coastal forest on the south. Once cleared of the disease, this zone—with its high rainfall (800 to 2000 millimeters per year) and extensive river system—is expected by development planners and national governments to provide great potential for agriculture and for new settlement. This raises the question of what will happen to the Guinea savanna when population and production increase. Reviews of the World Health Organization's Onchocerciasis Control Program have already expressed concern about problems of environmental degradation in areas opened to new settlement (*1*).

The expectation that greater rainfall in the Guinea savanna than in the Sudan will provide a more secure basis for agriculture is unwarranted because of the extreme seasonality of the region. Increased production and new settlement are also likely to destroy the remaining wildlife habitat in the area and result in land rights conflicts between settlers and the established populations (*2*).

It is imperative, therefore, that the planned health measures be combined with region-wide planning, study, and experimentation in order to avoid the catastrophic consequences of overpopulation and overexploitation of a fragile ecological zone.

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REFERENCES

1. J. Kelly *et al.*, *Impact Review of the Onchocerciasis Control Program—Ouagadougou, August 1985* (AID Project Impact Evaluation Report No. 63, Agency for International Development, Washington, DC, May 1986).
2. A. E. Nyerges, in *Lands at Risk in the Third World—Local-level Perspectives*, P. D. Little and M. M Horowitz, with A. E. Nyerges, Eds. (Institute for Development Anthropology, Monographs in Development Anthropology, Westview, Boulder, CO, 1987), chap. 15.

The Cognitive Unconscious

I would like to comment on the very important article "The cognitive unconscious" by J. F. Kihlstrom (18 Sept., p. 1445). I could find no explicit mention of the role of the unconscious in discovery or the phenomenon of *The Eureka Feeling* (*1*). Nor could I find references to a book by Jacques Hadamard (*2*), who explicitly discussed "The unconscious and discovery"; to W. I. B. Beveridge's excellent book *The Art of Scientific Investigations* (*3*); or to R. B. Livingston's discussion of "How man looks at his own brain: An adventure shared by psychology and neurophysiology" (*4*). I have been greatly influenced by these three authors, and I am convinced that advances on large topics like bioethics and the cancer problem are strongly affected by "the cognitive unconscious."

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REFERENCES

1. V. R. Potter, *Bioethics, Bridge to the Future* (Prentice-Hall, Englewood Cliffs, NJ, 1973), pp. 106–117; *Cancer Res.* **35**, 2297 (1975).
2. J. Hadamard, *The Psychology of Invention in the Mathematical Field* (Princeton Univ. Press, Princeton, NJ, 1945), chap. 3.
3. W. I. B. Beveridge, *The Art of Scientific Investigations* (Norton, New York, 1951).
4. R. B. Livingston, in *Psychology: A Study of Science*, S. Koch, Ed. (McGraw-Hill, New York, 1959), vol. 1, pp. 52–59.

Kihlstrom's informative article contains one statement that may be misleading. The author writes that newer work reveals "a tripartite classification of nonconscious mental life that is quite different from the seething unconscious of Freud . . . ."

While an argument can be made that this description applies to the earliest "topographic" psychoanalytic model, the cognitive unconscious became an explicit part of psychoanalytic thinking and model building (with the "structural" model) in 1920 (*1*). Freud emphasized that the ego appears as largely unconscious. This assertion was borne out by clinical experience, and in particular by unconscious resistances during treatment (*2*). Also, some experiments with tachistoscopic techniques demonstrate convincingly "nonconscious" psychoanalytically conceptualized defensive operations (*3*).

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REFERENCES

1. J. Laplanche and J.-B. Pontalis, *The Language of Psychoanalysis* (1967), D. Nicholson-Smith, Transl. (Norton, New York, 1973), p. 476.
2. S. Freud, *Standard Edition of the Complete Psychological Works of Sigmund Freud*, vol. 19, *The Ego and the Id and Other Works*, J. Strachey, general editor, in collaboration with A. Freud, assisted by A. Strachey and A. Tyson (Hogarth, London, 1961).
3. G. J. W. Smith and A. Danielsson, *Psychol. Issue* (monograph 52) (1982); B. Westerlundh and G. Smith, *Psychoanal. Contemp. Thought* **6**, 597 (1983).

Response: Regrettably, considerations of space required that I omit from my article descriptions of several highly interesting lines of experimental research on nonconscious mental processes, including work on cognition during sleep (*1*) and during general anesthesia (*2*).

Potter is right, I think, that the "eureka feeling" reflects the operation of nonconscious mental processes, which work on the problem at hand outside of awareness, and then (as it were) present the solution to the thinker. Many writers, composers, and artists also report this kind of experience. In the literature on problem-solving, the eureka feeling is technically known as incubation—a phenomenon in which people achieve a solution to a difficult problem only after putting it aside (and presumably out of mind). Unfortunately, this phenomenon has proved extremely difficult to tame and to bring into the experimental laboratory for study (*3*). Bowers (*4*) has recently had some success in this regard, but we still have a long way to go before we understand this particularly interesting aspect of creative thought.

Kafka is right that references to the cognitive unconscious occur in some later writings of Freud and that this theme was later taken up by Heinz Hartmann, George Klein (who also did some experimental work on the subject), and others in the psychoanalytic movement known as "ego psychology." At the same time, it is sometimes forgotten that there was considerable philosophical and psychological work on unconscious mental life *before* Freud (*5*). Freud's unique contribution was a description of nonconscious mental life in terms of sexual and aggressive drives and defenses against them. Scientific validation of these particular claims of classic psychoanalysis has proved extremely difficult to come by, in part because of the theory's reliance on clinical evidence. Some investigators have produced some very interesting experimental findings (*6*), however, and I hope we may look forward to more in the future.

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REFERENCES

1. A. M. Arkin, J. S. Antrobus, S. J. Ellman, Eds., *The Mind in Sleep: Psychology and Psychophysiology* (Erlbaum, Hillsdale, NJ, 1978).
2. H. L. Bennett, in *Consciousness, Awareness, and Pain in General Anesthesia*, M. Rosen and J. N. Lunn, Eds. (Butterworths, London, 1987), pp. 132–139; L. Goldmann, in *ibid.*, pp. 140–148.
3. J. R. Anderson, *Cognitive Psychology and Its Implications* (Freeman, New York, 1985), pp. 228–230.
4. K. S. Bowers, in *The Unconscious Reconsidered*, K. S. Bowers and D. Meichenbaum, Eds. (Wiley-Interscience, New York, 1984), pp. 227–272.
5. H. F. Ellenberger, *The Discovery of the Unconscious: The History and Evolution of Dynamic Psychiatry* (Basic, New York, 1970); L. L. Whyte, *The Unconscious Before Freud* (Basic Books, New York, 1960).
6. H. Shevrin and S. Dickman, *Am. Psych.* **35**, 421 (1980); L. H. Silverman, *ibid.* **31**, 621 (1976).

Erratum: In Deborah Barnes' article "New questions about AIDS test accuracy" (News & Comment, 13 Nov., p. 884), the prevalence for the HIV infection rate in civilians applying for service in the U.S. Army is incorrectly stated. The correct rate is 0.15%, or 1.5 infected people in 1000 tested.