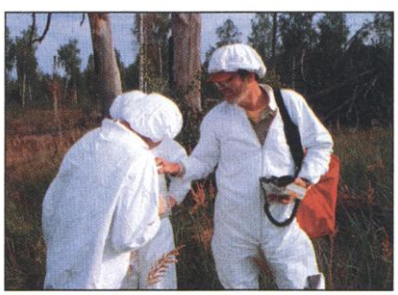
The Future of UNSCEAR

THE EXISTENCE OF THE UNITED NATIONS Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) is in danger. Dramatic decreases in funding have virtually paralyzed its activities: This year the Committee was unable to convene to continue its scientific work.

Established in 1955, UNSCEAR compiles scientific data on the sources of ionizing radiation and assesses their impact on humans and the environment. The Committee reports directly to the UN General Assembly. The Committee is composed of 21 member states, and about 100 people work for it: three members of the Secretariat, about 80 members of national delegations, and a rotating quorum of about one dozen consultants, internationally recognized experts in the field who are recruited by the Secretariat. Under the guidance of the Secretary, the consultants draft scientific documents requested by the Committee for review and discussion.



Cleanup efforts at Chernobyl. UNSCEAR produced a report on the health effects of ionizing radiation from the Chernobyl accident.

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The Committee has estimated exposures from nuclear test explosions; civilian and military nuclear fuel cycles; medical uses of radiation; occupations involving radiation; nuclear accidents; and natural radiation. The Committee has also studied the basic biological processes needed for understanding the mechanisms of somatic and genetic effects of radiation and developed a highly effective and competent method of measured authoritative reviewing of the original scientific information.

In its 1994 report, UNSCEAR confirmed for the first time the existence of adaptive and beneficial effects of low levels of radiation. In the 2000 report on the health effects of the Chernobyl accident, the Committee estimated that except for the 30 deaths of power plant employees and firemen and an increase (almost entirely treatable) of childhood thyroid cancer, no increase in overall cancer incidence or mortality and no increase of hereditary disorders have been observed that could be attributed to ionizing radiation.

Because of the high standard and objectivity of its work, UNSCEAR has become the most authoritative international scientific body in matters of radiation risk. UNSCEAR's assessments are one of the factors driving the nuclear atmospheric test ban treaty and constitute an objective and independent basis for setting regulations for radiation protection.

The UN General Assembly has endorsed the work of UNSCEAR in its annual resolutions, including the most recent one in which it "commends [UNSCEAR] for the valuable contribution it has been making in the course of the past forty-six years, since its inception, to wider knowledge and understanding of the levels, effects and risks of ionizing radiation, and for fulfilling its original mandate with scientific authority and independence of judgement" (*1*).

Until about 1992, the funds provided to UNSCEAR by the UN were lean, but adequate for its functioning. Since then, per annum allocations have been systematically decreased, with 2002 funding at about 50% of the 1992 level. The actual decrease is even more marked, as these figures are not adjusted for inflation. It is difficult to understand why the UN could accept a situation where a lack of about $100,000 to $300,000 a year is allowed to pose a threat to UNSCEAR's very existence. It appears to me that the fiscal difficulties began when UNSCEAR financing was arranged via the UN Environmental Programme (UNEP) in Nairobi. A divorce of UNSCEAR from UNEP might be a possible remedy. Dissolution of UNSCEAR would be an immeasurable loss to world science and to future development of the radiation protection system.

To save UNSCEAR, a return to the funding level of 10 years ago is necessary. To this end, political will is needed in the UN General Assembly and in its Fourth Committee. Those who are concerned about the future of UNSCEAR can urge their governments to support the further existence of the Committee within the UN.

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Reference
1. A/RES/56/50 of 10 December 2001; released 14 February 2002.

Everything Old Is New Again?

IN THEIR REPORT "MIDBRAIN CONTROL OF three-dimensional head orientation," E. M. Klier *et al.* (15 Feb., p. 1314) describe electrical stimulation and muscimol injection into the interstitial nucleus of Cajal (INC) in freely moving monkeys. They conclude that the INC is a key integrator for head posture and suggest that this may be the site of disturbance in the human movement disorder torticollis.

As in many fields of science and medicine, "everything old is new again." In 1954, Hassler and Hess published original data in German (*1*), and these results were summarized in English in 1960 (*2*). This summary stated that "the mechanism responsible for rotation around the longitudinal axis lies in the nucleus interstitialis of Cajal..." (*2*, p. 891) and that "weak monopolar stimuli ... was able to produce rotatory movements of the head around the longitudinal axis toward the side of stimulation..." (*2*, p. 890). Furthermore, this nucleus and the surrounding regions have been explored in humans using electrical stimulation during stereotactic surgery for torticollis. K. Sano *et al.* (*3*) reported that vertical head movements were produced by stimulation in this region and that radio frequency lesions relieved retrocollis in three of five patients. Hassler preferred one of the efferent projection targets of the INC, the ventro-oralis internus thalami, as a target for stereotactic surgery for torticollis (*4*) and the prestitial nucleus for retrocollis (*5*).

Although there may be difficulties in interpreting the reports of human stereotactic surgery from the 1950s through the 1970s, because of the absence of postoperative imaging to identify the exact lesion and stimulation sites, the data should not be disregarded. Credit must be given to the scientists and surgeons who first reported and studied the physiological pathways involved in head movement and torticollis.

