

## FOXES.

The foxes on the Pribilof Islands have regularly been the source of considerable revenue to the United States. The animals run at large on both islands and call for scarcely any outlay of funds and comparatively little labor.

One of the paradoxical features of the fox life on these islands is that the larger island, with a greater abundance of seal meat and more accessible beaches, has constantly furnished a smaller number of skins than St. George Island. Immediate conditions can not be assigned as the reason for this peculiar difference because of the fact that the situation has remained the same over a period of more than 40 years. Methods of feeding adopted on St. George Island in more recent years have caused a still greater contrast in the size of the catches on the two islands.

In the assumption that the foxes obtain sufficient food from the seal bodies remaining on the killing fields and from the natural food on the seashore, no special effort to feed the animals is made on St. Paul Island. The foxes are trapped with common steel traps during a short season in the early winter. When possible it is always planned to do this trapping before the heavier snowfalls take place, so that the runways may be observed and the traps placed on the ground. The time for trapping is usually selected with respect to the condition of the ground surface and the outlook of the weather.

## TRAPPING SEASON OF 1920-21.

During the trapping season of 1920-21 a total of 1,125 blue and 14 white fox skins was taken on the two islands. Of this number 123 blue and 13 white skins were taken on St. Paul Island and 1,002 blues and 1 white on St. George. In addition, there were reserved for breeding purposes on the latter island 242 male and 240 female foxes, making a grand total of 1,485 animals handled there during the winter. The above take is the largest since the winter of 1892-93 when 373 animals were caught on St. Paul Island and 928 on St. George; during that year no reservation of breeders was made, however. The gain in this season's take, as in several past, comes entirely from St. George Island where the herd has been growing rapidly for a number of years.

With respect to the methods in use at St. George Island, Agent C. E. Crompton has recently submitted a detailed report as follows :

## METHODS EMPLOYED IN THE MANAGEMENT OF THE BLUE FOXES ON ST. GEORGE ISLAND, ALASKA.

The blue foxes of St. George Island, Alaska, are the stock of what is probably the most successful fox farm in the country at the present time, if not the most promising in the world. The history of the ebb and flow of fox life on that island and the relation of that fluctuation to the influences which man has directly or indirectly brought to bear form a very interesting nature study.

History states that the furs of the seals, sea otters, and foxes were much exploited during the years immediately following the Russian discovery of the island, but no authentic records prior to 1840 are available. James Judge states that during the 19 years ending with 1860 the average annual catch was over 1,200 animals; during the first 19 years of the American tenure of the island the average catch was approximately 1,000 each season. Trapping was conducted during but four of the six winters from 1890 to 1896, inclusive, and

with such poor results that a total of only 2,325 pelts was secured. These latter years mark the most important changes in the history of the herd.

During the years preceding 1896 the foxes had always been forced to seek their winter food from the summer's accumulation of fur-seal carcasses on the killing fields, and up to the year 1885 had probably secured an abundance of food therefrom. Coincident with the decline of the seal herd, however, and particularly during the *modus vivendi* of 1891-1893, which restricted the land killing of seals to 7,500 annually, pending the award of the Tribunal of Fur-Seal Arbitration at Paris, the number of foxes became rapidly smaller. The situation, however, was not immediately recognized as a shortage of food, the agents of the Government placing the blame on excessive trapping by the lessees.

The state of affairs was probably first seen in its true light by Treasury Agent James Judge, who, in the summer of 1896, prepared a quantity of surplus seal meat by lightly salting and storing the food in the manner of ensilage. The experiment was successful, and Mr. Judge immediately recognized the possibility of selective killing by catching the animals in box traps instead of the steel traps which had always been used theretofore. A trapping house, with a wire cage adjoining, was the final outcome of the above-described experiment. The foxes came readily to the cage to obtain the much-needed food and were caught when the cage door was closed by a rope leading from within the house.

The methods of trapping outlined in the following pages are based on the work of James Judge, to whom much credit is due. That his principle was right and that it has been properly carried out was shown by the catch of 1919-20, when 750 pelts were secured and 454 animals released as breeders; the largest number of skins obtained since 1892-93, and, with a single exception, the largest total of animals caught in any season since the inauguration of the present system.

