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"The Invaders" sounds like a science-fiction T.V. movie, but in "real life" the Invaders into Kansas have, in some cases, been more ominous than any T.V. drama, and all of these Invaders have affected our lives to some degree. In fact, it is our invasion into this geographic area that has caused us to be here and continue to be here. And, this, to the detriment of previous occupants of the space, for the most part.

First, however, let's look at what we are considering. There are several ecological principles that help explain the changes that have occurred over periods of time.

One is succession. A plowed field, for example, if left untouched, will go through a predicted series of vegetational changes over a period of years until reaching a certain combination of plants that remains unchanged for an extended period of time. This is termed the climax stage. Over centuries, with changes in geology and climate, resulting changes take place in plant communities which cause corresponding changes in the animals that depend upon that particular community. They can either stay and adapt to the changes, move away, or perish.

Also, a term, carrying capacity, indicates that a given area can support only so many of a given species—plants or animals. Thus, if the carrying capacity is exceeded, a resultant correction in numbers of the species exceeding this capacity must be made—by the excess "spreading out (becoming emigrants)" or by remaining and causing extreme stress on all members of the species.

Each species has its own unique requirements: for light, water, air, space, food, and other necessities. Where each species ordinarily resides it is kept in check by limiting factors. These may be the availability of necessary resources, such as food, water, nesting sites, and the like; or by predation, disease, or climatic conditions. When a species is removed from its home ground and placed into an area where the requirements are met but the limiting factors are removed, the species will often "explode" with unlimited reproduction and exploration of all available habitat.

"Invaders" may occur because of any one or more of the following: they can be introduced on purpose, they can be extending their range because of changed climatic conditions or by internal

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population pressures, or have come along as unintentional “passengers” on animals, plants, or human vehicles.

Invaders can be desirable members of the new community or highly detrimental to it. In each circumstance, the least disturbance a new species will make is to cause a series of adjustments among other members of the community, for each community has become a well-ordered system of checks and balances over time.

Sometimes an invading species can cause irreversible changes which essentially eliminate one or more native species, or bring economic disaster or discomfort to large areas, even whole continents. For example, the introduction of a plant disease, Asiatic Chestnut Blight, inadvertently brought in on nursery plants near the beginning of the century, almost completely wiped out the magnificent eastern forest of American Chestnut. The House Sparrow, a native European bird, was intentionally released in several parks on the east coast during the middle part of the last century. Now try to find an urban spot from coast to coast that is without this aggressive bird. So many various kinds of introductions have been made into New Zealand and Hawaii that it has been said it is difficult to find a native species. The well-intentioned introduction of the European Rabbit into Australia is now a calamity as humans fight for control over this prolific pest. And the spread by sailing ships of the Norway Rat and House Mouse from Europe over the rest of the world, even remote islands, has caused untold misery and economic loss.

“Good” introductions, such as exotic game birds and large mammals, have increased possibilities for sport hunting and esthetic appreciation without apparent harm to native fauna. But the “baddies” outnumber the “goodies,” and federal and state governments are alert to spot and monitor any new visitor. Import laws are being enforced which are designed to eliminate entrance of undesirable species that might stand any chance of unintentional spread. Animals are quarantined and plants rigorously inspected to see that no parasites or diseases are allowed in. Some states have inspection stations at their borders to attempt to prevent the spread of fruit diseases and certain insect pests. That these measures do not completely stem the influx is attested to by the news of some of the outbreaks that were not foreseen. And some persons aid these aliens by sneaking in foreign plants or fruit, or by collecting wild animals (usually unlawfully), bringing them home as pets, and later releasing them when care becomes a burden.

The remainder of this booklet will address Kansas specifically: historically and by categories. These examples hardly scratch the surface, but will give an idea of the origin of some familiar and some not-so-familiar Kansas plants and animals.

