ness discrimination at or above criterion levels, regardless of whether the brightness discrimination testing was conducted before or after the pattern discrimination testing and regardless of the order in which the eyes were trained and tested in the two discriminations.

These results are shown in Fig. 1. Inspection of the learning curves for pattern discrimination with each eye shows that the "split-brain" cat essentially relearns with the untrained eye. Furthermore, the course and rate of the learning with the untrained eye closely approximates that of the initially trained eye. Pattern-discrimination learning is impaired in both eyes, however, for when compared to the monocular learning of the unoperated cat, the "split-brain" cat requires 2 to 5 times more trials to reach criterion. Brightness discrimination, on the other hand, not only transfers completely from one eye to the other in the "split-brain" cat, but learning of the discrimination proceeds about as rapidly in this cat as in the normal cat restricted to monocular vision.

Because the four animals reported in this experiment are still being tested in other visual problems, the extent of their lesions has not yet been determined. Nevertheless, these results demonstrate that in cats with mid-sagittal section (of undetermined completeness) of the optic chiasm and the corpus callosum, a simple, suprathreshold brightness discrimination will transfer interocularly whereas a pattern discrimination will not. This suggests either that in cats the corpus callosum is not essential in mediating the transfer of a simple brightness discrimination or that less functional corpus callosum is necessary for brightness transfer than for pattern transfer.

Smith (*5*) has reported that simple brightness discriminations can be performed in the cat after ablations of the striate cortex; this indicates the capabilities of undetermined other cortical or subcortical structures in visual discriminations. Bridgman and Smith (*6*), however, have shown that with brightness discriminations at or near threshold levels in the cat, the striate cortex is involved and thus is essential for critical performance at these levels. Hence, if the chiasmal and callosal sections are complete in the animals reported here, the present results indicate that a simple, suprathreshold brightness discrimination is transferred by undetermined subcallosal commissures. Therefore, the corpus callosum may be essential only for the transfer of brightness discriminations at or near threshold, a cortically dependent visual function.

These interpretations suggest two sequel experiments which are now in progress utilizing "split-brain" cats: (i) testing interocular brightness discrimination transfer near threshold levels, and (ii) testing interocular brightness discrimination transfer after additional subcallosal midline-sections of other commissures (*7*).

THOMAS H. MEIKLE
JERI A. SECHZER
Institute of Neurological Sciences, University of Pennsylvania, Philadelphia

References and Notes

1. R. W. Sperry, J. S. Stamm, N. Miner, *J. Comp. and Physiol. Psychol.* **49**, 529 (1956); R. E. Myers, *Brain* **79**, 358 (1956); ———, *Arch. Neurol.* **1**, 74 (1959); J. L. deC. Downer, *Federation Proc.* **17**, 37 (1958).
2. A. M. Schrier and R. W. Sperry, *Science* **129**, 1275 (1959).
3. R. E. Myers, *J. Comp. and Physiol. Psychol.* **48**, 470 (1955).
4. L. W. Gellerman, *J. Genet. Psychol.* **42**, 206 (1933).
5. K. U. Smith, *ibid.* **51**, 329 (1937).
6. C. S. Bridgman and K. U. Smith, *Am. J. Physiol.* **136**, 463 (1942).
7. This work was supported by U.S. Public Health Service grant 2B-5273. The authors are indebted to Dr. Eliot Stellar for his advice throughout this experiment.

17 June 1960

On the Reported Inhibition of Monoamine Oxidase by an Agent with Sedative Properties

Abstract. 1-Benzyl-2-methyl-5-methoxytryptamine has been reported, on the basis of indirect evidence, to inhibit monoamine oxidase. More direct experiments, however, demonstrate that the drug is devoid of the ability to block monoamine oxidase in brain in vitro or in vivo.

Considerable evidence supports the hypothesis that the antidepressant action of monoamine oxidase inhibitors is associated with their ability to inhibit the enzyme in brain (*1*). Based on this hypothesis there have been developed a number of potent monoamine oxidase inhibitors (for example, iproniazid, phenylisopropylhydrazine, phenelzine, nialamide) for the treatment of depressed mental conditions. Feldstein *et al.*, in a recent report (*2*), question whether the antidepressant effect produced by such compounds is related to inhibition of monoamine oxidase. Their objection to this view is based on evidence that 1-benzyl-2-methyl-5-methoxytryptamine (BAS), though a sedative agent, blocks monoamine oxidase. As evidence that this sedative agent inhibits monoamine oxidase they reported that the pretreatment of schizophrenic patients for 1 to 2 weeks with about 1.5 mg of the drug per kilogram per day prevented the expected rise in urinary 5-hydroxyindoleacetic acid after the administration of DL-5-hydroxytryptophan. They concluded that their data cast doubt upon the hypothesis that there is an association between the central stimulatory effects of monoamine oxidase inhibitors and their ability to inhibit monoamine oxidase. However, they also reported that BAS did not reduce the excretion of endogenously formed 5-hydroxyindoleacetic acid. In view of the nature of their indirect and contradictory evidence we undertook to determine by direct means whether the sedative blocks the activity of brain monoamine oxidase.

Previous studies have shown that iproniazid and other potent monoamine oxidase inhibitors interfere with the destruction of serotonin and norepinephrine in rabbit brain, thereby causing a two- to threefold elevation in the levels of these amines (*1*). 1-Benzyl-2-methyl-5-methoxytryptamine was given intravenously to rabbits in daily doses of 1 to 2 mg/kg for 10 days. The levels of the brain amines, as measured by previously described techniques (*3*), were not increased over the normal values during the 10 days of drug administration. Increasing the daily dose of the sedative to 25 mg/kg also failed to elevate the levels of these brain amines.

The inhibitory action of BAS on monoamine oxidase in vitro was assayed by its effect on the metabolism of serotonin added to rabbit brain homogenates (*4*). At concentrations as high as $10^{-4}M$ BAS failed to inhibit monoamine oxidase; contrastingly, iproniazid at $10^{-4}M$ or β-phenylisopropylhydrazine at $10^{-6}M$ completely suppressed the activity.

These results indicate that 1-benzyl-2-methyl-5-methoxytryptamine has little or no activity as an inhibitor of brain monoamine oxidase in vitro or in vivo. It is not surprising, therefore, that the compound does not show antidepressant properties (*5*).

SYDNEY SPECTOR
PARKHURST A. SHORE
BERNARD B. BRODIE
National Heart Institute, Bethesda, Maryland

References and Notes

1. "Symposium on amine oxidase inhibitors," *Ann. N.Y. Acad. Sci.* **80**, 551 (1959).
2. A. Feldstein, H. Hoagland, H. Freeman, *Science* **130**, 500 (1959).
3. D. F. Bogdanski, A. Pletscher, B. B. Brodie, S. Udenfriend, *J. Pharmacol. Exptl. Therap.* **117**, 82 (1956); P. A. Shore and J. S. Olin, *ibid.* **122**, 158 (1958).
4. A. Sjoerdsma, T. E. Smith, T. D. Stevenson, S. Udenfriend, *Proc. Soc. Exptl. Biol. Med.* **89**, 36 (1955).
5. We are grateful to Dr. D. W. Woolley, Rockefeller Institute, and to Dr. Gilbert M. Bayne, Merck Sharp & Dohme Research Laboratories, for supplying us with samples of BAS.

2 June 1960