#### Food.

The natural food of the blue fox of the Pribilof Islands is made up of birds, eggs, insects, berries, miscellaneous bits of animal matter cast up by the sea, and occasionally dead seals, sea lions, walruses, or whales. While such food is plentiful during the milder seasons, it is reduced to the single item of beach food during the winter, when the shore is at times in the grip of frozen spray for long periods. Drift ice also closes the beaches for days at a time and usually large deposits of ice are left stranded, and these hinder the foxes in their search for food. It is at once apparent that comparatively few animals would survive a severe winter without a reserve supply of food.

In ordinary seasons the foxes of St. George Island are dependent upon a reserve supply of seal meat as food from September 15 to April 30. These dates are very safe and they will, of course, vary as the seasons are mild or severe, early or late, but will in most instances mark the period of need. "Open" or unfrozen beaches during the winter time often furnish much additional food, and during such intervals the foxes feed but lightly on the seal meat. On the other hand, a protracted period of cold prevents the animals from obtaining the natural food of the seashore, and they then visit the feeding ground in large numbers, consuming surprising quantities of meat. This feeding is necessary by reason of the fact that there are on the island at the present time many more foxes than the comparatively small supply of natural food in the winter season can support, and the size and rate of growth of the herd are primarily limited by the number which can be sustained during that trying period.

*Preparation of food.*—Seal meat has been found to be a successful and most readily obtainable food for use as a reserve. The foxes use all the seal meat which is not consumed by the native inhabitants of the island. After a killing of seals has been made the natives cut up the carcasses, remove the choicest portions for their own immediate and future needs, and the surplus is stored for winter fox food. At a suitable time (usually the day following the killing) the carcasses are eviscerated and emptied of free blood clots to retard putrefaction. If large, the carcasses are cut into sections, but if the seals are of a size readily handled they may be stored whole. It is not a good practice to store the meat before it has cooled, nor should it be left on the field through a hot, sunny day.

The carcasses are deposited in a large pit or silo, which is cut into the side of a hill of hard, scoriaceous earth. The outer side of this pit is bulkheaded

with strong planks and a small doorway, closed by means of flashboards, is placed near the center of the base of the bulkhead. This door serves both as a drain for the effluent water and oil and as a port from which the meat may be drawn as needed.

As the meat is thrown into the pit it must be spread about evenly and sprinkled with a small amount of half-ground salt. Salt which has already served a part of its usefulness in the sealskin kenches is entirely satisfactory for salting fox food. It is of great importance to have the meat spread in such a manner as to leave as little air space as possible; the principle is primarily that of ensiling rather than salting. It is surprising how well the meat will be preserved with but very little salt if the air is properly excluded.

After the summer's sealing has been completed the silo is covered with a sectional hatch, which rests on the edges of the pit. It is not of advantage to store the seal meat resulting from the fall killings, as the natives take large quantities for salting and freezing and the foxes will consume the fresh remains in a short time.

Before the feeding of the reserve food begins it should be freshened by the passage of fresh water through the pit. This is done by laying a pipe line to a siphon, which draws the water from a lake near by. The water should run at least two weeks steadily, but must not be turned on until the time for feeding draws near, else the food will begin to decompose unnecessarily.

*Feeding.*—Having decided that feeding should begin, a supply of the prepared meat is removed from the silo to the food kenches in the trapping house, where it may be drawn upon with ease as required. The native foreman is then instructed to put out a small experimental amount in the neighborhood of the building and to report the following morning as to the quantity consumed. Upon receiving this report the agent will know how to proceed the following evening. It is a commendable practice to provide for a remainder of food each morning, except during the active trapping season, when the animals must not become satiated. The foreman details a single workman to the work of setting out the food for a week at a time, after which that man is relieved by some one who does the work for a similar period.

The feeding is continued in the neighborhood of the trapping building until two weeks or more before it is expected to begin trapping, at which time it is placed within the cage. Much smaller quantities of food are then put out, and it may be well, in the case of a mild season, to suspend feeding for a day or two, putting out only enough food to attract the animals to that vicinity. This must be decided and gauged by the manner in which the foxes have been feeding during the interval immediately preceding, and it is largely a matter of judgment.

