ter. (ii) Diethylstilbestrol-pellet implantation during the fattening period appears to influence adversely carcass quality. (iii) Implanted animals may exhibit undue restlessness or abnormal sexual activity, such as "mounting." (iv) Some animals may exhibit toxicity symptoms from pellets.

The results obtained in the current experiments indicate that oral administration of diethylstilbestrol produces the desirable effects of pellet implantation without any of the undesirable side effects. The ease with which this material can be supplied to cattle by incorporating it in their feed is an important advantage. Also, the material can be easily removed from the rations of cattle should errors be made in amounts administered, or other unforeseeable situations develop. Still another advantage of the oral method of administering diethylstilbestrol is the ease with which a constant daily intake of an extremely small amount can be supplied to cattle over a feeding period of any given length of time. In contrast to this last advantage, when diethylstilbestrol is implanted as a pellet, the rate of release of the active material cannot be adequately controlled, and thus it may be released too rapidly initially and too slowly in the latter part of the feeding period for best results.

In conclusion, the placing of trace amounts of diethylstilbestrol in the feed of fattening steers increased live-weight gains as much as 35 percent over control animals not receiving diethylstilbestrol and reduced feed costs per unit of gain as much as 20 percent. No reduction in the fatness of the cattle or in the quality of the meat produced was noted when the diethylstilbestrol was incorporated in the steer feeds.

Reference

1. J. F. Sykes *et al., National Research Council Publ. No. 266* (1953), p. 31.

January 28, 1954.

A Note on a Chemographic Artifact in Autoradiography

L. E. Preuss and C. Harrison

Edsel B. Ford Institute for Medical Research
Detroit, Michigan

Boyd and Board (*1*) have defined the histochemograph as a gross image or grain grouping produced by chemical action when a specimen is in contact with the emulsion (*2*). Fitzgerald *et al.* (*3*) apply the term *pseudophotographic* to agents, other than radiation, that will reduce the photographic emulsion. Such artifacts have been found superimposed upon autoradiographs of Cr^{51} and Au^{198} plaques.

These chemographs corresponded to the debris dusted on the emulsion from a conventional lead pencil that was used to mark the emulsion near the autoradiograph. They were first observed on medium lantern slide emulsion that was used for the production of gross autoradiographs of very thin metallic films

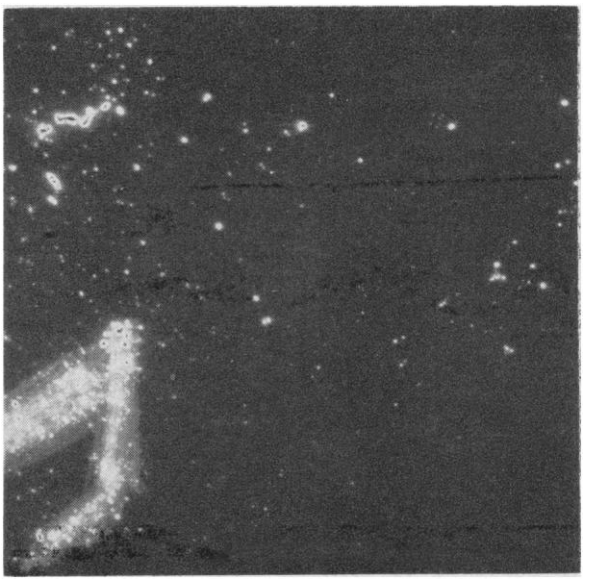

Fig. 1*a*. Appearance in dark field, showing the dispersion of the chemographic agent from the pencil mark at the left. Note the typical "halo" effect of the chemographs superimposed on the pencil mark.

of Cr^{51}, which was exposed for 1 mo at room temperature and developed in D-72 at 20°C for 3.5 min. The area on which the pencil-chemographs appeared was not submitted to pressure during the exposure. The

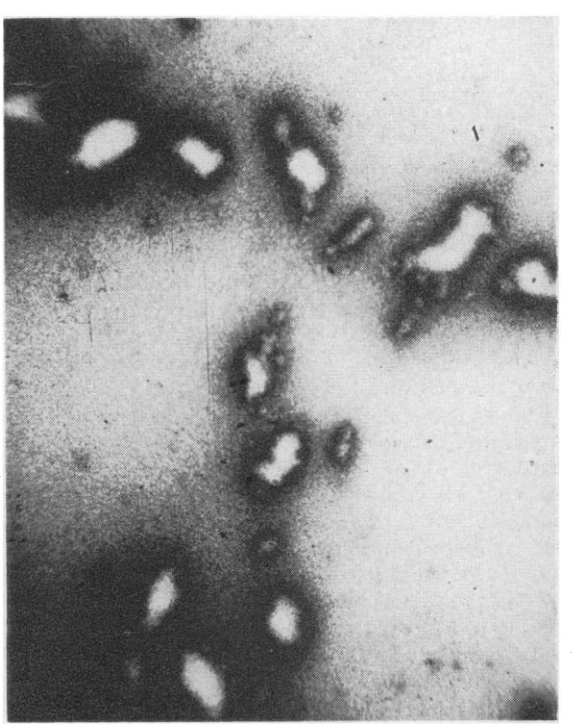

Fig. 1*b*. View in bright field at × 30, clearly demonstrating the absence of developed grains in the central area. The silver grain is represented here as a black region.

pencil marking was the source of the contaminant and fine debris was occasionally observed to sift from the mark. Grossly this chemograph is indistinguishable from an autoradiograph and, under magnification, resembles autoradiographs made by fine radioactive particulate material except for a characteristic nonreduced center area.