HISTORY

Kansas has not always been a grassy range “...where the deer and the antelope play.” And not only were discouraging words not heard, but no other words, either, until the human Invaders arrived ... yesterday, in
Historically, the region that is now Kansas has experienced series after series of invasions as successions of strange populations exploited the swamps, seas, forests, frigid wastes, and, finally, grasslands over eons of time, accommodating to extensive changes in geology and climate.

Some 250-350 million years ago, toward the latter part of the Paleozoic Era, during Periods known as the Mississippian and Pennsylvanian, parts of Kansas were covered by a mild sea, teeming with fish and invertebrates, such as the flower-like Crinoids, shelled Brachiopods, coiled Cephalopods, and the now-extinct Trilobites. The land masses were low, hot, humid swamps, in which dwelt an abundance of insects and strange amphibians among equally strange plant forms: giant Horsetails, hundred-foot Scale Trees, Seed Ferns, and Sigillaria, tall trees with peculiar, strap-like leaves.

As century after century passed, changes occurred in both the flora and the fauna. Reptiles replaced the amphibians as the dominant land forms and produced multi-ton monsters, the Dinosaurs. The Kansas swamp had become the bottom of a sea, in which swam, along with the fishes, huge reptiles, whose remains today are found imbedded in the chalk of western Kansas. The chalk itself represents the skeletal remains of billions of tiny marine creatures that flourished in the sea. Also present at this time were flying reptiles, the Pterosaurs, and toothed birds. These forms existed in the Cretaceous Period, the last of the three periods that constitute the Mesozoic Era, a 125 million year span generally referred to as the Age of Reptiles. Elsewhere, during this time, major changes had taken place in the form of the land and the climate. North America was moving toward its present location and it was drier and cooler. Flora had changed significantly, too. Gone were the swamp trees, being replaced by conifers and later by a multitude of flowering trees and smaller plants, as the Angiosperms arrived, destined to become the dominant plant form on earth.

The rise of the Rocky Mountains signalled the end of the reign of reptiles. Gone forever were the Dinosaurs and their flying and swimming kin, along with a host of other forms, such as the cephalopod Ammonites. As we entered the Cenozoic Era, the birds and mammals (small, insignificant forms during the Mesozoic) began to proliferate. They grew in size and number of species, testing and filling the niches available to these warm-blooded types. Periodic droughts alternated with better times, inducing changes in both flora and fauna. But there were no prairies as we know them today. This was all changed when, later in the Cenozoic, grass evolved, filling forest openings and regions where precipitation was too sparse to support major tree growth. These grassy areas created a habitat for opportunistic Invaders and a host of mammals responded. Browsers became
grazers and were followed into the grasslands by predators and scavengers. Continued changes in climate caused corresponding changes in the extent and type of plants and animals. Long-term fluctuations from warm and humid to cold and dry and back produced, in turn, conditions from tropical to arctic. The culmination of these fluctuations began some two and a half million years ago when we entered the Pleistocene Epoch, a period of time that brings us almost to today, and during which four huge, global glaciers moved down from the Arctic and back, the first two reaching into northeastern Kansas; the last of the four being about 18,000 years ago. Extreme cold periods when the glaciers were at their maxima caused plants and animals to move southward or perish; few were able to adapt. Then, when the glaciers retreated northward and the climate moderated, a reinvasion of the biota occurred, often composed of forms different than before. We are now in the last stages of the northward movement of the fourth glacier, whose advance and retreat formed our river systems, the Great Lakes, and much of the topography north of us, setting the stage for our most recent Invaders. During the Cenozoic, Kansas saw as part of its fauna elephants, rhinos, camels, sloths, and other creatures that we generally associate with other continents.

Humans came in to North America during the Pleistocene from Asia, becoming the Indians of today. Kansas was invaded by these Indians following the retreat of the last glacier as they followed the large game mammals northward. Then came the greatest invader of all -- the White Man, who brought to Kansas with him not only horses, but also syphilis and tuberculosis as invading pathogens. Once in command, the White Man introduced an unassessed number of alien species into Kansas: bacterial, viral, molds and fungi, ornamental and cultivated green plants, dogs, cats, livestock, along with all of their parasites and disease organisms.