When the beginning of trapping has been decided upon all waste bits of meat and bone are gathered together and stored in barrels in an inaccessible place, where they will not draw the foxes from the lure within the cage. After trapping has started, food is placed only within the cage and the accumulation of bones therein is cleaned out from time to time and disposed of as stated above. Bits of food which have been dragged outside the cage must not be allowed to accumulate, as the more timid foxes will feed on them in preference to entering the cage.

#### Trapping.

*Season.*—The season for trapping prime-furred foxes varies in direct relation to the degree and duration of cold weather. Ordinarily the best of the pelts will be secured between December 1 and February 1, though prime furs may be taken on either side of these extremes.

Toward the latter part of November a few foxes may be caught and the fur examined as to its marketable condition. The extent of growth of the guard or crown hairs is a very good guide, as when these hairs have reached a length extending well beyond the heavier fur the pelt takes on its well-known silkiness and luster so highly valued by the trade. The guard hairs are seldom, if ever, fully extended before the fur beneath has become prime. Many skins vary as to fur; some have a heavy growth of dark fur, while others may have comparatively thin coats of light color, but the primeness consists in a uniform growth of whatever class of fur the animal happens to have, accompanied by the full growth of guard hairs. Animals are occasionally seen with no visible growth of guard hairs, but these are presumed to be diseased and are so few in number as to be negligible.

During mild seasons it will be noted that some of the pelts have a decided reddish tinge to the guard hairs, and while the exact effect of this condition is not known to the writer, it appears that its presence is not of sufficient importance to warrant the cessation of trapping. In the two seasons of 1915-16 and 1919-20 this "rusty" condition was particularly noticeable, but on both of these occasions the furriers subsequently stated that the value of the skins was but slightly lessened thereby. While the darkest furs are the most desirable, a good pelt commands a fair price even though the reddish tinge is in evidence.

The approach of the end of the season and the lapse of primeness in the skins can not be determined by any rule. The condition of the fur must be carefully watched, for rubbed or felted patches about the throat or rump are a certain indication of unprimeness. The observations must naturally be made before the fox is killed.

*Weather conditions.*—There is probably no single indirect factor having a more important bearing on the outcome of the season's trapping than that of weather. Clear, cold nights, with moderate winds from points in the north or east, are the conditions under which trapping may best be conducted at the village. Western winds favor the Zapadni cage. High night tides are advantageous, low ones the contrary. While moonlight makes the trapping work easier, the animals may be seen without difficulty on the darkest night if there is a little snow on the ground. The lower the temperature and the longer the period of cold, the more favorable is the situation; the cold keeps the beaches frozen and the continuation of it forces the most timid animals to visit the cage in search of food. Storms do not necessarily preclude trapping if the winds are from favorable directions and are not exceedingly strong. Wet snow or rain is unfavorable, as the furs become wet and soiled on such occasions; this dampness is very undesirable when the skins are made ready for stretching. Trapping may, however, be conducted with fair results during mild weather when rain is not falling. Persistence is required if a large catch is to be made.

*Location of traps.*—Two cage traps are used at the present time, one at the village, the second at Zapadni. The advisability of installing a third is doubtful. The second trap was the natural outcome of the feeding of foxes at Zapadni and it is useful when winds are unfavorable for work at the village. The desirability of securing the largest number of pelts at the village trap is readily seen.

The village trap is the original building set up by James Judge shortly after his experiment of 1896, and, like all cage traps, it is near the shore line. The second is simply a wire cage set up in 1919 close by the Zapadni watch house. Efforts are occasionally made to secure foxes at Garden Cove (on the southern shore) by means of string or noose traps, but the results are quite disproportionate to the labor involved. It should also be mentioned that the foxes having their homes in the immediate vicinity of the village form a distinct colony, the members of which rarely visit the cage trap and must be obtained by noose traps placed within the village and operated from the windows of the village buildings.

