

Natural History, the Forgotten Science

ONE SATURDAY night a few weeks ago two middle-aged farmers set the alarm clock for a dark hour of what proved to be a snowy, blowy Sunday. Milking over, they jumped into a pick-up and sped for the sand counties of central Wisconsin, a region productive of tax deeds, tamaracks, and wild hay. In the evening they returned with a truck full of young tamarack trees and a heart full of high adventure. The last tree was planted in the home marsh by lantern-light. There was still the milking.

In Wisconsin “man bites dog” is stale news compared with “farmer plants tamarack.” Our farmers have been grubbing, burning, draining and chopping tamarack since 1840. In the region where these farmers live the tree is exterminated. Why then should they want to replace it? Because after twenty years they hope to re-introduce sphagnum moss under the grove, and then ladyslippers, pitcher plants, and the other nearly-extinct wildflowers of the aboriginal Wisconsin bogs.

No extension bureau had offered these farmers any prize for this utterly quixotic undertaking. Certainly no hope of gain motivated it. How then can one interpret its meaning? I call it Revolt—revolt against the tedium of the merely economic attitude toward land. We assume that because we had to subjugate the land to live on it, that therefore the best farm is the one most completely tamed. These two farmers had learned from experience that the wholly tamed farm offers not only a slender livelihood but a constricted life. They had caught the idea that there is pleasure to be had in raising wild crops as well as tame ones. They propose to devote a little spot of marsh to growing native wildflowers. Perhaps they wish for their land what we all wish for our children—not only a chance to make a living, but also a chance to express and develop a rich and varied assortment of inherent capabilities, both wild and tame. What better expresses land than the plants which originally grew on it?

I am here then to talk about the pleasure to be had in wild things, about natural history studies as a combination sport and science.

History has not conspired to make my task an easy one. We naturalists have much to live down. There was a time when

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ladies and gentlemen wandered afield not so much to learn how the world is put together as to gather subject matter for tea-time conversation. This was the era of dickey-bird ornithology, of botany expressed in bad verse, of ejaculatory vapors such as "ain't nature grand." But if you will scan the amateur ornithological or botanical journals of today you will see that a new attitude is abroad. I shall not try to define it, but rather to describe to you some people who exemplify it. In selecting these people I shall include only amateurs—that is to say, I exclude all who receive either pay or university credit for their natural history work.

I know an industrial chemist who spends his spare time in reconstructing the history of the passenger pigeon and its dramatic demise as a member of our fauna. The pigeon became extinct before this chemist was born, but he has dug up more knowledge of pigeons than any contemporary possessed. How? By reading every newspaper ever printed in our state, as well as contemporary diaries, letters, and books. I estimate that he has read 100,000 documents in his search for pigeon data. This gigantic labor, which would kill any man undertaking it as a task, fills him with the keen delight of a hunter scouring the hills for scarce deer, of an archeologist digging up Egypt for a scarab. And of course such an undertaking requires more than digging. After the scarab is found its interpretation requires the highest skill—a skill not to be learned from others, but rather created by the digger as he digs. Here, then, is a man who has found adventure, exploration, science and sport, all in the backyard of current history where millions of lesser men find only boredom.

Another exploration—this time literally of a back yard, is a study of the Song Sparrow conducted by an Ohio housewife. This commonest of birds had been scientifically labelled, pigeon-holed a hundred years ago, and forthwith forgotten. Our Ohio amateur had the notion that in birds, as in people, there are things to be known over and above name, sex, and clothes. She began trapping the song sparrows in her garden, marking each with a celluloid anklet, and being thus able to identify each individual by its colored marker, to observe and record their migrations, feedings, fightings, singings, matings, nestings and deaths; in short, to decipher the inner workings of the sparrow community. In ten years she knew more about sparrow society, sparrow politics, sparrow economics, and sparrow psychology

than anyone had ever learned about any bird. Science beat a path to her door. She has published the first volume of a monograph on her backyard researches. Ornithologists of all nations seek her counsel.

These two amateurs happen to have achieved fame, but no thought of fame motivated their original work. Fame came *ex post facto*. It is not fame, however, that I am talking about. They achieved personal satisfactions which are more important than fame, and hundreds of other amateurs are achieving these satisfactions. I now ask: What is our educational system doing to encourage personal amateur scholarship in the natural history field?

