OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

06451

Distr.
LIMITED

ID/WG.157/5
12 July 1973

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

Workshop on Leather Industry Development
in Developing Countries

Vienna, Austria, 27 August to 1 September 1973

PROSPECTS FOR THE DEVELOPMENT OF THE FUR INDUSTRY IN DEVELOPING COUNTRIES 1/

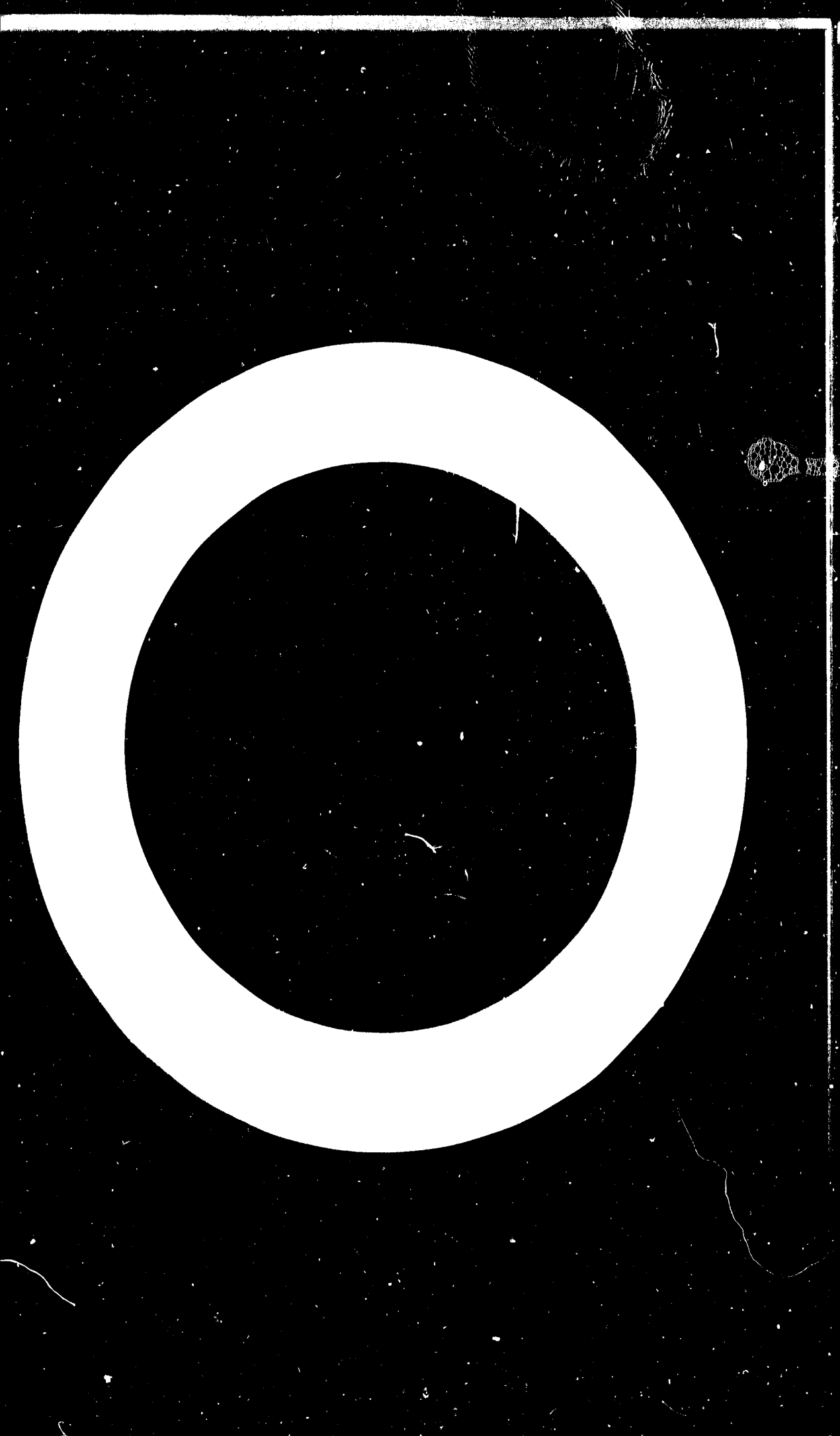
by

Thomas C. Thorstensen
Director, Thorstensen Laboratory
Westford, Mass., U.S.A.

1/ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

id.73-4903

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards even though the best possible copy was used for preparing the master fiche.



