy. Although Fauci expressed caution about intermittent HAART therapy, he hoped that it might be effective as continuous therapy and thus reduce the problems of toxicity, cost, and non-compliance. If intermittent HAART therapy is effective, it will be good news to places in the world where continuous HAART therapy is simply too expensive (for example, in Africa). (*JAMA* 2000;**283**:2917–18.)

Detecting prions in human disease

It now appears clear that prions, an infectious protein, initially described by Pruisner, are responsible for the neurodegenerative Creutzfeldt-Jakob disease in humans and bovine spongiform encephalitis in cattle. Heretofore, the detection of the prions in these disorders has only been possible at the time of postmortem examination of the affected brain tissue.

Now researchers at the Max Plank Institute, for biophysical chemistry, and the University of Gottingen, have developed a technique using spectroscopy to detect prions in cerebrospinal fluid. Using a specific antibody probe tagged with fluorescent dyes, the researches were able to label the preon particles that appear as intensely bright targets when scanned with a laser beam. This technique may prove fruitful in the investigation of other neurodegenerative diseases that may or may not be caused by prions. (*Proceedings of the National Academy of Science* 2000:May 9.)

Michelangelo's David has strabismus

Mark Levoy, a computer scientist, from Stanford University, spent a sabbatical making computer images of Italian sculptures. In one study, he carefully analysed the frontal view of the face of Michelangelo's "David". This view is usually hidden by the upraised left hand. Levoy used a thin sheet of laser light and, by beaming it on the statue, recorded the shape of the beam edge as it swept across its surface. Repeated scans can create an overlay that generates a detailed image that can reveal chisel marks less than a millimetre across. By hoisting the laser onto a gantry and pointing it at David's face, Levoy demonstrated that the eyes are slightly divergent in this classic sculpture. It has been suggested that this divergence was purposely portrayed in order to optimise each eye's appearance from either side of the sculpture. (*New Scientist* 10 June 2000;**165** (No 2242):9.)

Penetrating the blood-brain barrier

Both the brain and the eye are protected from potentially dangerous substances circulating in the blood by tight junctions of the capillary cells supplying these tissues. Only recognised molecules can pass this barrier. Investigators at the University of California's School of Medicine in Los Angeles, have described a technique that tricks the barrier into letting therapeutic genes pass through this barrier while still protecting against harmful substances. These researchers packaged genes inside lyposomes (fatty spheres) and then tethered this package to an antibody that binds to the receptors of the brain's capillary cells; these the capillary cells in turn are allowed to pass through the barrier. This piggy backing technique does not interfere with the endogenous transport system. These researchers were successful in injecting a package containing a gene for luciferase into a rat's bloodstream that was then detected within the brain tissue itself. This approach offers the possibility that in the future similar methods will be employed in the efforts to use gene therapy for brain and ocular disease. (*New Scientist* 10 June 2000;**165**(No 2242):10.)

Why smoking may cause cataracts

Epidemiological data strongly support an association between cataract and cigarette smoking. Studies have clearly established a link between cigarette smoking and both cataract formation and progression. In particular, nuclear and posterior subcapsular types have been implicated. The precise mechanism responsible for cataract formation in relation to cigarette smoking remains unknown.

Investigators at Columbia Presbyterian Medical Center in New York have recently completed studies suggesting that it may be nitric oxide and its derivatives that are responsible for the lens changes associated with smoking. In this study, the investigators report on the reaction of nitrite with α crystallin, the major lens matrix protein. Incubation studies reveal that protein modifications in α crystallin, including increased fluorescence, yellowing, and protein cross linking, resulted from exposure to nitrite. Therefore, a non-enzymatic nitration of α crystallin provides a possible explanation why lens protein may be damaged as the result of cigarette smoking. (*Experimental Eye Research* 2000;**70**:73–80.)

Recommended reading

William Osler: A Life In Medicine. By Michael Bliss. Oxford: Oxford University Press, 2000.

William Osler, MD, born in England, raised in Canada, became a famous physician in his country of birth, his country of childhood, and the United States. He was made the first chief physician of Johns Hopkins Hospital, later becoming the dean of that premiere institute. Later in life, he became the Regius Professor of Medicine at Oxford. His textbook, *The Principles and Practice of Medicine* published in 1892, was a classic quoted long after his death. Osler was known for his interest in philosophical issues as well as public health. He became a noted essayist and sought after speaker. At the time of his death, an editorial in the medical press began "William Osler was the greatest personality in the medical world at the time of his death". However, it was the biography of William Osler by Dr Harvey Cushing that firmly established the legend of William Osler so that he remained a hero for decades of medical students. In a long and well detailed book, Michael Bliss has now called into question some of our preconceived ideas of William Osler. Indeed, he confesses that it seems almost inexplicable that a doctor who made not a single major discovery in medicine has been idolised and praised for so many decades. This is a revisionist biography, well written and referenced, that forces us to reassess the contributions of William Osler.

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