We can perhaps seek an answer to this question by dropping in on a typical class in a typical zoology department. We find there students memorizing the names of the bumps on the bones of a cat. It is important, of course, to study bones, otherwise we should never comprehend the evolutionary process by which animals came into existence. But why memorize the bumps? We are told that this is part of biological discipline. I ask, though, whether a comprehension of the living animal and how it holds its place in the sun is not an equally important part. Unfortunately the living animal is virtually omitted from the present system of zoological education. In my own university, for example, we offer no course in ornithology or mammalogy.

Botanical education is in like case, except perhaps that the displacement of interest in the living flora has been not quite so extreme.

The reason for this eviction of outdoor studies from the schools goes back into history. Laboratory biology came into existence at about the time when amateur natural history was of the dickey-bird variety, and when professional natural history consisted of labelling species, and amassing facts about food habits without interpreting them. In short, a growing and vital laboratory technique was at that time placed in competition with a stagnated outdoor technique. It was quite natural that laboratory biology soon came to be regarded as the superior form of science. As it grew it crowded natural history out of the educational picture.

The present educational marathon in memorizing the geography of bones is the aftermath of this perfectly logical process of competition. It has, of course, other justifications: medical

students need it. Zoology teachers need it. But I contend that the average citizen does not need it as badly as he needs some understanding of the living world.

In the interim, field studies have developed techniques and ideas quite as scientific as those of the laboratory. The amateur student is no longer confined to pleasant ambles in the country resulting merely in lists of species, lists of migration dates, and lists of rarities. Bird banding, feather-marking, censusing, and experimental manipulations of behavior and environment are techniques available to all, and they are quantitative science. The amateur can, if he has imagination and persistence, select and solve actual scientific natural history problems as virgin as the stratosphere. My two amateurs are cases in point.

The modern view is not to regard laboratory and field as competitive, but rather as complementary studies. Curricula, however, do not yet reflect this new situation. It takes money to enlarge curricula, hence the average college student who inclines toward natural history avocations is rebuffed rather than encouraged by his university. Instead of being taught to see his native countryside with appreciation and intelligence, he is taught to carve cats. Let him be taught both if this is possible, but if one must be omitted let it be the latter.

To visualize more clearly the lop-sidedness and sterility of biological education as a means of building citizens, let's go afield with some typical Phi Beta Kappa student and ask him some questions. We can safely assume he knows how angiosperms and cats are put together, but let us test his comprehension of how Missouri is put together.

We are driving down a country road in northern Missouri. Here is a farmstead. Look at the trees in the yard and the soil in the field and tell us whether the original settler carved his farm out of prairie or woods. Did he eat prairie chicken or wild turkey for his Thanksgiving? What plants grew here originally which do not grow here now? Why did they disappear? What did the prairie plants have to do with creating the corn-yielding capacity of this soil? Why does this soil erode now but not then?

Again, suppose we are touring the Ozarks. Here is an abandoned field in which the ragweed is sparse and short. Does this tell us anything about why the mortgage was foreclosed? About how long ago? Would this field be a good place to look

for quail? Does short ragweed have any connection with the human story behind yonder graveyard? If all the ragweed in this watershed were short, would that tell us anything about the future of floods in the stream? About the future prospects for bass or trout?

I fear that our Phi Beta Kappa biologist would consider these questions insane, but they are not. Any amateur naturalist with a seeing eye should be able to speculate intelligently on all of them, and have a lot of fun doing it. You will see, too, that modern natural history deals only incidentally with the identity of plants and animals, and only incidentally with their habits and behaviors. It deals principally with their relations to each other, their relation to the soil and water in which they grow, and their relations to the human beings who sing about "my country" but see little or nothing of its inner workings. This new science of relationships is called ecology, but what we call it matters nothing. The question is, does the educated citizen know he is only a cog in an ecological mechanism? That if he will work with that mechanism his mental wealth and his material wealth can expand indefinitely. But that if he refuses to work with it, it will ultimately grind him to dust. If education does not teach us these things, then what is education for?

You here in Missouri are just reorganizing your conservation department. You are hearing about teaching conservation in the schools. The implication is that something is to be added to the curriculum. I submit conservation is no new excrescence on an already bulky curriculum. It seems to me that if all teaching does not deal with our relations to the land, it is not teaching at all.

Conservationists have, I fear, adopted the pedagogical method of the prophets: we mutter darkly about impending doom if people don't mend their ways. The doom is impending, all right; no one can be an ecologist, even an amateur one, without seeing it. But do people mend their ways for fear of calamity? I doubt it. They are more likely to do it out of pure curiosity and interest. We shall be ready, I think, to practice conservation when "farmer plants tamarack" is no longer news.