So here we are, an Invader among Invaders, rightly or wrongly affecting the welfare of the previous Invaders, whom we term "native."

**BACTERIA/VIRUSES/FUNGI**

There is a wholesale invasion into Kansas today of bacterial and viral pathogens, and a major struggle is under way to control, if not eliminate, these forms. Whooping cough, measles, diphtheria, colds, flu, and many other common diseases are so widespread and usual that we do not think of these as Invaders, but they certainly have been brought in at one time or another along with our "civilization." More rarely do exotic pathogens, such as malaria, tularemia, or spotted fever occur, but occasionally they do invade our area. The Plague, which devistated the world in the Middle Ages, is hardly spoken of today, but pockets of Plague organisms.
reside in certain populations of small mammals, with the potential for human invasion. Invasion forces of foreign livestock pathogens await the lowering of inspection safeguards, and once in awhile slip through, creating considerable concern and economic loss.

A fungus, carried by a beetle, has changed the appearance of small town streets, parks, and college campuses in the eastern half of the United States, including Kansas, in the recent past, and is still at work. Known as Dutch Elm Disease, it entered the U.S. from Europe early in the century. Bark Beetles, which burrow under the bark of certain trees, carry with them a fungus, Ceratostomella ulmi inoculating it into the tissues of the American Elm, for which the fungus is specific. Quickly the disease spread from New England to Ohio; then south and west. In areas of contamination, few trees can be saved. Whole streets, once canopied with arcing green, became entirely devoid of living elm trees. Planted for their beautiful growth form, American Elm was a favorite for parks, parkings, and college campuses and made up the majority of tree species in these places. Like a forest fire, the rapid wave of Dutch Elm Disease infection raced across these scenic spots, leaving only dead and dying skeletons; no longer furnishing shade and beauty. The disease reached Kansas in the 1950's, and in a few short years had reached the center of the state, leaving behind a pitiful sight. All sorts of home remedies were tried to halt the invasion -- some quite hilarious -- but this was a cruel Invader with no compassion, and few trees were spared.

PLANTS

We have seen that great changes have taken place in the flora and fauna of Kansas over geologic time, culminating in the region becoming primarily a grassland. When the White Man first arrived in Kansas, he discovered a vast sea of grasses, with a deciduous forest along the eastern edge and extending westward along the rivers. Soon after settlers arrived, this situation began to change. Ground was broken for farm crops and trees were planted around homesteads and along town and city streets. Native grasses gave way to the Invaders: wheat, corn, sorghum, and garden crops. Later, eastern and foreign grasses were brought in and planted as lawns and in public places. Cattle and sheep replaced the Bison as the most important foragers of the native grasses: Bluestems and Indian Grass in the east and Buffalo and Grama Grasses in the west.

Ornamental deciduous trees were brought from the East and the South and evergreens from the North and West. The Northeast provided Sugar Maples and nut trees came from various parts of the East. Groves of Walnuts and Pecans appeared; fruit orchards sprang up, ranging from small farm projects to large commercial ventures: apples, peaches, pears, and apricots were particularly favored. Windbreaks, composed of several rows of trees of specific types were planted with the rows usually in an east-west direction on the north side of the area to be protected. The idea was to block off some of the terrible winter wind and snow, and secondarily as a
benefit for wildlife --- and they worked! That is, those that survived did work. Usually, Red Cedar and Russian Olive were important components of successful windbreaks. But many tree varieties were tried and many were just not suited for the Kansas soil and climate. The biggest boost to windbreaks came in the 1930's when Civilian Conservation Corps (CCC) units were sent around the state to plant windbreaks where requested, and, in many cases, for no apparent good reason at all. This group also experimented with all sorts of combinations of trees, resulting in many failures. The majority of windbreaks were planted in the central and western parts of the state, and the successes and what remains of the failures are still visible. Windbreaks did contribute to the Kansas plant invasion into the grassland.

