Clearly, then, many and perhaps most of the undesired analyses could be suppressed, with a consequent large decrease in computer running time, by deleting those homographs that are inappropriate for the text being run. This was done on a word-by-word basis in sentences 2, 8, and 10.

With the augmented text (*6*) thus modified, sentence 10 was run, and, as indicated in Table 1, only one analysis was produced. It was also meaningful, and corresponded to the intended interpretation of the sentence. The running time on the computer was satisfactorily short. Subsequently, it was decided to rerun sentence 2 and also to run sentence 8. This resulted in two analyses for each of the sentences. Again, the computer running time was satisfactorily short. It is particularly noteworthy that the editing of the augmented text reduced the running time of sentence 2 by a factor of 8.

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References and Notes

1. "Current Research and Development in Scientific Documentation," *National Science Foundation Rept. NSF 62-20* (May 1962).
2. R. Stern, "Syntactic ambiguity in the Clayton Act," *Modern Uses of Logic in Law* Sect. 5(a) (Dec. 1960), p. 129; J. C. Miller, "Two examples of syntactic ambiguities in international agreements," *ibid.* (June 1962), p. 72; J. H. Ely, "The limits of logic," *ibid.* (Sept. 1963), p. 117; V. Fiordalisi, "Progress and problems in application of electronic data processing systems to legal research," *ibid.* (Dec. 1960), p. 174.
3. Developed at Harvard University by S. Kuno and A. Oettinger with National Science Foundation sponsorship. See "Mathematical Linguistics and Automatic Translation," *National Science Foundation Rept. NSF 8* (January 1963) and *NSF 9* (May 1963), 1 and 2.
4. We thank Mr. Susumu Kuno of the Harvard Computation Laboratory for assisting us with details of the dictionary update and certain of the program operating features.
5. "Mathematical Linguistics and Automatic Translation," *National Science Foundation Rept. NSF 9* (May 1963), vol. 1, p. 127.
6. That text actually used by the analyzer in which each word of a sentence appears with all its dictionary homographs.

2 October 1964

Visual-Cliff Experiment with Mothered and Unmothered Lambs

In their report "Depth perception in sheep" (21 Aug., p. 835), Lemmon and Patterson conclude that "some unspecified elements in the mother-neonate relationship are closely related to the development of perceptual skills, particularly depth perception, as well as subsequent adjustive avoidance behavior."

Another interpretation should first be considered, however. Imprinting has been reported in sheep. The hours shortly after birth are critical in the establishment of the bond between mother and lamb, and with increasing age fear of strange objects appears. Thus in Lemmon and Patterson's experiment 1, mothered lambs become increasingly attached to their mothers and fear increases. It is almost certain that the lambs are aware of the observer 1 meter away in the only direction in which they can move; this "insures" that they will remain on the platform. In the unmothered, better called hand-raised, group, a bond with humans becomes established; during the test the presence of the human would elicit approach in spite of the visual cliff. The strangeness of the situation is not the same for both groups.

Since the results can be predicted on the basis of an imprinting hypothesis, this question needs further study.

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Klinghammer's objection to the control of extraneous stimulation in the visual cliff would be well taken if it were possible for the animal in the apparatus to see the experimenter. Lambs from both groups were placed on the platform through a flap in the top of the box directly over the "solid" platform. The flap was then closed and the animals' behavior observed through an unobtrusive peephole in the other end. The conditions of the experimental situation were reasonably neutral as regards sound and obvious olfactory stimuli.

It is most likely that none of the animals was capable of fear; Scott [*Animal Behavior*, University of Chicago Press (1958)] has pointed out that the lamb's capacity to discriminate its own mother from other ewes takes some time to develop and is apparently dependent upon being butted away by animals other than its own mother. This phenomenon has also been reported by Hersher, Richmond, and Moore [*Behavior*, E. J. Brill, Leiden, Netherlands (1963); *Maternal Behavior in Mammals*, Wiley, New York (1963)]. Our unmothered animals were not encouraged to follow a human and were kept in warm pens after feeding and cleaning—with other lambs of comparable age. Mothered lambs were kept in the same building in separate stalls limited to ewe-lamb pairs. There was no obvious difference in the response of ungoggled lambs to human attendants, whether or not they remained with their mothers.

If, as Klinghammer suggests, the mothered lambs were motivated by fear when placed in the experimental situation they, even more readily than unmothered lambs, should have moved away from the "solid surface" under the flap, since this would put them even farther away from their last view of the experimenter. They did exactly the opposite.

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