INTRODUCTION

Since before the beginning of recorded time furs have been an important part of the life of man. Furs were the earliest type of clothing for primitive man and most primitive types of tannages have been used for the tanning of furs. In tropical climates furs were chosen for their beauty and their exotic color and texture. In artic climates furs are used for warmth. The types of tannages and preparation of the skins are a matter of using the local materials with consideration for the ultimate use of the final product.

Decorative furs in the tropics can be dried, vegetable tanned or possibly smoke tanned. In the artic climate the tannages are usually based on the effect of the oxidized natural fat of the skin. The utilitarian furs of the artic are made into parkas and boots which are quite satisfactory and will keep the wearer warm, although skins tanned in this manner would have no value in a temperate or tropical climate since the bacterial attack would occur rather quickly.

Furs have been designated to be the clothing of royalty and different types of furs have been used to designate the rank of individuals in society in a wide variety of cultures. These practices are still in existence today in many societies.

In consideration of the economic aspects of furs we should limit ourselves to the production of skins that are of true economic value. There has been some concern among many people

that the fur industry is enforcing the slaughter of many species throughout the world. As a result of concern for endangered species there has been some thought that the furs should not be worn in order to preserve the natural animals. It is true that the searching for particular types of skins, namely spotted cats and tigers, etc., have resulted in the decrease in the number of animals and many animals are on the endangered species list. On the other hand some fur bearing animals have been very finely bred, and are now in abundant supply in fur farms. Such animals would not even be in existence if it were not for the highly developed, sophisticated fur industry in the advanced nations. We can, therefore, divide the available sources of raw materials for furs into two types of sources:

1. Wild Animals - In this classification we would include all of the wild animals that are used for furs such as wolf, some types of fox, natural mink, marmot, jackel, muckrat, racoon and others.
2. Domestic Animals - These furs include animals that are raised primarily for their fur, but may have other economic value such as food and clothing. We would consider that ranch mink and certain types of foxes which are bred in captivity and fed for fur use are in the true sense domesticated animals.

In considering the relationship between the fur industry and the emerging nations, perhaps it would be better to consider them not as emerging nations, but rather emerging people. In some areas, even the most advanced and sophisticated countries such as Canada, the United States, Russia, the countries of Europe and Australia, certain areas may be devoted to the development of furs. Other sections of the same highly industralised society may be strong consumers of such furs. Canada is a good case in point. The Canadian fur industry is quite large, yet furs are not predominately for export, but they are used within Canada. The industry of Canada supplies a definite need of the people of Canada for warmth in some areas and for fashion appeal in others. The search for furs during the 1700 and 1800's led to much of the development of the opening of the wilderness of Canada as the search for spices led to the opening of many of the paths to India and the Far East from Europe. Furs, therefore, have been an important economic factor in world trade and world commerce.

THE FACTORS NECESSARY FOR A VIABLE FUR INDUSTRY

A fur industry in emerging nations requires several different things, but first there must be a supply of animals with sufficently good quality fur to make the skins marketable.

If such animals are in large abundance they probably would be hunted by the local people and the marketing route well established. In remote areas it is very difficult to maintain a control over the slaughter of wild animals. In such areas there often are tribal people with traditional hunting patterns who consider the taking of animals for furs their privilege and thought for the preservation of the species, the keeping of animals for breeding and the proper feeding of these animals for another season are usually beyond their comprehension. Such supplies may dwindle very quickly and can not be considered to be proper fur sources. An additional factor is the method of taking the animal. The animals must be hunted, trapped and killed in a manner to eliminate most of the damage to the skin at the time of trapping or between the time the animals are killed and the skins are marketed. It is, therefore, necessary to have certain field preservation techniques known to the people who are doing the trapping.

While fur bearing animals are in relatively remote areas and the educational level of hunters and trappers might be quite low, the preservation of the skins that are taken are usually done by traditional methods. These are well defined and well understood by the trappers; they are methods that have been envolved over a period of many centuries.

Once the skins that have been field-preserved are marketed, they are brought to a central place where a dealer or broker

buys the skins for resale. The skins are usually graded on an individual basis and the price negotiated on an individual skin basis. The dealer must accumulate many skins in order to have sufficient numbers of similar quality color and size to be of interest for commercial purposes. The dealer may buy from many different trappers and may find it necessary to travel great distances to accumulate the skins. He may further treat the skins to protect them and make them more presentable for marketing. An additional cure may be involved and/or more preservatives added.

