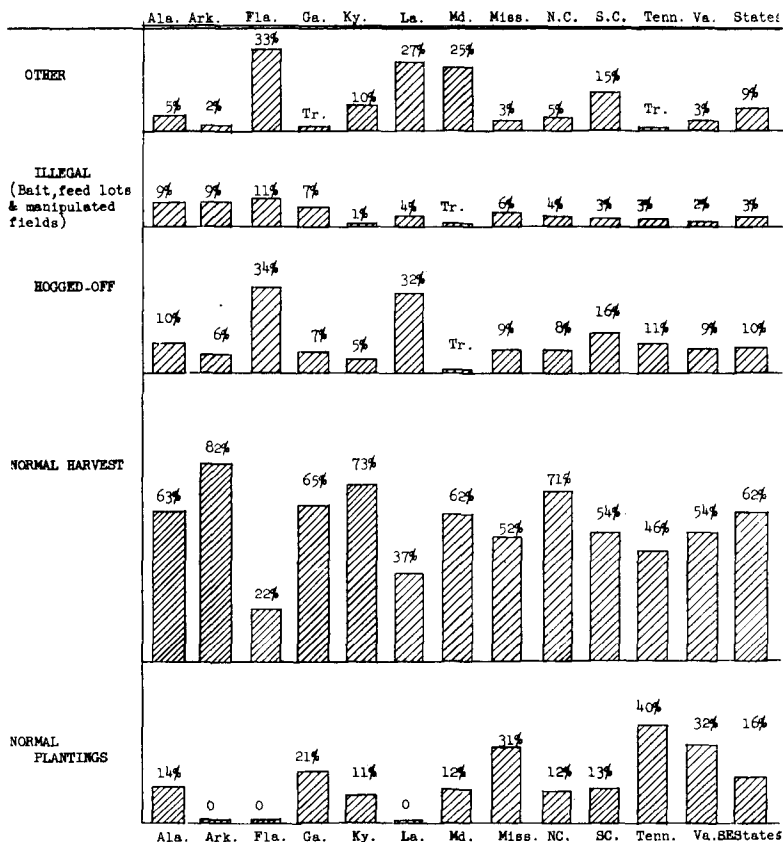


DOVE KILL DATA—1960
(September-November)
PER CENT OF TOTAL KILL EXAMINED IN EACH STATE
BY TYPES OF FIELDS OVER WHICH TAKEN



NOTE: Shoots in the "Other" category consisted mainly of Standing Crops, Water Holes, Pastures and Roosts. In Florida, citrus groves were reported for 10 shoots; Water Holes were prominent in Kentucky, South Carolina and North Carolina. Pastures came in for lots of attention in Maryland, Louisiana and Florida. Roost shooting made up over one-third of the "Other" category in Kentucky, while in Maryland "Gravel Pits" made up about one-fourth of that category.

THE FIRST GAME MANAGEMENT PROGRAM: THE DOMESTICATION OF ANIMALS

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The first game management program was at the same time a plant management program. Together they resulted in the domestication of plants and animals. As that happened long ago, upward of 10,000 years (1), you may be wondering what lessons it holds for you. I know of none. But you sometimes use domestic plants and animals in your

work. In fact, you wouldn't be in game management without them, as they are the foundation stones on which civilization rests (2).

Consider what man was before he had domestic plants and animals. He was essentially a wild animal and as much enslaved to his environment as were the bear and bison, the deer, quail and turkey. Like them he had to hunt for his food, had to go where it was or starve to death. That is an old story to you. You know how the food supply regulates the lives of wild animals. Ancient man was no exception. He couldn't increase his food supply by one mouthful, no more than the deer or turkey could. The result was that his numbers were relatively few before domestic plants and animals arrived, for man needs a big range if he lives off the country. It has been estimated that the entire human population of the world was probably no greater than that of present-day New York or London (3).

Domestic plants and animals freed man and made him master of his environment. Thereafter he could go where he willed as he could take his food supply with him, and he could establish villages that grew to towns and cities, for his food supply could be expanded to take care of expanded population.

