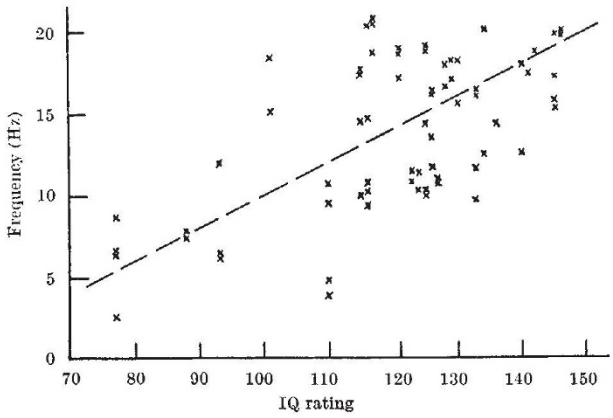

Fig. 2. Scatter diagram of test results.

abscissa is the score obtained on the Wechsler adult intelligence scale for each individual. The coefficient of correlation for these results was computed to be 0·593 by the Pearson product-moment method.

A correlation of this value is generally considered indicative in psychology. Only the frequency of the major damped sinusoid has been considered in this analysis. On a qualitative examination, there was generally less damping with the lower frequency responses. A more complete analysis of the evoked responses, incorporating the effects of damping, would probably improve the correlation. Because these data were collected under unshielded conditions, the accuracy of the measurements does not justify additional analysis. A shielded room for the subjects will be used in future investigations.

A correlation of unity with an IQ test could not be expected for this type of test. The IQ test is intended to measure all aspects of intelligence, including memory and environmental effects, whereas this work measures only the electrical characteristics of the visual pathway.

I thank Dr H. Weinberg, Simon Fraser University, and the British Columbia Institute of Technology for their assistance. Dr Weinberg's experimental work was supported by NRC and MRC grants.

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Received May 13; revised October 8, 1968.

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Imprinting in Guinea-pigs

Classical imprinting of precocial birds has been studied in the laboratory for some 20 years. Suggestions have also been made over a similar period about the imprinting of precocial mammals, but no systematic experiments specifically concerned with imprinting have been reported so far. Although Shipley's study of guinea-pigs[1] referred to imprinting, in reality it was concerned with the approaches and following responses of these animals to moving objects. Imprinting involves more than that, namely an attachment to a given figure, and this can be readily assessed in a discrimination test[2]. The experiment reported here describes imprinting in young guinea-pigs, judged in terms of the animals' preference for familiar, compared with strange, objects.

Twenty-four guinea-pigs which were born in the laboratory were taken away from their mothers at 5–7 days of age. From then on the animals were housed individually in pens measuring $20 \times 20 \times 30$ cm, and were fed with Oxoid *SG*1 pellets; water was freely available. In these conditions, starting on the first day, each animal was taken out of its pen for 1 h each day, and was placed in a runway $61 \times 30 \times 28$ cm deep, within which was an object. In some cases this was a striped black and white cube measuring 5·4 cm, and in others it was a tennis ball—mounted near one end of the runway and moving about with a circular motion (radius approximately 2·5 cm) at a rate of ten revolutions/min. While the animal was in the runway with the moving object, it was without food or water. The animal was exposed to the object in this way on 4 successive days. During the exposure trials, the animals almost invariably faced the object, and in most cases also sniffed at it, or attempted to bite it, squeaking most of the time and often moving round it.

On the fifth day (10–12 days after birth) each guinea-pig was tested in a similar runway for choice between the cube and the ball. These objects were now mounted at the opposite ends of the runway and were moving as before. The animal was placed midway facing a long wall (and neither object) for 10 min, and a protocol record of its behaviour was made by the experimenter. At the end of the 10 min the animal was taken out of the runway and immediately put in again, now facing the other long wall, for another 10 min. Again its behaviour was continuously observed and described.

The protocols could be easily scored because, with two exceptions, each animal almost immediately moved towards the familiar object and stayed by it throughout both the first and the second half of the test. Only one animal ("trained" with the cube) remained in the middle of the runway (though facing the cube), and only one other animal ("cube-trained") ran back and forth (though it stayed longer by the cube). Regarding these two as having made no definite choice, the results are summarized in Table 1.

Table 1

	Ball	Cube	Neither
Numbers of animals with previous experience of cube which chose:	0	9	2
Numbers of animals with previous experience of ball which chose:	13	0	0

It is clear that experience with a suitable object without any conventional reinforcement strongly predisposed the young guinea-pigs to prefer this object to another, even when tested a day after the last exposure trial. Moreover, such imprinting occurred in animals which had had several days' experience of their mother before receiving any experience with the cube or the ball. Typical imprinting of young birds, however, occurs in "naive" subjects, soon after hatching (although there is evidence that the effects of such imprinting may be reversed[3,4]). Thus it is interesting that not only can imprinting-like behaviour occur in a mammalian species, but it can also be observed in animals which must already be strongly attached to another figure, the mother. The fact that such later imprinting can take place suggests that much further research is needed to determine the sensitive periods, if any, for this and other forms of early learning in guinea-pigs as well as in other precocial mammals.

I thank Mr Dugald MacArthur for constructing the apparatus, and Miss Elizabeth Tetlow for collecting most of the data.

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Received October 1; revised October 25, 1968.

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