Another invading species is the Osage Orange tree, generally known as Hedge, whose native distribution is southeastern Oklahoma, Arkansas, Louisiana, and Texas. It has been widely planted in the eastern United States and was brought to Kansas and planted as fencing. The tree is hardy in the eastern part of Kansas, but not very successful in the western part of the state. It was found that the thorny, dense branches held in livestock very well, and, if cut off, produced a thick network of new branches that needed no care. The cut trunks were found to make good bows, as well as excellent fence posts for wire fencing and for wagon tongues, as the wood ages to a consistency of iron. As an added bonus, Osage Orange burns with a hot flame, making it desireable for home heating, except for a proclivity to pop and spit.

An interesting story involves the invasion into Kansas of a wild plant, a cultivated plant, and a beetle. This black and yellow striped beetle, about the size of your thumb nail, once occupied a natural range along the foothills of the Rocky Mountains in New Mexico and lower Colorado. Its range coincided with that of a native spiny plant with yellow blossoms, the Buffalo Bur, Solanum rostratum. When the wagons of the early Pioneers crossed Kansas and the supply wagons lumbered back and forth from Kansas City to Santa Fe, Solanum plants hitchhiked on wheels and axels, dropping off all along the way. At this time the little plant became known as the “Santa Fe Trail Bur.” Not surprisingly, the beetle followed its food source into Kansas, increasing its range along with the plant. Along the way, somewhere in Kansas, these two adventurers came upon a farm where there grew some strange plants from the East. These plants were the Irish Potato, which also is a member of the Solanum genus; close kin, indeed. The beetle sampled the stranger-plant, found it tasty, and, in typical beetle fickleness, changed partners. Although we still find some of these beetles feeding on the original Solanum, the majority have marched, generation upon generation, to the East Coast on Irish Potato plants and have crossed the ocean to Europe. These beetles are now familiarly known as the Colorado Potato Beetle. So, if it had not been for the wagons of the Pioneers, the original star-crossed pair would still be blissfully
enjoying each other's company in the Rocky Mountain foothills. And Kansas might be without two undesirable invaders.

Human pollution of lakes, streams, and ponds has caused an increase in, plus introduction of, filamentous algae, much of which we could do without. It causes odors and tastes in drinking water and well as unsightly mats where it occurs. Whereas some of these algae are desirable, most are Invaders taking advantage of a situation.

INVERTEBRATES

When apples were brought to Kansas, they were attended by a tiny, nondescript, gray and brown moth, the "Codling Moth," which had caused serious problems in the orchards of the Northeast. Control measures have been taken, but when you discover a "worm" in your Kansas apple, you can usually blame this unwanted Invader.

Probably the most disgusting of the invading insects are the roaches. Three types of these domestic pests infest us: the blackish Oriental, the larger, browner American, and the lighter, striped German. Roaches have changed little since long before dinosaurs came on earth, which is evidence of their design for survival. And their adaptability and secretive ness, along with a high reproductive potential, make roaches excellent Invaders.

Kansas has a large variety of spiders. Most of these are probably "native," but one highly unpleasant member of this arachnid group has invaded the state during the past several decades. It is called Brown Spider, Recluse Spider, or Violin Spider; each of the names referring to color, behavior, and pattern. Scientifically known as *Loxosceles reclusa*, it moved northward from Texas, through Oklahoma, and into Kansas, where it has spread over the state. It is a small, brown, relatively unhairy spider, with a dark brown "fiddle"-shaped mark on the upper surface of the cephalothorax. Typically, they associate with humans, in the home, sheds, schools, or business buildings; staying mostly out of sight, hiding in cardboard boxes, under furniture, or other darkened, cover spots. We generally discover the Brown Recluse when one gets trapped in a sink or a bathtub. The reclusive behavior, which gives the species its name, unfortunately accounts for the spider seeking shelter in clothing. Most bites occur when the spider is pressed against a person's flesh during dressing. The bite can be painful at the minimum and even deadly --several persons have died as a result of the bite of this spider. The poison causes a large swelling at the site of the bite, which becomes black, with the flesh deteriorating and becoming an oozing sore. A deep, lasting scar, about the size of a quarter, may ultimately result. Different persons respond differently to the effects of the venom, but a physician should always be consulted as soon as possible.
Potential invertebrate Invaders lurk around us, perhaps waiting for the right conditions. To the east, there is the Japanese Beetle, a terrible garden pest that is almost impossible to control. It is the size of the Kansas May Beetle or June "Bug," with a series of black and white spots on the sides. There have been "plagues" of these beetles that are something to behold. Let's hope that they stay away! The Argentine Ant and the Fire Ant are southern pests that we also hope stay somewhere else. The former destroys other ant species and the latter, among other atrocities, destroys Bobwhite Quail by entering the freshly-pipped eggs and feeding on the young birds.