*Description of traps.*—Herewith is a diagram showing the arrangement of the village trap. The drop door "F," sliding in a groove, is operated by a man stationed within the darkened room "B," who watches the animals through the small window "H," which commands a view of the trap interior. The Zapadni trap is on the same general plan, the cage standing apart from the house and being operated from the window. At Zapadni the foxes must be caught and removed from the trap by hand, while at the village it is much more readily done, as will be seen later.

The noose trap is a very simple arrangement. A small doorway is cut in the end of a common packing case, which is then placed with its open face to the ground, the door remaining open on the end of the case. Some bait having a strong odor, such as old seal meat or seal oil, is placed within the box, and a noose is hung about the doorway. As the fox endeavors to investigate the contents of the box, the noose is closed about his neck by an operator stationed within a near building. This trap is an unsatisfactory arrangement to use outside the precincts of the village, as when an animal is captured the resulting commotion frightens other foxes away from that neighborhood. Furthermore, but a single fox can be caught at each operation.

*Operation of traps.*—It must be borne in mind during the trapping season that the foxes are largely dependent upon the seal meat for their sustenance,

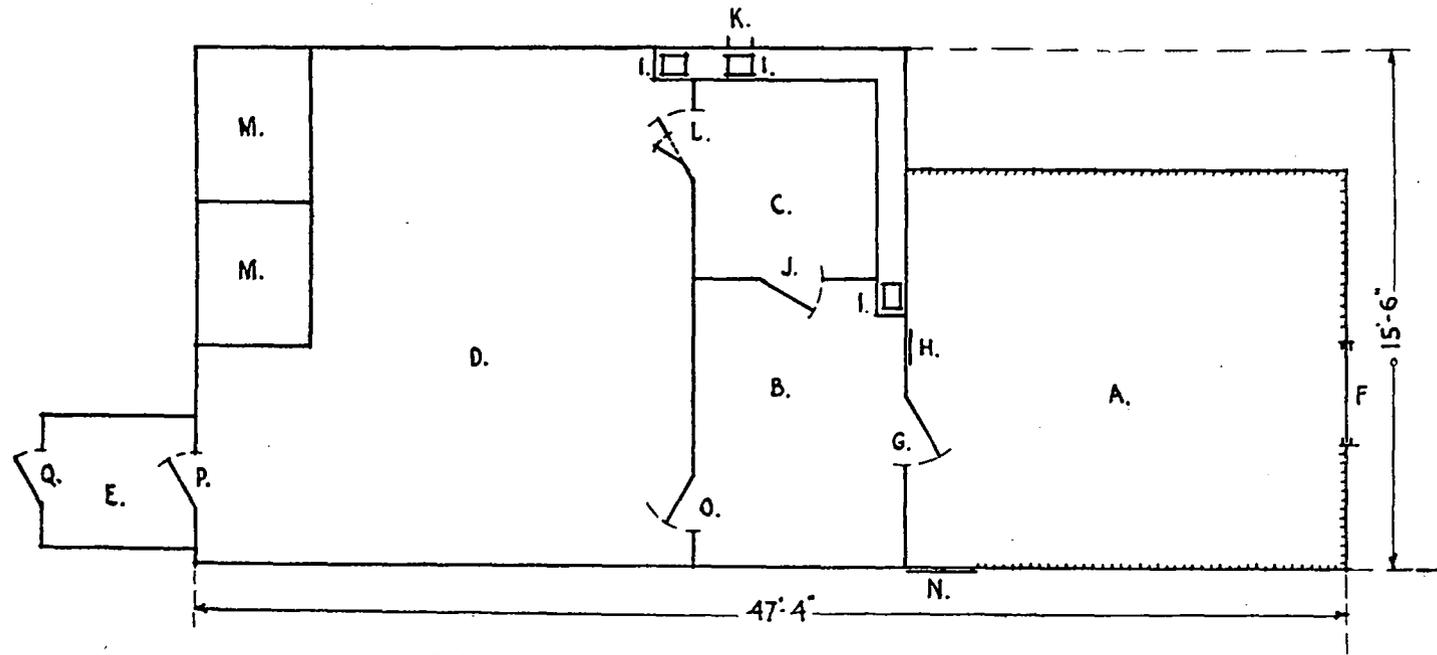


FIG. 1.—INTERIOR ARRANGEMENT OF FOX-TRAPPING HOUSE.