A commercial lot consists of tens of thousands of skins that are then resorted and sold by the dealer to the manufacturer or a broker. The skins are further processed, tanned and dyed to make them useable articles of commerce. The tanned and dyed skins may be again sold prior to reaching the garment manufacturer. The garment manufacturer may or may not own the skins that he is working into garments. The garments may be made on contract for the wholesale or retail outlet.

It is the nature of the fur business to be a very high risk industry. The trapper has a very uncertain catch and seasons of very low personal income. The dealer buying the skins from the trapper takes a risk that the skins might not be properly preserved or the proper grade to have appeal in the present market. The skins must be processed properly,

i.e., dressed and possibly dyed. This is done with some degree of risk in the tannage as a small amount of hair damage (or hair slip) would be disastrous on the value of the skins. The dealer must grade the skins and put them into the proper lot for sale to the garment manufacturer, either before or after the dressing.

Quality skins, available in sufficient quantity, are carefully sought for, but in any mixed lot there are a number of skins off-color, off-size and off-grade, to be sold at a lower price. In dressing the skins there is always the danger of damage during tannage or coloring due to improper processing.

The garment manufacturer buying the skins runs the risks that are normally associated with selling a luxury item at a very high price. The fur industry, therefore, is one of considerable risk, both financial and technical, from the time of the slaughter of the animal to the final retailing of the garment. The high costs of fur garments, therefore, are related to the economic practicalities of grading, skin spoilage and trends of fashion.

A good system of commercial marketing in all phases of this chain must be achieved along with sufficient volumes of skin production to have a significant economic impact.

FUR BEARING ANIMALS

Fur bearing animals of commerce are ranch type and wild. Each of these has its place in the commercial world and the world of fashion. Their role depends upon availability, consistency of quality and the cost. The whims of fashion play an important role in the use of furs in that there is an interrelationship of prices. When one fur becomes very scarce and consequently quite expensive, this will be reflected in a greater use of furs of the more available type and consequently an increase in price in those furs. In natural animals there is a tendency for prices to fluctuate on approximately a 7 to 11 year cycle related to available food sources of the animals.

Rabbits and small animals are a food supply for the predator fur bearing species and their availability may greatly affect the population of the desired species, which consequently may effect the price and availability of the skins.

The following animals listed below are animals which have been important as fur bearing species. Some of these are now ranch animals and others, due to over hunting and scarcity, are no longer commercial sources of fur.

BEAR - Common bears of the world have generally very long shaggy hair that is not satisfactory for garments. They are, however, useable for trimming and rugs, particularly the close, short hair of the polar bear.

Polar bear fur is quite glossy and it is used in the rug trade. Bear is not a significant factor in the world fur market.

BEAVER - Beaver was at one time quite common in Europe and Asia as well as in the United States, however, they are now almost extinct in the old world and they are found almost exclusively in the cold climate areas of America and Canada. Through conservation efforts of transplanting beaver, the spread of population and the total production now totals approximately 450,000 pelts annually. The beaver exported from the United States is no longer significant, but beaver are imported from Canada in quantities approaching 200,000 per year.

CHEETAH, COUGAR, TIGER AND LION - Large cats and spotted cats are predators which have been sought as trophies and used as rugs. Extensive hunting of these large animals has decreased their population to the point of being in danger of extinction. These skins are no longer significant in the world fur trade.

LYNX, WILDCAT AND OCELOT - These smaller cats are more plentiful. Their furs measure from two to four feet in length. They find acceptance in the trade for both fur coats and trimming. The quantity, however, is very small and they are not a major part of the world trade in furs.

WOLF AND COYOTE - Wolves are available in skins that average 160 cm in length and sometimes measure as much as 220 cm. Their colors vary considerably. They are mostly grey and brown. The skins are available in both America and Europe and differ somewhat in their texture of fur. The American Coyote is a bit smaller, available in the United States and Western Canada and vary in color with a rather shaggy fur. Wolf and coyote fur is used for jacket trimming and production may vary between 10,000 and 25,000 skins annually.

WEASELS AND ERMINE - Weasels and Ermine are found in North America and Europe and Asia and they are noted for changing color with the seasons. The white weasel of the winter time is known as ermine and the whiter the color, the more valuable the fur. The skins are quite variable in size, varying between 15 cm long and up to 45 cm long with a 15 cm tail. The fur is short and of fine texture and very valuable.

FOX - Fox is available wild or ranch type. The wild fox is of a red color and the color varies from red-orange to brown and is used extensively for trimming and neck pieces. Extensive farming of foxes has been done in the United States, Canada and Scandinava with the development of various skins to give desirable colors. Silver fox and

FOX (CONTINUED)

black fox are color phases of the red fox. There is considerable quality variation in fox skins depending upon the location and the season in which the skin is taken.