**FISH**

The Carp, originally from the Orient, has been raised for food in Europe for centuries. Europeans, immigrating to the Midwest, felt that it would be in their interest to have this popular item on their tables, so in the mid-part of the last century introductions were made. The Carp immediately began to spread out, and, in almost no time, it was known well outside of the original release sites. In 1880, the Carp was introduced in Kansas and, today, you can almost have a fight on your hands if you say to certain fishermen that this was a good thing. For, although it is a fine food fish (not everyone agrees with this) and a tenacious fighter on tackle, it does crowd out and destroy the nesting sites of more "desirable" species. It certainly occurs all over the state now --- and it's here to stay.

An entirely different kind of fish was introduced into Kansas waters in the early 1940's. It is the Mosquitofish, *Gambusia*, a tiny live-bearer from more southern regions that feeds in large part on mosquito larvae and pupae when available. It is for this mosquito control that it was introduced. Since it is susceptible to extreme cold, the species is limited to the southern half of the state, and populations may fluctuate or disappear in any given area depending on the harshness of a particular winter. The Mosquitofish can be highly prolific under good conditions, and it is beneficial when it can become established. At last we have a good Invader!

Various other types of fish from outside of our state have been introduced with varying results: trout, red-ear sunfish, pike. Among the accidental introductions has been the Goldfish. Used extensively as a bait fish, escaped and released Goldfish have bred successfully in some places and have produced individuals that have outgrown by several times their aquarium relatives. It is not probable that we will witness an invasion on the scale of the Carp's, but the Goldfish may eventually become a "native" species.

**REPTILES**

Kansas has a splendid reptile fauna. Snakes, lizards, and turtles are found in good numbers throughout the state. Since most of them stay out of the way of people and are secretive by nature, they are noted only when something unusual occurs that attracts attention, such as newspaper stories of exotic Boas, Pythons, or Cobras escaping captivity.
There would be concern only in the locality of the latter, for none of these could start a colony or survive a Kansas winter in the open. In most cases, they are killed or recaptured in short order, so we are not about to have these exotics added to our Invader list.

However, we have had several minor invasions of reptiles in recent memory. The American Anole, a small green or brown lizard, often sold for pets at circuses or pet stores, is a native of the southern United States, getting as close to Kansas as southeastern Oklahoma. Anoles were accidentally or intentionally set free in the Atchison and Olathe areas; also in a spot in Kansas City, Kansas. These Anole populations were viable for a time, but the fate of these Invaders is not known. Most likely they are no longer there.

A more tenacious lizard population has been attempting to hang on in Topeka. Made up of two lizard species from Europe, they have had their ups and downs for some 30 years. In the 1950's, Dr. Charles Burt ran the Quivira Specialties Company in Topeka. Part of his business was the importation and sale of reptiles of all sorts. Among those that he received regularly were two kinds of lizards that lived in Europe in a climate quite similar to ours, and in urban settings. Enough escapees of the two species made it away from Dr. Burt's property to set up housekeeping in the vicinity. In due time, they had found suitable habitat in and around foundations of deserted and run-down dwellings and in the "wilds" of backyard plants and junk. One species, the Green Lizard, has been only moderately successful and is rare. The other, the Ruins Lizard, a spotted and striped green lizard, smaller than the Green Lizard, has, so far, been able to maintain itself over a fair area from the escape site, and has had to overcome such traumas as having a shopping center built on its habitat and other clearing and cementing projects. Since it is an urban lizard in Europe, it will probably adapt appropriately in Topeka.