- A. Wire cage trap.
- B. Trapping room.
- C. Retaining room.
- D. Killing and skinning room.
- E. Vestibule.
- F. Sliding drop door.

- G. Trap outlet.
- H. Small window.
- I. Exits for releasing foxes.
- J. Door to retaining room.
- K. Final exit for released foxes.
- L. Special door to skinning room.

- M. Food kenches.
- N. Food door.
- O. Door to trapping room.
- P. Entrance.
- Q. Storm door.

and, while large numbers of animals visit the cage in the morning after an evening's trapping, continuous operation of the trap over too long a period will cause the foxes to abandon their trips to the cage for food. Such a practice forces the foxes to search for food elsewhere and also prevents any record being made of those animals, either for their pelts or as breeders. The more timid foxes may be seen to wander about the trap for long periods before entering, and each time the trap is sprung these animals are frightened off. The writer believes that the trap should be left open to the foxes at least two full nights in seven, and if all-night trapping is practiced the feeding nights should be increased to three in each week. These precautions are not so necessary if the beaches are unfrozen.

The actual trapping of the foxes may be begun as early as 4.30 p. m. and continued as late as seems desirable. A responsible native, with an assistant, takes up his position in the trapping room opposite the small window and opens the sliding door by means of a rope. The opening of the door by the trapper exposes the food for the first time on any trapping night, so that no foxes will have previously satisfied their hunger. The trapper maintains a constant watch of the trap, and when several foxes are in the cage he lowers the door and imprisons them. This moment for dropping the door must be properly judged. There should be no foxes so near the door that they will be in danger of injury when it drops; the door should not be closed in the face of animals too near the trap, as they would only be unnecessarily frightened thereby; on stormy nights the door may be so carefully closed that even the foxes within the trap are not aware of the change. Only responsible natives should ever be left in charge of the trap rope; such men understand the foxes and do the work well.

After closing the trap the operator sends his assistant into the cage and the foxes are driven through the open doors "G" and "J" into the retaining room "C," where they are held until a sufficient number has been caught to warrant further attention. After closing the doors to the retaining and trapping rooms the cage door is raised and the operation is repeated.

*Handling of animals.*—It is not advisable to hold more than 20 foxes in the retaining room at one time, as the animals have a tendency to clamber about and will pile up and become overheated, particularly in mild weather. On the opening night of the season the foxes can be caught almost as rapidly as the skins can be handled, the trap taking as high as 10 or 12 in a single operation. Later in the season the more timid foxes appear and only 2 or 3 are taken at intervals of an hour or more.

When a suitable number of foxes has been caught, the skimmers and other men take up their places in the large room "D" and the work begins. Two or three men, armed with forked sticks, are sent into the retaining room, where they catch the foxes by pressing them down to the floor until a proper hold has been secured with the hands; the animal is grasped about the neck from behind. This work must be done with as much care as is consistent with a fair degree of speed, as some of the animals are to be reserved as future breeders and must not be injured by unnecessarily rough handling. If any marked breeders are found, they are liberated through the door "I" and the exit "K."

After catching the fox the native passes it through the opening in the special door "L," whereupon a man on the opposite side takes it from him, holding the animal in the same manner. Another man examines the fox and calls out its sex that it may be written down by the agent. The latter then examines the teeth by pushing back the lips or opening the jaws with a soft gag.

The weigher now places the fox's tail in the loop of a broad strap attached to a spring balance and the head of the fox is then carefully lowered so that the animal hangs to the scale by its tail. The fox must not be dropped into a hanging position, as the sudden snap might injure the bone or cartilage of the tail. The weight is then called out and the agent makes note of it; he then notifies the weigher whether the fox is to be killed or released. If to be released, the animal is marked and dropped through the door "I" and makes its escape through the exit "K." If to be killed, it is passed to another man (the fox is still held by the tail) who strikes it a smart blow on the head with a light club. After the fox has been stunned in this manner, its neck is broken by manipulation. The skinner waits a few moments to make certain that the animal is dead, after which he removes the pelt while the body is yet warm.