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2. R. Jung, R. Hassler, in *Handbook of Physiology*, J. Field, H. W. Magoun, V. E. Hall, Eds. (American Physiological Society, Washington, DC, 1960), vol. II, sect. I, chap. 35, pp. 863–927.
3. K. Sano *et al.*, *Confin. Neurol.* **32**, 118 (1970).
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5. R. Hassler *et al.*, *Appl. Neurophysiol.* **44**, 291 (1981).

Response

KISS ACCURATELY SUMMARIZES THE SEMINAL work of Hassler, Hess, and colleagues. We reported results that could be described as a quantitative confirmation of some of those classic observations, i.e., that unilateral electrical stimulation of the midbrain interstitial nucleus of Cajal (INC) produces torsional (roll) rotations of the head. We thank Kiss for pointing this out, and we intend to provide a more detailed historical review in a more specialized journal. [Enormous credit is also due to the work of K. Fukushima and colleagues, who have published extensively on the role of the INC in eye and head movements in the cat and their relation to oculomotor deficits in the human (*1*).]

But to focus only on the results mentioned by Kiss would be to miss the main point of our work and the advance that it represents. This advance is that the INC appears to be a neural integrator—not only for eye orientation, as we showed previously, but also for head orientation. The idea of neurally integrating velocitylike movement commands (in the mathematical sense) to produce postural commands, as first proposed by D. A. Robinson (*2*), is well established in the oculomotor literature but previously had not been demonstrated for head control. This is shown quantitatively in our report by the temporal pattern of head motion induced by INC stimulation and, more importantly, by the pattern of head motion induced by inactivating the INC—results that Kiss does not mention.

The concept of a neural integrator—working through a system of balance across the two sides of the brainstem—provides a simple but powerful framework for thinking about head control and torticollis. As Kiss points out, the midbrain has long been implicated in some forms of torticollis, but this disorder has recently received more scientific and clinical attention in the context of basal ganglia dysfunction. Given our findings, it indeed seems important to reexamine the work of Hassler, Hess, Sano, and others in thinking about the etiology and treatment of torticollis.

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Are U.S. Patents Too Broad?

IN HIS ARTICLE "DUPONT UPS ANTE ON USE of Harvard's OncoMouse" (News of the Week, 17 May, p. 1212), Eliot Marshal focuses on the demands made by DuPont on the basis of its exclusive license for Harvard's famous OncoMouse patent. The legitimacy of the company's policy choices in licensing the patent out is discussed, but this discussion is incomplete without questioning whether the patent system functioned properly in issuing this patent.

The Harvard OncoMouse strain was developed by inserting a known oncogene into a preexisting strain of mouse using an already known technique. That any gene could be inserted (in theory) into any life form was already obvious; if the OncoMouse's developers invented something, it was a matter of details. Yet the 1988 U.S. patent covers inserting any oncogene into any mammalian species—arbitrary boundaries that extend far beyond what was invented by producing this strain. Putting aside the larger question of whether aspects of living organisms should be patented, and the practical question of whether strains of organisms should be patented, this patent as issued is absurd.

The U.S. patent system is not a natural phenomenon, nor is it sacred; it is an artificial system of incentives created by legislation. Under the U.S. Constitution, its purpose and justification are to "promote the progress of ... the useful arts" (*1*). If the Patent Office and courts behave in ways that do not serve this goal, the system can and should be changed. The patent system need not allow such broad patents; it also need not allow patent holders such power that they can impose conditions incompatible with the customs of scientific cooperation. Such interference does not "promote progress."

In the meantime, researchers and industrialists who find this patent chafing might consider publicizing the absurdity of the patent, because the Patent Office may then reconsider it. The Patent Office has responded in the past to public outrage. If this patent is made narrower, it could open the door to independent development of other strains and thus to competition; the competing companies may then not feel bold enough to interfere with research. This is no substitute for reforming the system, but it may still be worth the effort.

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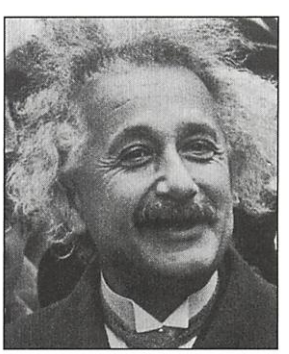
References and Notes

1. The text says "promote the progress of science and the useful arts," but that covers copyright as well as patents; it is often held that "science" applies only to copyright, whereas "the useful arts" applies only to patents.

Einstein and the Orbit of Mercury

IN "THE INTELLIGENT NONCOSMOLOGIST'S Guide to Spacetime" (Spacetime Special Issue, News, 24 May, p. 1418), Charles Seife states, "Shortly after Einstein unveiled it, scientists realized that this gravity-as-curvature-of-spacetime theory explained a mysterious anomaly in the orbit of Mercury." This was not first realized by unnamed scientists, but by Einstein himself. As Abraham Pais writes, "his theory 'explains ... quantitatively ... the secular rotation of the orbit of Mercury, discovered by Le Verrier, ... without the need of any special hypothesis.' This discovery was, I believe, by far the strongest emotional experience in Einstein's scientific life, perhaps in all his life. Nature had spoken to him. He had to be right." (*1*, p. 253).



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References and Notes

1. A. Pais, *'Subtle is the Lord...': The Science and Life of Albert Einstein* (Oxford Univ. Press, Oxford, 1982).