Since not many persons keep poisonous snakes as pets, their occasional escape should not cause an invasion, only short-term anxiety. Turtles, however, may be something else. At one time, baby turtles were always available for sale at dime stores and pet shops. Quite often these baby turtle pets were released into local streams and lakes when the owners found that the pet had worn out its welcome because the owner couldn't, or didn't want to, take care of it. Rather than let it die at home, the turtle was released into the wild. These turtles for the most part represented species or subspecies that did not occur in Kansas. It is not known if any of the releases had any effect on the local turtle gene pool, but the potential was there. Federal law now has made traffic in baby turtles illegal, so that takes care of that.

More to the point, Box Turtles are spread around the state by well-meaning persons who pick them up on roads in Texas, Louisiana, Oklahoma, Arkansas, or Missouri. Kansas has two kinds of Box Turtles as natives: the Ornate, which occurs in most all of Kansas, and the Three-toed (Carolina), which is found in the southeastern
quarter of the state. It is not uncommon to have a report of the capture of a Three-toed Box Turtle in a city situation well outside of the normal range. This has not caused an invasion and the consequencies are slight, but picking up and transporting -- then releasing --turtles and other animals outside of their natural range is to be frowned upon. You do not do the animal a favor by releasing it in a region to which it is not adapted. And, besides, in many states there is a law prohibiting the capture and possession of wild animals.

Kansas, apparently, has had no recent invasion of reptile species, so our state is as it has been for sometime, regardless of releases of "pets."

**BIRDS**

Of all the recent vertebrate Invaders, the birds have, by far, outstripped the others. Not only have we witnessed spectacular exterminations among our avian species, but also there have been even more spectacular invasions.

Among the best known of the inadvertent new populations in Kansas are the "Big Three" that were released on the East Coast by well-intentioned persons and spread westward.

The House (English) Sparrow was introduced into this country in Brooklyn, N.Y. in 1850; later in other parts of the United States. It appeared in Kansas in about 1886. An urban bird, it proliferated in the "horse days," feeding on grain around stables and in horse droppings. The replacement of the horse by the automobile has caused some adjustments to be made in the bird's behavior. But look outside -- the little brown buggers are all around us!

Pigeons have seemed to have been a part of the American scene for always, and, in reality, they have. Domesticated some 5000 years ago, they were brought to this country by the early settlers. They revert to the old Rock Dove habits and habitats when they "go wild." Originally, these birds nested on the cliffs of southern Europe; now these sites are the "cliffs" of bridge superstructure, barns, and window sills of tall buildings. Populations of Pigeons are localized today. Where once they were seen almost everywhere, now they are concentrated around feed lots, parks, grain elevators, and farms that tolerate them. Some groups may be found in the vicinity of railroad yards, where lofty, open buildings provide roosting and nesting sites.

Last of the "Big Three" is the European Starling. Once it had a natural range of Europe and part of Asia. Not content to let things ride, the Starling was introduced into the United States in 1890. Someone should have known better, for 20 years before, it was introduced into New Zealand, where it was termed a disaster, farmers claiming that the bird had brought ruin to them by decimating their crops. Nevertheless, we got the Starling and do we have it!
More aggressive and larger than the House Sparrow, this bird, with astounding reproductive capacity, marched relentlessly to the West. It first appeared in Kansas in the mid-1930's. Once stopped for awhile by the Rocky Mountains, it has breeched this barrier and now is established from coast to coast. Although Starlings are most often found in the vicinity of cities, they are also foragers in the fields of farmers nearby. Their proclivity to congregate in huge flocks, makes them a formidable scourge on a grain field -- or a bird feeder. Starlings are cavity nesters, taking over houses set up for Purple Martins, holes and cavities in trees, and utilizing holes and cracks that allow space under house roofs. Extremely aggressive, Starlings chase away and occupy Woodpecker nest holes or those used by Bluebirds and other native species. The flocking behavior produces large numbers of birds that litter sidewalks under roosts and are otherwise objectionable because of their calls and raids on feeding stations of bird fanciers.