## Handling of Skins.

*Skinning.*—Fox skins are removed much in the same manner as those of most fur-bearing animals that are prepared for the market. The tail is split for a few inches on the lower side, the cut beginning at the anus; cuts are then made along the inner side of each hind leg, these incisions extending from the heel (the lower end of the metatarsal bones) to the anus. The pelt is first loosened around the base of the tail, the tail is then pulled from its sheath of skin, and the entire pelt is removed by pushing it loose from the fat and flesh with the fingers, a knife being used only about the head. After the skin has been loosened from the posterior part of the body it is simply everted over the head, so that the nose is the last part to be severed. The forelegs are pulled out of the skin without any cutting, except where a knife may be needed to separate the pelt from the tougher subcutaneous tissues.

While the skin is being drawn off there is some danger of tearing it or of forcing a finger through it, but such holes are usually the result of haste or carelessness. However, tears are sometimes made by the best of skinners, and in a large catch it may be difficult to secure perfect work throughout. Naturally, the pressure is always toward better workmanship.

After the skin has been entirely removed by the method outlined above, it is turned right side out and hung up on a peg or nail. When the work of the evening is over, the skins are counted, but are left in the trap building until ready for cleaning and stretching; the skins must be kept as cool as possible during this time.

During the first few killings of the season it is advisable to examine the flesh side of the skins, as the color found there is a good guide to the degree of primeness of the furs as a whole. The earliest skins may be found to be rather dark on the flesh side because of the roots of the growing hair and fur. This color fades as the season advances. While the writer has seen skins having what appeared to be fully prime pelage with the flesh side quite dark, it is not advisable to take any large number of skins during that part of the season when the bluish color on the flesh side of the skin is most pronounced.

The flesh side again darkens with the approach of unprimeness, but it has been observed on St. George Island that felted patches and rubbed spots are the first indication of the change. The fact that decision must be made before the fox is killed makes this a valuable point.

*Cleaning.*—The morning after the trapping the skins are taken to another building where the cleaning, stretching, and drying is done. The more skillful men sit in a row behind a beam which is placed in a horizontal position about 2 feet above the floor. A nail or peg is fixed in the beam opposite each man. The skin is turned flesh side out, the nose is placed over the peg and all the fat and flesh is removed with a very sharp skinning knife having a curved blade about 6 inches in length. The tail is split and all the fatty tissue removed from it; the forelegs can be cleaned without splitting. The work described here requires genuine skill with the knife.

After the pelt has been thus cleaned it is taken by one of the other workmen who turns the skin, rubs dry corn meal through the fur for the purpose of removing free grease or dampness, and then shakes it out. It is now turned again and searched for holes and if any are found they are sewed up. Small sticks are then inserted within the skin of the forelegs and bound in place; the tail is spread and bound round a larger stick and the skin is then ready for the stretching frame.

*Stretching.*—The stretching frame is a very simple arrangement of two light boards (1-inch material is usually used) put together on an acute angle, the length of the sides being in the neighborhood of 4 feet. The boards are joined edgewise, the nails of the joint being carefully toed; no third piece enters into the construction. After the joint has been secured, the boards are planed so that the edges form a smooth wedge with a rounded point. Properly made frames will last many years.

The skin is drawn on by inserting the smaller end of the frame in the opening across the hind legs and then slowly forcing it down the frame until the nose fits snugly. The entire surface of the pelt is then gently stretched downward with the palms of the workman's hands, and when it is well in place the hind legs are spread and bound to the sides of the frame in the manner shown in figure 3. The lips have been previously stitched together to prevent distortion of that part of the skin, and after the whole pelt has been well rubbed with corn meal it is set up for drying.

*Drying.*—The drying may be done in any large room where an even temperature can be maintained. It is always desirable to dry the skins slowly and with as little artificial heat as possible. The present method is to lay the frames in rows across light racks suspended from the ceiling at suitable intervals, the remainder of the frames being stood up about the walls. With the improvement of facilities this practice may be bettered.