GOAT AND KID - Kids are produced in almost every country in the world with a wide variation in quality depending upon the breed of the goat and the country of origin. The finer goat skins and kid skins used for furs are produced in Ethiopea. Kid skins have not enjoyed great popularity in the past, but in recent years have become quite popular in low priced garments of both the hair-in and hair-out variety.

RABBIT AND HARE - Rabbit is one of the worlds most numerious and prolific fur bearing animals. They have been used extensively for fur throughout the world. Through the skill of the fur dresser and dyer, rabbit may be made in a wide variety of textures and colors made to look like more expensive furs. Most of the rabbit furs used come from Australia or Europe. Varieties from France, Belgium, and Italy are considered to be of the finest quality for both fur and leather making properties.

MINK - Mink is the most important fur in the world fur trade. Wild mink can be found in Canada and the United States as well as the northern portions of Europe and Asia.

Mink vary in size and color in the wild state. Mink ranching is extensively practiced in the United States, Canada and Northern Europe. Most of the mink in American and European fur trade are ranch mink. The science of mink ranching is highly developed and described in detail in other sections of this report.

MUSKRAT - Muskrat is the wild pelt which is found most extensively in North America. Substantial quantities are produced in Russia and Finland also. The skins are less than 60 cm long. They are trapped by trappers on a part-time basis or a hobby basis by most people. Because of the large number of skins produced, they are one of the most important furs in the North American fur trade. The United States produced up to 20,000,000 pelts per year.

NUTRIA - Nutria is a type of beaver indiginous to South America. Trapping of the furs in South America, particularly Brazil, Peru and Argentina almost caused the extinction of the Nutria, but development of conservation laws and fur farming has developed to a commercial level. The animals were released in the swampy country of Southern United States where they have bred extensively and now the current production of wild Nutria in the United States is in excess of one and a half million pelts per year.

OPOSSUM -Opossums inhabit the United States, Argentina and Brazil and are related to the possum of New Zealand. New Zealand opossums are considerably larger and can be sheared and made into garments. The fur is moderately priced and is a small, but significant factor in the American fur market.

OTTER - There are two types of otter, the land otter and the sea otter. The sea otter is large and is more rare and is not used in the fur trade. The land otter has a pelt between 100 cm and 130 cm long which is used for coat trimming. In the United States the fur is used for women's sport coats and jackets in the middle to upper price brackets. The quantity consumed in the United States has been close to 50,000 skins per year over the past decade.

KARAKUL - The second most important fur from a dollar volume point of view is the Karakul lamb produced in Afghanistan, S. W. Africa, Russia and a few other countries. Karakul is discussed extensively in other sections of this report.

SEAL - Two types of seal are used in the fur trade. The fur seal which has a thick soft coat of silky fur and stiff, long guard hairs, and the hair seal which is more coarse. The fur seal is used extensively for fur coats. Fur seals are dyed before processing to bring them to a uniform color. The color of the fur seal ranges from yellow-brown to grey, to dark brown. The under fur is a pink color. When well-tanned

SEAL (CONTINUED)

the fur is exceptionally pliable. The slaughter of the seals in the islands of Alaska is now carefully controlled to prevent the extinction of the species. The hair seal is used little by the fur trade except the very young of the species. Both the hair and fur seal are an important export of the Canadian countries.

IMPORT DUTIES ON FURS AND FUR SKINS

Furs are recognized as luxury items from an import duty standpoint and in most countries, as with leather and raw skin, the import duty on furs in the undressed state is usually considerably less than it is in the dressed state. The duty may also vary depending upon the type of animal and the country of origin. The duties in general are considerably lower on dressed skins than on finished articles of clothing, again reflecting the desire of countries to keep the labor within their own country as much as possible.