Now what are these things that shaped and still shape man's destiny? They are commonly dismissed in history books as merely tamed versions of wild plants and animals. That isn't even a half-truth. They evolved from primitive wild forms but they were changed so greatly that in many cases today we cannot even trace out lineage (4). They are actually new forms, new species, and the proof that they were created by man is written in the fact they generally cannot survive and retain their distinctive characters if man's help is withdrawn (5). Plants and animals that need man's help to survive must have had it to come into being.

They are the most astounding creations that ever came from man's hands. Compared with an ear of corn the great pyramid is no more than a few rocks tossed up on a lazy afternoon, and even an atomic submarine is little more than a toy. One botanist, a specialist on corn, estimated that it would take upward of 20,000 years to create an ear of corn from any existing wild plant (6). Another hazarded the guess that 20,000 years was too short a time (7), a third went further, expressing the opinion our domestic plants may have had their beginning "far back into the Pleistocene (8)." So far as I know no one has guessed how long it would take to create all our kinds of horse, cow, pig, sheep, camel, cat, dog, pigeon and so on from any existing wild animals, but the time needed would be comparable to that for plants as the differences between our domestic animals and their nearest kin in the wild are so great their lineages are often hidden, just as with plants.

A major reason why few guesses are hazarded as to the time required to create our domestic plants and animals is that we have no yardstick, as not one domestic animal or major crop plant has been created in all historic time (9). I was unable to find any evidence whatever that a plant of any kind had been domesticated in historic time. Some of our old-fashioned garden flowers are dated as of this or that century when they first show up in the records. But that method is unsound. Our white potato got the name Irish because it first came to this country—New England in 1719—from Ireland. But it is more American than anyone but an Indian, as it was discovered in Peru and taken to Europe by the Spaniards. If that could happen to a food plant as valuable as the potato, many lesser plants could have wandered for thousands of years without leaving a track mark on the pages of history.

And that brings us to the question of how stone-age savages of upward of 10,000 years ago created plants and animals we have never duplicated. I say upward of 10,000 years. Let me explain that figure. Archeological work has unearthed plant and animal remains identified as domestic forms that are given radiocarbon dates of about 10,000 years ago. But how long did it take to create them? Maybe it didn't take 20,000 years, but maybe it took a lot longer. Whatever the time, we must add that to the known age of domestic plants and animals and explain their origin in terms of the culture at that distant day.

Now you may be thinking of the great improvements we have brought about in many domestic plants and animals, especially since the discovery of Mendel's paper in 1900 and the founding of the science of genetics.

But the late E. D. Merrill termed all our improvements "insignificant" beside the feats of stoneage man (10). They amount to no more than polishing.

Until Darwin spoke there was no mystery to the origin of domestic plants and animals. They were divine creations for man's benefit. The Egyptians credited the cereals to Isis, the Romans to Ceres, hence our word cereal, the Chinese to Heaven. The Maya not only gave the gods credit for corn but even had it giving birth to man. In the biblical story of creation the table is set when man arrives.

Darwin changed that. He saw the creation as part of evolution, but a part that depended on man, not on natural selection. He saw man as noticing the variations of plants and animals and preserving them by selection. "Nature gives successive variations," he said. "Man adds them up in certain directions useful to him (11)."

That is the present theory as to how our domestic plants and animals were created. The only embellishment scientists have added to it is to explain the motive force as necessity (12). Necessity drove ancient man to get more and better foods.

Let's test that theory. It embodies numerous assumptions which can be examined. For example, if we say that ancient man started planting for the same reason as a farmer today, we must assume he understood the biological role of seeds, knew that they give rise to plants. That is unsound. There were peoples of historic time who did not have such knowledge (13). Even Virgil, a good farmer as well as fine poet, thought that some plants spring from "the genius of the ground (14)." And Izaak Walton saw pickerel weed giving birth not only to pickerel weed but also pickerel (15). The evidence is overwhelming against crediting stoneage savages of upward of 10,000 years ago with understanding the reproductive role of seeds.

If we say he selectively bred animals we assume he understood the biological role of the male animal. There were peoples of recent historic times who did not have that understanding, even about themselves. They did not understand the relationship between sexual intercourse and reproduction (16).