Apparently, the "Big Three" are here to stay, and represent another example of good intentions going awry because of ecological ignorance or disregard.

The other side of the coin are those birds that have been brought into the state from elsewhere and released intentionally. These include those species that were intended to increase the type and numbers of birds available for hunting -- such as the Ring-necked Pheasant and Chukar.

Pheasants were first introduced into Kansas by the Kansas Fish and Game Commission several decades ago. Western Kansas seemed to meet the requirements of these large birds and they flourished. Movements eastward in recent years have brought the Pheasant as far as the Flint Hills in considerable numbers.

Chukar are Oriental birds that are somewhat similar to a large Bobwhite. Experimental introductions into Kansas in the past 20 years have met with mixed success. The test of time will tell if these introductions have been worth while.

Escaped cage birds are not usually a problem, for there are not others of their kind with which to mate and establish a viable population. In addition, outdoor conditions, weather and predators, make survival unlikely for long. In some places, however, such as Florida, escaped pet birds have become a problem, with a dozen or so species now nesting and producing young. One particular Invader, an aggressive species, is the Monk Parakeet. This is a medium-size Parrot, with red and green color pattern, that has spread up the east coast to New York and inland -- at least to Kansas. Reports of this bird are becoming more frequent. It is a destructive bird to other bird populations and can become a real nuisance to fruit orchards. Since control in other states has not been rewarding, Kansas may, soon, have another obnoxious pest added to our list of common birds.

Other birds that have invaded Kansas in recent years by increasing their ranges include the Scissor-tailed Flycatcher, Great-tailed Grackle, and Cattle Egret.
The Scissor-tail, one of most beautiful and economically desirable birds, moved up from Oklahoma about 40 years ago. Quickly spreading northward, it now is a common nesting bird, more abundant in the eastern part of the state.

Great-tailed Grackles, large iridescent black birds with huge tails and peculiar cackling and whistling calls, moved up from Texas about 25 to 30 years ago Oklahoma and established breeding sites near Cheyenne Bottoms and close to Wichita. They have spread to the eastward at least to Lyon County, where they appeared in numbers two years ago. Certainly, they will be part of the permanent avifauna of Kansas -- and one of the most obvious species.

Cattle Egrets ought not to be here. We know them from photos and movies of Africa, where they are standing on a Rhino's back or around a herd of Zebra or Wildebeests. That's where they ought to be. But, sometime ago, they began a long trek across the Atlantic to Brazil, followed by expansion through South America, and hopping across the West Indies, the birds established footholds in Texas and Florida. About 25 years ago, it was a bird watcher's delight to be able to see a Cattle Egret; then, suddenly, here they were -- in quantity -- over southern Texas and peninsular Florida. And they moved north, expanding the range also along the Gulf coast to the west. Since arriving in Kansas about 20 years ago, they have become rather common in the southeastern half of the state, with stragglers elsewhere. Breeding colonies have been established near Cheyenne Bottoms and close to Wichita. We will have to see if this invasion will be beneficial; it should be, for the Egrets feed on insects, generally those disturbed by cattle. If they displace some of the Cowbird population, I will not shed a tear. At any rate, Cattle Egrets are part of the Kansas heron array; and they are here to stay.

We witness seasonal Invaders, too, as migratory flocks of many species pass through on their way to wintering or nesting grounds. In addition, we have regular seasonal residents that are here either in summer or winter, and are not here during the other season. In this category are those, in part, of the Thrushes, Wrens, Flycatchers, Vireos, Swallows, and Blackbirds in the summer; and Harris and Tree Sparrows, Longspurs, Juncos, and an occasional Snowy Owl in winter. For the most part, these are the Invaders that we do not mind, for the ebb and flow of seasonal bird types stimulates the Spirit.