MINK

Wild mink are found in the United States, Canada and the Scandinavian countries. They are also found in China, Russia, and Japan. The best pelts come from North America. In the wild, the mink are quite dark in color and about 40 to 50 cm. long excluding the tail. They have a soft, dense underfur which varies in color from a light yellow to a rich chocolate. The animals are found in wet areas in northern and temperate climates. The significant wild mink taken for the world commercial market are approximately 90,000 taken in the United States and 300,000 taken in Canada annually. The quantities of wild mink taken in the United States and Canada have been steadily decreasing in favor of the production of ranch mink. The development of mink farming has brought forth the production of large quantities of mink from a number of countries as indicated in the table given below:

TABLE

Ranch Mink(1967)	Millions
United States	5.0 - 8.0
Canada	1.6 - 2.0
Norway	2.2 - 2.6
Sweden	1.6 - 2.0
Denmark	3.0 - 3.6

TABLE (Continued)

Ranch Mink (1967)	Millions
Finland	2.1 - 2.4
West Germany	.200
France	.200
Japan	.250 expanding

Ranch mink differ from wild mink in that a wide variety of colors are available due to selective breeding and the development of mutant strains. Ranch mink are larger than wild mink, due to the better feeding and the better care taken of the animal. The average adult male ranch mink will have a length of 43 cm., will produce a dried mink skin of approximately 113 gm. with a length of 72 cm. Female mink will average 1,100 gm. and will be about 36 cm. long with a dried skin weight of approximately 60 gm. and the length of the skin approximately 60 cm. There are over 50 recognized breeds of mink, with colors ranging from jet black to white with a broad variety of grey, pastels, browns and tans. To breed mink, the ranch will maintain approximately 4 males for 25 females to produce approximately 100 young mink or kits per year. Breeding takes place in February or March, the gestation period ranges from 38 to 76 days depending upon the time at which the mating occurred. Lactation takes place during the months of April, May and June.

By the end of June the kits are separated from their mother. There are approximately 4 kits to a litter. Although higher numbers can be obtained, there are some losses. During July the kits are becoming large enough so that they begin to fight, and it is necessary to separate them into individual pens and let them develop. They are fed and watered carefully through the developing and growing stages and in November and December the furring will take place. At the proper time judged by the fur farmer, the animals are pelted. The animals are killed by cyanide poisoning or by hand and the skins are put on pelting boards or in a freezer. The use of pelting boards is more popular with Canada and European skins. The convenience of using freezers has led to their widespread use in the United States.

Individual mink ranch cages are approximately 1 meter long by ½ meter wide by ½ meter high. Each with a small nest box and equipped with a feeding board and water. A continuous water supply must be kept for the animals. The animals are fed twice a day. The pens are kept outside or in open shade, with the desired degree of shade and sunlight for the proper development of the animals. Exposure to cold weather is considered desirable to develop a good, thick fur.

Care and feeding of the mink is most important in addition to proper selection in breeding. The diet of the animals is closely controlled. High protein foods are used which consist of fish, meat, meat by-products, cereal, grains, milk, eggs and vitamin supplements. Quantities of food consumed by mink on a mink ranch are very high. An adult male will eat as much as 100 kg of food per year. An adult female about 60 kg. The kits consume about 40 kg of food from weaning to pelting. It is ranch experience that it takes approximately 40 to 50 kg of food to produce each pelt. Since the breeding adults are supported by the harvesting of the pelts of the kits, each kit represents an investment of from $3 to $4 per pelt in food, shelter, and vaccinations to cover the parents. It is, therefore, very important that the animals be properly cared for and the maximum yield in value of the pelts be realized.

Mink ranching can be conducted on a very small scale or conducted on a very large mechanized scale. Mink ranches, particularly those of Europe and many in the United States are small operations where less than 500 pelts are taken per year. The ranches are operated as a side line in conjunction with other crops. The availability of food, particularly by-product foods such as chicken parts or fresh

fish is an important factor in the effective operation of the mink ranch. Mink ranchers of the United States have rather extensive trade associations where technical information is traded at conventions and through the journals. They have shows to display various mink, food and other implements of the trade. The associations also conduct campaigns to improve the saleability of their products. The pelts may be sold in a frozen or dried condition or they may be processed by a tanner before sale. The skins are usually sold at auction, either in the dressed or undressed condition.

FACTORS FOR A VIABLE MINK RAISING INDUSTRY

It is necessary to have good breeding stock which can be obtained from ranches that are engaged in the development of special breeding stock or new breeds can be developed by cross-breeding. Most of the larger mink ranchers are carefully developing their own breeding stock. The small ranchers develop their own line from the relatively limited number of breeders purchased from the outside.

CLIMATE

For the proper development of mink it is desirable to have cold weather for the full development of fur. It is also necessa to have some shade and some sunlight so that the animals can remain healthy during their growth period.

FOOD SUPPLY

The food supply is critical. High quality, high protein food should be available. In the United States and Canada special mink foods are prepared by suppliers having access to animal by-products or fish by-products. Dried fish meals and frozen foods are sold specially prepared for mink ranchers. This is a large business in some mink raising areas. The availability of fresh fish in Scandinavia is undoubtedly a factor in the development of the mink industry in these countries.