And then there is the word selection itself. That's an assumption, a huge one. Through selection, the theory says, stoneage man added up the variations of his plants and animals in certain directions useful to him. Merely to state that assumption is sufficient to refute it, since we ourselves didn't have such skill and knowledge until yesterday and no savages ever discovered in historic time had any. Darwin knew he was on thin ice and even admitted that a "distinguished naturalist" declared such an assumption was "absurd (17)." But he went on and tried to prove that the principle of selection was within reach of the savage intellect. He failed, and no one since has tried to do better.

We must assume, too, that he kept his hands from his brood animals and seeds during famines, for all our domestic plants and animals are traced to centers, and if in the hundredth or thousandth year of domestication they had all been eaten ancient man would have had to start over as there was nowhere he could get a fresh supply except in the wild. No primitive peoples of historic time showed such control over their appetite.

If we say ancient man started the selective raising of plants and animals because necessity was driving him, we assume that all of them gave him an early and practical return. But some wild animals don't breed freely in confinement (18). And not all the plants he raised were edible at the beginning. Dr. Merrill told me that some of our prized food plants are traced to wild plants that are dangerously poisonous (19), and what necessity could drive a man to create ornamental plants (20), or tobacco and the opium poppy? But let's consider only the grasses, all of which have edible seeds, the progenitors of our cereals. If you were stranded in a sea of grass and necessity was driving you to get bigger and better seed than you could gather in the wild, would you start a grass garden? We will assume you did. At your death the seed in your garden would still be exactly the same as that of the wild grass, for one human lifetime is like a watch in the night in changing grass seed to wheat, corn or some other cereal. I'll let you guess for yourself how many generations past your time it would be before your descendants had something better to eat. Certainly for centuries if not milleniums

their efforts to get something better to eat would have been love's labor lost. If necessity had been the force driving you to start a grass garden you and your family would have starved to death before the fence around your patch was well weathered.

No one holds Darwin in higher regard than I. He was a giant. But his theory of how ancient man created domestic plants and animals will not bear examination. Until now it has never been examined.

Now what is the alternative? There is only one. It is that stoneage man started raising plants and animals for an irrational reason, not a practical one. He held them sacred. He wasn't planting a seed, he was burying a god, returning it to Mother Earth. And he wasn't raising animals. He was sheltering gods, keeping them near him. Every kinship group or clan had its own plant or animal, which was taboo for common use. Both male and female animals were kept, not because the people understood reproduction but because a male and a female constituted their own unit of society. There was no attempt to improve the plants and animals. They were gods and gods are always perfect. There was selection, but it operated this way: seeds that appeared to the people to be perfect replicas of their god were returned to Mother Earth, and the animal offspring that seemed replicas were raised. All other seeds and animals were destroyed. That was interference with the natural course of evolution and it directed evolution in unnatural ways. Eventually it resulted in the creation of new forms, domestic plants and animals, but the change was so slow that no man was aware of it.

When plant and animal worship ended, agriculture was born, but the birth was painful and slow. For a long age all peoples continued to cling to ritual practices and food taboos observed when the plants and animals were gods (21)—and some peoples continue to cling to them even to this day.

I might add here that the irrational theory of domestication is not original in any sense with me. The key to it was provided in the latter part of the last century by the brilliant Scottish anthropologist and Semitist William Robertson Smith (22)—who, oddly enough, from our point of view today, was also an ordained minister. But he was never popular with cultural anthropologists. In fact, one must hunt hard in the anthropologic literature of this country to find even a mention of him. There are fashions in science as in clothes, as some of you may have discovered.

In closing I admit again I cannot point out to you any lesson you can learn from the first game management program. I can only point out your enormous debt to it. The next time you use domestic plants or animals in your work pay ancient man the tribute of a moment of wonder, for his bequests to us are incomparably the most astounding creations that ever came from man's hand.

