more meaningful to say that thirst motivates rats to press the lever to obtain water than it is to say that water motivates rats to press the lever in order to become thirsty. On the other hand, it is meaningful to say that the availability of the combination of thirst plus water can serve as an incentive to motivate even rats that are not thirsty to engage in responses which produce that combination. Thus if the rat is given the thirst it will press for the water; if given the water it will press for the thirst.

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References and Notes

1. M. A. Greer, *Proc. Soc. Exp. Biol. Med.* **89**, 59 (1955); G. J. Mogenson and C. W. Morgan, *Exp. Brain Res.* **3**, 111 (1967).
2. It is interesting to note that the drinking threshold of the R < D rat was more than twice as high as the drinking thresholds of the two D < R rats. It seems likely that its electrode fell close to but just oustide of tissue whose stimulation mediates thirst. Either it was located in tissue whose stimulation mediates reward, or, in the course of raising the current so that it spread into tissue that mediates thirst, it apparently also spread into tissue that mediates reward. The electrodes of the D < R rats probably fell in or very close to tissue that mediates thirst, so that, to induce drinking, it was unnecessary to raise the current to such a high level that it appreciably spread into tissue that mediates reward. Histological analysis of the rats' brains indicated that all the electrodes used in the experiment fell in the perifornical area of the lateral hypothalamus at the level of the anterior part of the ventromedial hypothalamic nucleus. The location of the stimulating tip of the electrode of rat three did not appear to differ grossly from the location of the electrode tips of the other rats. However, the area of the lateral hypothalamus that mediates thirst has not yet been mapped out thoroughly enough to enable us to say whether or not the electrode tip of rat three was in the periphery of this area.
3. Supported in part by NIH grants MH-31258-02 and MH-13253-01.

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Hemoglobin F and Beta Thalassemia

Kreimer-Birnbaum and Bannerman report on a patient with beta thalassemia (*1*). They injected glycine-2-C^{14} and observed that during subsequent days the specific activity of hemoglobin F in the peripheral blood exceeded that of hemoglobin A. Since this result is opposite to our findings in three patients with beta thalassemia, we would like to ask whether this patient received blood transfusion during the period prior to study. Such an introduction of exogenous Hb A would have lowered its specific activity relative to that of Hb F, and this could thus explain the difference between their result and ours.

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1. M. Kreimer-Birnbaum and R. M. Bannerman, *Science* **155**, 1116 (1967).
2. T. G. Gabuzda, D. G. Nathan, F. H. Gardner, *J. Clin. Invest.* **42**, 1678, (1963).

12 April 1967

Our patient with beta thalassemia had received blood transfusions prior to the study, as noted in the clinical description to which we referred (*1*). Transfusions were given at least 30 days and again at 20 days before administration of glycine-2-C^{14}. Gabuzda *et al.* (*2*) are indeed correct in suggesting that exogenous Hb A would have diluted the patient's own Hb A and tended to reduce its specific activity in comparison with Hb F in the earlier part of the study. This is an important point which complicates interpretation, and it may indeed explain the apparent discrepancy between our result and theirs.

After day 50 this dilution would be minimal, and further unpublished data for days 50 to 100 in our patient show that Hb F continued to have a specific activity 1.1 to 1.5 times that of Hb A. During this period, the curves resemble those of Gabuzda *et al.* and their explanation of preferential survival of Hb F is applicable to their curves and ours. We agree that further studies of this kind are needed in β-thalassemia and also in other situations in which there may be heterogeneous metabolism of hemoglobins.

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1. R. M. Bannerman, G. Keusch, M. Kreimer-Birnbaum, V. K. Vance and S. Vaughan, *Amer. J. Med.* **42**, 476 (1967).
2. T. G. Gabuzda, D. G. Nathan, F. H. Gardner, *J. Clin. Invest.* **42**, 1678 (1963).

23 June 1967

The Supernova of 1572

With regard to a recent article by Xi Ze-zong and Po Shu-jen (*1*) that this supernova was observed in China on 8 November, 3 days before Tycho Brahe had done so, the following quotation (*2*) from an observation by Bernard Lindauer (1520–1581), pastor at Winterthur, Switzerland, is interesting.

"On 7 November 1572 a new large bright star has been seen in the sky at Winterthur, equal to the chief (star) of Cassiopeia." The chief star, α Cassiopeia, varies in magnitude from 2.2 to 2.8 with a mean of about 2.4. This would indicate that Lindauer caught the nova on the rise to its maximum magnitude.

A claim by Hageccius from a letter of Paul Fabricius that the nova was already visible at the end of October may have been discounted by Wolf, but, as it seems to have been a slow object, the increase in magnitude might have been somewhat gradual at first. By the time Tycho sighted it, it was as bright as Venus at maximum.

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References and Notes

1. Xi Ze-zong and Po Shu-jen, *Science* **154,** 597 (1967).
2. R. Wolf, *Handbuch der Astronomie, ihrer Geschichte und Literatur* (Schulthess, Zürich, 1892), vol. 2, p. 545. The note in question reads as follows: "Natürlich war Tycho nicht der einzige, ja er war nicht einmal der erste Beobachter des Wundersternes von 1572; denn wenn man auch der vereinzelten, von Hageccius in seine 'Dialexis de novæ et prius incognitæ stellæ apparitione. Francof. 1574 in 4.' aus einem Briefe von Paul Fabricius aufgenommenen Angabe, es sei die Nova schon Ende Oktober gesehen worden, kein Gewicht beilegen will, so findet sich in den von Bernhard Lindauer (Bremgarten 1520-Winterthur 1581; Pfarrer in Winterthur) hinterlassenen 'Annalibus' die ganz bestimmte Angabe: 'A. 1572 den 7. Nov. ist am himmel ein neuwer grosser heiterer stern gesehen worden zu Winterthur, gleich ob dem haubt Cassiopeæ'. . . ."

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