

1532 University Ave.  
April 7, 1936

Mr. Herbert L. Stoddard  
Sherwood Plantation  
Thomasville, Georgia

Dear Herbert:

After receiving the replies from yourself, McAtee and Errington on the food selection project, I was pretty well convinced that I had better do some thinking before publishing such a raw piece of material. I am not sure that the attached revision even yet says much of anything, but I think it is better than the other. I await word from all three of you as to whether it is worth putting out.

I think your idea of weathering as a possible determiner of palatability is the newest and best thing I have heard for some time. It is so good that if you are going to develop it yourself, I would rather not mention it. On the other hand, if you are not going to develop it at an early date, it might do a lot of good to put the raw notion in people's minds.

As you have seen, I played safe <sup>in the last news letter</sup> by substituting for this project some ABC stuff on deer.

Yours sincerely,

Aldo Leopold  
Professor of Game Management

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Encl.

## Needed Researches

### No. 2. Food Selection

Up to a decade ago, the presence of a food item in a crop was accepted as evidence of food value. The researches of Stoddard and Errington have now shown that quantities of a low-palatability food, such as sweet clover, may indicate impending starvation. There has evolved a theory of "palatability sequence" which postulates that available foods are eaten in the order of their palatability. Winter survival is conceived to be a question of how low on the scale the bird has been forced to descend. A growing body of food habits research is premised on this theory. These data seem to have the merit of considerable internal consistency.

The palatability sequence, however, can hardly be, in and of itself, a rounded concept of food selection, especially in birds. What is palatability, anyhow, in a bird devoid of taste buds: through what alternative physiological mechanisms could food-selection be exercised? Whatever palatability is, it is assumed to be a measure of sustenance-value. Is this a valid assumption? What species other than quail show a definite sequence? What seasons other than winter? What is the meaning of the small quantities of "low-grade" foods found in crops ~~at all crops~~ at all seasons? Are the postulates of "pastime" foods, condiment foods, and tonic foods sufficient to explain these exceptions?

¶ Why do sharptails start budding in January, corn or no corn? Why do some sorghums seem to become unpalatable as the winter advances? Are these shifts in the chemistry of the food or in the needs of the bird? Why do the conclusions drawn from experimental feedings to a given bird often differ from each other and from conclusions drawn from wild crops? ¶ While the accumulating data have much internal consistency, they do not have enough to silence these seeming contradictions. Stoddard advances the theory that palatability may change with weathering or exposure. This is probably a sample of <sup>the kind of thinking</sup> ~~what is~~ needed to round out the palatability theory in birds.

In mammals, the inherent difficulties are less because the mechanism of selection is similar to our own. Nevertheless plenty of basic work awaits the investigator. Why do deer prefer browse growths from spots already over-browsed? Why do they distinguish between different geographic races of the same plant grown in the same spot? Why does balsam rate as a low-grade browse in one region and staple in another? All such questions suggest a clear field for the plant chemist.

Not so clear is the still unsupported hypothesis that the cycle common to bark and bud eaters may be induced by vitamin deficiencies in such foods, in turn induced by fluctuating radiation. If this theory is ever supported by experimental evidence, the bottom of the food selection problem will recede another mile.

A critical study of inhibitions, inherent or acquired, against toxic foods might illuminate the mechanism of food selection. Likewise a critical study of acquired traits, such as Errington's finding that young quail must learn to open unhusked corn, and Stoddard's finding that quail unfamiliar with rice and buckwheat must learn to eat them.

Work in this field involves a synthesis of ecology and physiology, and requires advance training in both. Extra strong consulting facilities in animal nutrition and agricultural chemistry are obviously requisite. With all its limitations, the experimental method seems the most promising vehicle for progress. Compilation of the literature alone would make a thesis.