REFERENCES

1. Data are scattered. Two recent papers that contain dates are Charles A. Reed, *Animal domestications in the prehistoric Near East*, Science, Dec. 11, 1959, Vol. 130, #3389; and Robert J. Braidwood, *Near Eastern prehistory*, Science, June 20, 1958, Vol. 127, #3312.
2. William H. Howells, *Mankind so far*, Doubleday, 1944, p226.
3. Clark Wissler, *Wheat and civilization*, Natural History Magazine, Nov., 1943, Vol. 52:180; and Howells as in Note #2 above, p295.
4. Material on animal lineage is scattered and must be sought out under the heading of each animal. An excellent study on the lineage of domestic plants is Oakes Ames, *Economic annuals and human cultures*, Bot. Mus. booklet, Harvard Univ., 1939.
5. Th. Dobzhansky, *Genetics and the origin of species*, Columbia Univ. Press, 2nd ed. rev., 1941, p62. E. D. Merrill, personal correspondence July 29, 1947. He made a similar statement in *Observations on cultivated plants*, Ceiba, Tegucigalpa, Honduras, Vol. 1, Jan., 1950.
6. G. N. Collins, Bull. Torrey Bot. Club, Vol. 57, No. 4, 1930, p207.
7. J. H. Kempton, Smithsonian Sci. Ser., No. 11, 1931, p325.
8. Ames as in Note #4 above.
9. Many scientists have noted the fact. The first one to observe it

- regarding animals was John Crawford, *On the relation of domesticated animals to civilization*, Trans. Ethno. Soc. of London, 1863, Vol. 2, n. s. The first on plants was A. de Candolle, *Origin of cultivated plants*, Appleton, 1885, p4.
10. E. D. Merrill, *The phyto-geography of cultivated plants*, American Anthropologist, 1931, Vol. 33:379.
 11. Charles Darwin, *Origin of species*, 1st ed., p34; 6th ed., Part 1, p58.
 12. P. C. Mangelsdorf and R. G. Reeves, *The origin of Indian corn and its relatives*, Texas Ag. Exp. Sta. Bull., 1939, #574, p292.
 13. J. G. Frazer, *Totemism and exogamy*, 1910, Vol. 4:19.
 14. Virgil, *Georgics*, Dryden trans., book 2.
 15. Walton and Cotton, *Complete Angler*, Caldwell, Boston, no date, about 1900, p144.
 16. Baldwin Spencer and F. J. Gillen, *The Arunta*, 1927, Vol. 1:272. B. Spencer, *Native tribes etc.*, 1914, p25 and elsewhere. B. Malinowski, *The father in primitive psychology*, London, 1927; *Sexual life of savages*, London, 1929, and *Baloma*, Jor. of the Royal Anthro. Inst., Vol. 46, July-Dec., 1916, p417. Tracy I. Storer, *General Zoology*, McGraw-Hill, 1943, p136, says "the causal relation of copulation to birth of young is still unknown to some primitive peoples."
 17. Darwin, *Variation of animals and plants under domestication*, 2nd ed., rev., N. Y. Appleton, 1894, Vol. 2:185.
 18. Berthold Laufer, *Methods in the study of domestications*, Scientific Monthly, Sept. 1927.
 19. E. D. Merrill, personal correspondence Mar. 31, 1950.
 20. Edgar Anderson, *Plants, man and life*, Little, Brown, 1952, p119, says "some of our ornamental plants may have as ancient a history of domestication as any major crop plant."
 21. R. H. Kennett, *Israel*, Hastings Ency. of Religion and Ethics, says "in primitive times agriculture was bound up with religion, so that agricultural operations might almost be reckoned as ritual observances."
 22. W. R. Smith, *Lectures on the religion of the Semites*, Appleton, 1889.

A SUMMARY OF AGRICULTURAL CONSERVATION PROGRAM PRACTICES IN KENTUCKY AS THEY AFFECT LAND USE RELATING TO WILDLIFE ¹

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INTRODUCTION

"The Agricultural Conservation Program (herein referred to as the ACP) shares with individual farmers and ranchers the cost of carrying out soil and water conservation measures intended to (1) protect farm and ranch land from wind and water erosion, (2) improve the productivity of the Nation's agricultural resources, and (3) protect and improve the source, flow and use of water for agricultural purposes." (USDA, Dec., 1960). According to United States Department of Agriculture figures (March, 1960), during the years 1950-1959, the ACP in Kentucky has had gross annual expenditures ranging from \$5,000,000 to \$7,794,500. The total number of farms in the state declined by 18,558 during this same period. (USDA, March, 1960). This same reference indicates that farm participation in the program also declined from 66% of the total farms to a 1959 low of 19%. Yet, the total allocation of ACP funds has not proportionately decreased, but averages around \$7,200,000 annually.

The decreased farm participation with little or no decrease in ACP expenditures is accountable by the jump in average payments to parti-

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