P. J. Fitzgerald has observed similar reduced areas apparently made by debris produced by the cutting of MLS plates (*4*). The pencil was of about 5B hardness

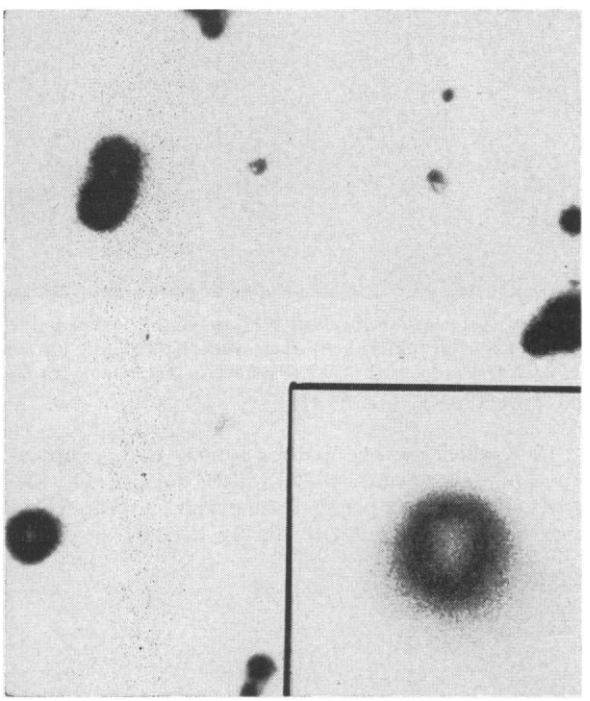

Fig. 2. A small group of chemographs at ×29 demonstrates the size distribution. The insert at ×50 shows the halo effect evident in one of the smaller grain groups. Both are in bright field.

and was of the type custom produced in quantity. However, the artifact was found with only one pencil type. Several pencil brands of different degrees of hardness were tested by varying exposure, development, and marking technique.

Figure 1*a* at ×2.7 in dark field presents the gross appearance of several areas rendered developable by debris from the pencil mark that is shown in part on the left. Figure 1*b* in bright field at ×30 shows striking examples of the clear central area. Figure 2 at ×29 gives the morphology and dispersion of grain groups with the desensitized central area less apparent; the insert, however, at ×50 shows that the "donut" configuration does exist in these chemographs. This structure correlates with the histochemographs of Boyd and Board from rat bone-marrow smears.

The artifacts described here are atypical of the usual pseudophotographic effects found by Fitzgerald. They are not superficial but extend through the emulsion and do not exactly circumscribe the source, but rather the grain concentration decreases with distance from the center. The clearness of the central area varies but suggests desensitization particularly in the larger chemographs where the effect is easily observed. The grain-grouping diameter ranged up to 1 mm, and the size of the artifact presumably was roughly related to the particle size of the reducing agent. The central desensitized area diameter was usually proportional to the total size of the "donut-like" artifact. Occasionally a "smear" of grains point back to the original mark showing the track of the reducing agent across the emulsion. These artifacts have been found up to 20 cm away from the pencil mark. The very fine particulate nature of the reducing agent allows for easy transport. Fitzgerald has also observed the rarer cell chemographs indistinguishable from the autoradiographs in which the grain concentration decreases with distance from the center (*4*).

In view of these findings, markings of autoradiographs with pencil should be discouraged, particularly where the gross apposition technique is employed and especially where the specimen is likely to incorporate fine particulate radioactive material, autographs of which may be confused with the pencil chemograph.

References

1. G. A. Boyd and F. A. Board, *Science* **110**, 586 (1949).
2. F. A. Board, *J. Cellular Comp. Physiol.* **38**, 377 (1951).
3. P. J. Fitzgerald *et al.*, *Laboratory Investigation* **2**, No. 3 (May–June, 1953).
4. P. J. Fitzgerald, private communication.

January 26, 1954.

Sperm Storage at Lower-than-Body Temperature Outside the Body Cavity in Some Passerine Birds

Albert Wolfson

Department of Biological Sciences, Northwestern University, Evanston, Illinois

In most mammals the testes are located in the scrotum outside the body cavity. Moore has demonstrated conclusively the thermoregulatory function of the scrotum and its necessity for the production of mature germ cells (*1*). The temperature of the scrotum in common laboratory animals and in man is approximately 5° to 9° (F) lower than body temperature. In birds the testes are abdominal and the body temperatures are, in general, much higher than in mammals. In view of the need for a lower temperature for normal spermatogenesis in mammals, the condition in birds is of great interest.

During the course of our studies on the relation of photoperiod to the reproductive cycle, we noted an extensive development of the cloacal region at a specific time in the cycle. Further study of this cloacal protuberance showed that it was produced largely by the growth and coiling of the lower ends of the male ducts (*vasa deferentia*). Each enlargement was nodular in form. When fully developed the appearance of the two "nodules" on the posterior wall of the cloaca