After a lapse of from four to six days on the stretching frames the skins may be examined, and if dry all over, may be removed. The nose is one of the last parts of the skin to become fully dry. The skin should also be examined for excessive grease, and if any is found it must be removed with corn meal, for if it is left it will putrefy and weaken the skin. In taking the skin from the frame the hind and fore legs and tail are unbound and the skin gently started with the palms of the hands, after which it may be pulled off by the nose. When the skin has been removed from the frame a tag, bearing the date of capture, is tied into the mouth or eyeholes and the skin is hung up in the drying room for a few days, or until a sufficient number of pelts has accumulated for removal to the storage room.

*Storing.*—The two most important requirements for a storage room are dryness and darkness. The necessity for keeping the skins dry is apparent; the darkness is a safeguard against the fading of the fur, as the darkest furs command the highest prices. In storing the skins they are usually tied through the nose into clusters of 10 skins each, and these bunches are carefully tallied when stored. All the skins are again counted at the close of the season so as to verify the record of animals killed.

*Shipping.*—Fox skins are packed and shipped in boxes made of 1-inch boards of spruce or Douglas fir (spruce is preferable), with inside dimensions of 58 inches in length, 16 inches in width, and 12 inches in depth. The case is provided with a set of battens near each end, which lend rigidity to the whole and at the same time prevent any face of the box from coming into solid contact with a flat surface.

The packing of the skins is usually done within a day or two of the time shipment is to be made. The cases are lined with tarred building paper and relined with wrapping or newspaper as a protection against insects and dampness. The skins are carefully counted and laid flat in the case; unnecessary folding or creasing is to be avoided. The skins are shipped pelt side out. From 40 to 45 skins may be packed in a case such as the one described above.

After the proper number of skins has been packed in the box, the top is closed with the layers of paper and then the cover. The cover is nailed to the sides and ends of the case and to the battens on the sides. All cracks and holes are then closed by tacking on strips of galvanized iron or sheet zinc. The cases should be marked on both sides with the name and address of the consignee, the serial number and gross weight of the case, the number of skins it contains, and the legends, "Keep Away From Boiler Bulkheads" and "Keep Dry."

#### Disposition of Carcasses.

The disposition of fox carcasses is a matter of some importance. It is well known that foxes are, as a general rule, infested with parasites and intestinal worms of various kinds, and it should always be the effort of the agent to see that the carcasses of foxes killed are disposed of in such a manner as to prevent any possibility of infection from that source. The bodies of foxes found dead should be handled in a similar manner when practicable. The method now in use is that of putting the bodies into a covered pit, a practice both simple and effective.

#### Breeding Reserve.

*Selection of animals.*—The breeding foxes must be selected with care. The points of judgment are: (1) The condition of the teeth; (2) depth of color and condition of fur, short fur or white patches indicating an undesirable animal; and (3) weight, reserved males to weigh not less than 11 pounds and females not less than 8½ pounds. Cripples are always killed, though a short-tailed fox may be released if the animal appears to be a particularly desirable one from other points of judgment.

Since the beginning of the present method of handling foxes on St. George Island it has been constantly the purpose to eliminate the white foxes. That it has been partially successful is shown by the presence of only 4 white

