Biochemical Markers

The article "Biochemical markers identify mental states" by Thomas H. Maugh II (Research News, 2 Oct., p. 39) is overstated. While the catecholamine hypothesis of affective disorders (depression and mania) may have some heuristic value for research, it has by no means produced biochemical measures generally useful in the diagnosis and treatment of these disorders. The significance of urinary 3-methoxy-4-hydroxyphenylglycol (MHPG), a metabolite of brain norepinephrine, in diagnosing and treating affective disorders has become increasingly controversial after the initial excitement generated by the early reports, and the connection if any between urinary MHPG and affective state is poorly understood. Lithium's ability to prevent the recurrence of both mania and depression suggests neurochemical processes common to both poles of affective disorder, and this would conflict with the notion of the catecholamine hypothesis that depression is associated with a deficiency and mania with an excess of brain catecholamines.

The article also states that platelet monoamine oxidase may be "a good marker in schizophrenia." Monoamine oxidase levels may have nothing to do with schizophrenia, being related rather to other factors including treatment with neuroleptic medication (*1*).

There is, however, a good laboratory measure in psychiatry not mentioned in the article. The dexamethasone suppression test (*2*) identifies a significant proportion of patients with major (endogenous) depression. These patients have elevated basal blood cortisol levels that are not effectively suppressed by feedback inhibition when challenged with a test dose of dexamethasone.

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References

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2. B. J. Carroll *et al.*, *Arch. Gen. Psychiatry* **38**, 15 (1981).

Maugh appears to clearly imply that the identification of biochemical bases for mental conditions was given its major impetus during the late 1960's by Schildkraut and Maas. If one refers to the papers presented at a symposium held in 1957 (*1*), one finds the types of hypotheses and experimental work referred to in Maugh's article.

Drug treatments for mental illness have been with us for the better part of two decades, and yet we still have drugs that seem to function with the subtlety of a sledgehammer. They can hype up the depressed and slow down the manic. However, the types of delicate perturbations of cognition and mood that would truly be a boon to psychiatry still elude the psychopharmacologists.

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Tesla's Contributions

Eliot Marshall's brief article about Nikola Tesla (News and Comment, 30 Oct., p.523) contains several errors. The first alternating current generators were invented shortly after the discovery of electromagnetic induction in 1830–31, almost a half century before Tesla began to seriously study electricity. Alternating current generators had already been in commercial use in Europe for a decade when Tesla patented his polyphase alternating current motors and the generation-transmission system to make them work. This system was first applied on a large scale at Niagara Falls, but many other hydroelectric plants of various types were by then in existence.

Also, the corporation founded by George (not Edward) Westinghouse in 1888 hired Tesla for a year as consultant (he was never a partner) and bought some 40 Tesla patents that gradually proved invincible in the courts. In 1896, Westinghouse and General Electric settled 300 patent infringement suits pending between them with a cross-licensing (not a "swap") agreement that made General Electric senior partner in an electrical equipment duopoly: this elegant anticompetitive arrangement finally fell afoul of the Sherman Act in 1911, but both firms were by then well entrenched.

Last, Marshall is mistaken in reporting that Tesla never acknowledged the work of James Clerk Maxwell. Tesla did maintain for years that Hertz's work had not provided "experimental verification of the poetic conceptions of Maxwell," but he conceded his error in a 1911 address to the National Electric Light Association. Tesla's stubborness was legend—