

membrane and decreased sweating of the foot pads. The blood pressure is generally slightly elevated and the pressor response to afferent stimuli is reduced. The reflex (inhibitory) dilatation of the sympathectomized pupil is increased. The "damping" effects were generally reduced following ligation of both adrenals. They could be overcome by small injections of metrazol which, according to our previous investigations,³ greatly accentuates sympathetic responses. In like manner hyperreflexia induced by metrazol could be reduced by injecting adrenalin. The action of adrenin liberated under various conditions in the narcotized animal is similar to that of adrenalin perfusion.

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Control of "Nose-Picking" Form of Cannibalism in Young Closely Confined Quail Fed Raw Meat.*

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When young quail are kept crowded together, in considerable numbers, in very small brooder pens, they soon develop the "nose-picking" form of cannibalism. It may start at any age from about the second up to the sixth or seventh week. It seldom or never starts after the eighth week; or, if it has already started, it usually stops at about that time.

One or more birds (usually the larger and stronger ones) start pecking the upper bills of other birds (usually the smaller and weaker ones). The nostril is the point of injury. The wound is small and superficial at first but it is enlarged and deepened from the repeated picking by the offending bird or birds, until, within 2 or 3 days, it is quite serious. This weeping and bleeding wound invites further injury. The bill at this point may be cut half through. The victim is in pain, droops around, eats and drinks very little and becomes weak. The weaker he grows the more the other birds attack him. Usually he is soon trampled and smothered to death by the other stronger birds. Within a few days a large percent of all the birds in

³ Gellhorn, E., and Darrow, C. W., in press.

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the pen may be injured. If nothing is done to stop it, most of them may die. Birds that recover usually have badly deformed bills and are worthless for breeders.

This trouble occurs only when the quail chicks are brooded in artificial brooders. It does not occur if they are kept in large pens, especially if the pens are on the ground where there is plenty of trash and litter for them to pick at and scratch in.

Many quail breeders believe this form of cannibalism is due to some fault or deficiency in the diet. Animal protein is thought to be the element needed and an attempt to supply the deficiency is made by including in the feed mixture varying proportions of dried meat meal, fish meal or milk products. However, no diet heretofore employed has been found adequate to entirely prevent the trouble whenever the birds are closely confined and crowded in the brooder pens.

For experimental purposes I have used wire bottom pens, 15"x21", in which from 25 to 50 birds are kept through the period during which this form of cannibalism occurs. Under such very crowded conditions they always develop "nose-picking" and all but a few of the entire lot are finally killed. Several different commercial game bird or poultry feeds have been tried; and also feeds which I have made up according to different formulæ. None of them prevents the trouble. On the other hand, I have found that if, in addition to their other feed, the birds are given all the raw meat they will eat, and a plentiful supply is kept before them all the time, "nose-picking" does not occur; or, if it has already started, it soon stops. Ground beef was found effective for this purpose.

It is sometimes necessary to withhold all other food temporarily, to force the birds to eat enough raw meat to prevent this form of cannibalism; especially to control it after it has already started. Birds of this age, once they learn the taste of it, eat the raw meat ravenously and will consume even more than grown quail, although they are only about one-fifth as large.