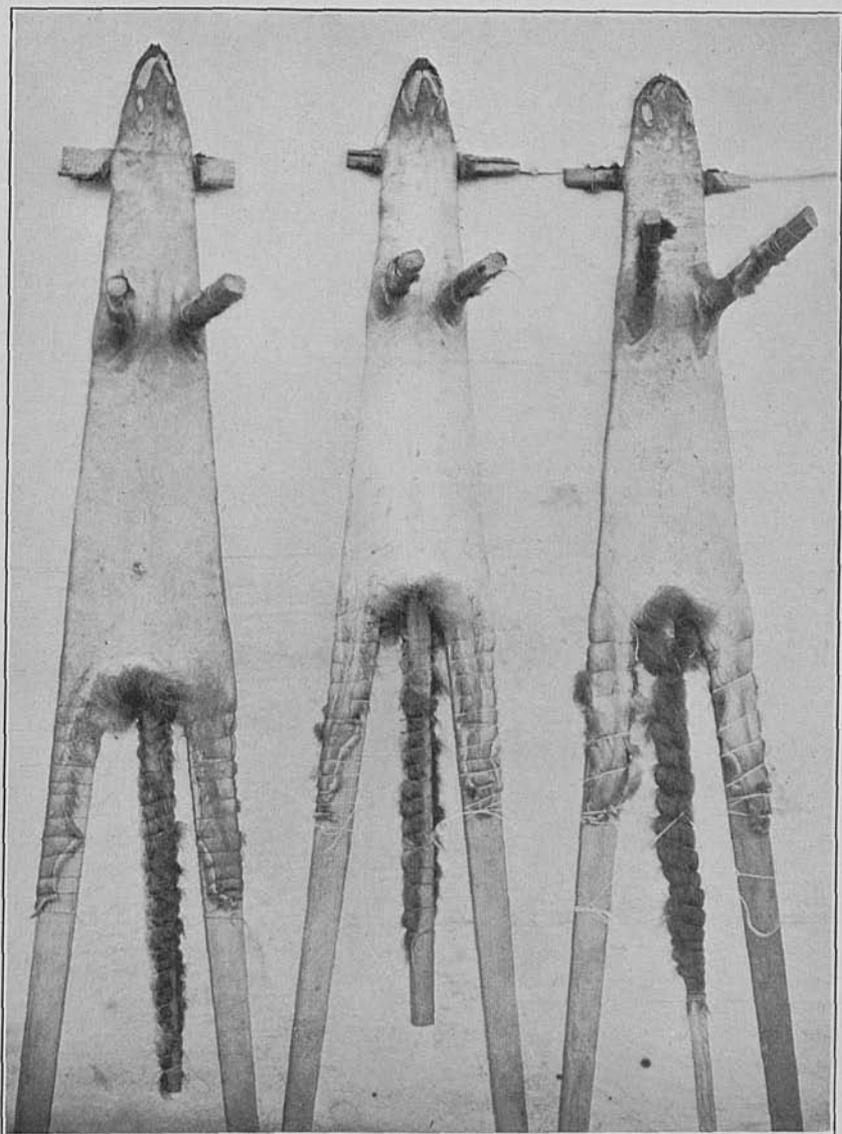


FIG. 2.—NATIVE METHOD OF STRETCHING AND DRYING BLUE FOX SKINS, PRIBILOF ISLANDS, ALASKA.

skins in a catch of 750 taken during the season of 1919-20, as against 15 white pelts in a total of 486 secured in the season 1903-4. On St. Paul Island, where steel traps are being used and the selective killing is not carried on, 33 white animals appeared in a catch of 188 during the winter of 1919-20. The fight against white foxes on St. George Island has in recent years been extended against blue foxes which bear white marks of any kind.

After the selection of the breeder it is marked by clipping the fur of the tail and is then released. This mark is a notch near the tip of the tail in the case of a male and near the middle of the tail for a female. No such marked foxes are killed intentionally, and to avoid the possibility of such error it is a good plan to make the mark sufficiently plain to preclude any chance that the weigher may not notice it. Light marks made early in the season may grow to be almost indistinguishable before trapping stops.

The blue fox of St. George Island is monogamous, and because of this fact the sexes must be released in equal numbers when the reserve is made.

*Size of reserve.*—The amount of food available during the winter months is the factor which controls the size to which the herd may be allowed to grow. The release of 200 pairs of breeding animals for a number of years past has provided a steady supply of skins, but this number must be gradually increased in proportion to the food supply if a sound policy of growth is to be carried out. During the season of 1919-20 a reserve of 225 pairs was made with a view to such a growth, and it is intended that the reserve be further increased each season that the food situation will allow.

A consideration of the reserve naturally must bring in the factors of the number of young which reach maturity for each pair released and the percentage of natural mortality for all classes of foxes. It is to be deplored that we know little of these factors, except as light has been thrown upon them by the growth or decline of the herd. From the past rate of growth we may assume a given number of maturing young and a given death rate, both of which are subject to an unknown correction of animals not caught, but such figures are somewhat arbitrary and must be used with caution. We can not place dependence on the uncertain figure of the number of maturing young or the unknown reserve of animals not handled; the only reliable figures are those from known reserves, and it is upon these we must base our policy.

# **National Oceanic and Atmospheric Administration**

## **Report of the United States Commissioner of Fisheries**

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