Reinvasion of Kansas by species that were exterminated or in danger of being eliminated is being attempted by the
release of certain birds by the Kansas Fish and Game Commission. It is uncertain at this time if any of these will prove successful. So far, foster parent programs have been tried by putting eggs or young birds in the nests of established close relatives. Among those bird species that have been tried are the Peregrine Falcon, Swallow-tail Kite, and Mountain Plover. We are hopeful that these introductions will work.

MAMMALS

Reports of mammalian invasions frequently occur as news items if sensational enough, such as Black Bears in Baldwin City, Mountain Lions almost anywhere at one time or another, or "Bigfoot" near Emporia. There have been invasions, however, that are just as sensational (but not newsworthy) that have dramatically affected the lives of other inhabitants of Kansas. Perhaps the most profound of these was the replacement of the Bison by cattle as civilization moved into the prairie.

Fortunately, most of the mammalian pets, such as dogs and cats, that accompanied Man on his invasion, remained closely associated with him. Feral cats, and occasionally dogs, do pose somewhat of a problem, but there appears to be no big breeding population of of these pets "gone wild."

Also, those great domestic pests, Norway Rat and House Mouse, that Man has inadvertently planted around the world, generally stay around human habitations, affecting these areas rather than wild populations. They are successful Invaders, nonetheless.

One mammalian species that seems to want to invade is the Armadillo. It is found sporatically here and there in the state. Usually, these "finds" are attributed to some individual Armadillo with an extreme wandering proclivity or to accidental transfer by inadvertent "hitching." The Armadillo occurs naturally, and in quite a few numbers, in the southern half of Oklahoma; less frequently in the northern half. We may be witnessing the northward extension of a range that got its start thousands of years ago when North and South America became connected in Panama. All of the relatives of the Armadillo stayed in South America: Sloths, Anteaters, and other Armadillo species. But this one kind crossed the isthmus and moved slowly northward through Central America and Mexico, eventually spreading along the Gulf coast from Texas and northward into Oklahoma. It may well be that the winters in northern Oklahoma and in Kansas are too severe for this scaly fellow, but don't count him out as an Invader. He hasn't done badly so far!

Restocking programs have introduced species which are hoped will start populations that will be capable of maintaining themselves. These are species that were once in Kansas, but could not keep up with the changing times brought on by the White Man invasion. Two of the restocking programs
concern the River Otter and the Pronghorn. The success of the River Otter has not been determined as yet; the Pronghorn Flint Hills introduction seems to have failed or is limping along at best. There seems to be more hope for the Pronghorn in northwestern Kansas. It may take more introductions to get these eastern populations going.

Really exotic introductions of African and Asian large game mammals have been made in western Texas and some other southwestern states. So far we have had little of this in Kansas. A few ranchers have had European Deer, Llamas, and such on their spreads, but they are more in the nature of domestic stock than wild populations.

SUMMARY AND CONCLUSIONS

So we see that over years, centuries, and millenia, changes do take place in the population composition of organisms occupying a given region. Succession is a fact. Right now, we --Humans-- are in charge of things here in Kansas; it was not always so. We are recent Invaders, bringing with us a host of other Invaders and removing many of those species that were here before us.

What is good? Who knows? At least we are trying to understand the relationship of species to species; and we are showing a bit of compassion for those that we are involved with. Let's hope that this will continue.

Remember. We are not the first Invaders; we will not be the last!

IMPORTANT NOTICE

There will be no Numbers 3 and 4 (February and April, 1987) of the present volume (#3). These will not be prepared because economic conditions have caused a serious shortfall in tax revenue for the state. In an attempt to compensate for this, a large amount of operating funds has been cut from the current budget of all state agencies. One of the casualties is the Kansas School Naturalist. We are hoping that this financial situation is temporary and that the Naturalist will be in full production again next fall. We still welcome contributions to the Kansas School Naturalist Endowment Fund. Please send them to Endowment Office, ESU, Emporia, KS 66801-5087.

Thank you for being generous — and for being considerate concerning our deviation in production.