HEALTH AND INOCULATIONS

It is absolutely essential that proper diet and proper care of the animals be maintained to prevent development of an epidemic disease. An epidemic disease in a mink ranch can completely wipe out the herd in a matter of a few weeks. Profitable mink raising is a matter of scientific handling of breeding, diet and health care. The last factor for the development of a viable industry is the proper route of the animals from the mink rancher to the sale of the skins. The skins are sold at auction if they are available in sufficient quantity and they are of sufficient quality. The skins can be sold at any number of mink auctions throughout the world, such as Denmark, London or New York and a good value should be received for the skins. The consistency of quality and proper care of the skins are of course of prime importance.

KARAKUL

One of the largest factors in the international fur trade is Karakul. Karakul or Persian lamb is produced in very dry climates with the principal sources being Afghanistan and S. W. Africa. Other sources are Russia, Iran and Pakistan.

Karakul sheep of Afghanistan are a rugged breed of sheep, well suited to the climate and conditions under which they live. For a major portion of the year in Afghanistan the grazing areas are in a semi-desert condition and the sheep must stand a foraging diet and must have the stamina to go long periods of time without water. The Karakul sheep of Afghanistan and many other breeds of this area have heavy fat tails which function much the same as the camel's hump for storage of food and moisture.

The flocks are kept for the most part on the high plain area north of the Hindu Kush and they live either in the plains or the mountains depending upon the season and weather conditions. A large percentage of the sheep population is owned by nomadic people of the area and these sheep may spend the winter and summer in areas as far as hundreds of miles apart.

For the flock owner, the lambskin is a major source of cash income. Flocks may be as small as a half dozen or up to 10,000 animals. The average herd contains between 500 and 1,000 sheep. Of the adult sheep the ratio of ewes to rams is 100 to 150 ewes for 1 ram. The breeding is not scientifically controlled, but good practices are followed. The ewes are ready to lamb in the spring and will drop their lambs during February, March and early April. At this time the sheep are

on a starvation diet and in some cases a full term pregnancy will not be accomplished. The still-born lambs are broadtail and command a premium price. Culling of the flocks will be done at this time in order to obtain broadtails.

When the lamb is born, fur is in the best possible condition. Where sheep have been on the move and conditions have been difficult, the quality of the lambskin will be better. Male lambs are usually slaughtered within 3 days of birth for the harvesting of the skin. The females may be kept as needed to replenish the herd. The number of female lambs that are killed will depend upon the anticipated pasture and will be relative to the size of the herd.

HANDLING OF THE SKINS BY THE FLOCK OWNER OR THE SHEPHERD

To slaughter the lamb, the shepherd will cut the throat of the lamb and the lamb will bleed. A heavy incision will affect the width of the neck on the pelt. In S. W. Africa, a small incision and the spinal cord severed results in a broad pelt at the neck area. Although this method of slaughter causes some waste, it would be impractical to attempt to change this since the method is governed by traditions based on religious beliefs. The skinning techniques on small lambs are excellent and practically no cuts or scores result.

Salt is spread on the flesh side of the skins and the skins are piled flesh to flesh and hair to hair with ample quantities of salt. This salt cure method serves to preserve the skin until such time that they are to be brought to the bazaar and sold. In the bazaar, the skins are sold individually

with a negotiated price for each skin. It is not uncommon to see men at the bazaar carrying from one to a dozen skins for sale. The skin dealers maintain purchasing centers in the bazaar which are typical store fronts. A large dealer may purchase over 100,000 skins. The skins are removed to a warehouse where they are salted and kept until the time of the curing season.

Considering the fact that there are so many flock owners and much of the work is done by nomadic people, curing improvement programs could not be conducted on this level, but rather must be conducted in the cure centers. The shepherds and dealers both know and appreciate the value of the Karakul sheep skins and take very good care of them.

CURING OF AFGHAN KARAKUL

The cure season starts in the spring whenever the weather becomes warm enough and the humidity is proper for drying. Another factor is the cleanliness of the water coming from the mountains. These conditions are usually met about mid-April or early-May. The cure season will last about 10 weeks; a particular yam,(vat) therefore, will be used about 8 or 9 times a season.

The curing of Afghan skins is done in about 6 cure centers located in the northern part of the country. The largest of these cure centers handles about 700,000 skins per year; the smallest about 20,000 skins. The cure system involves a washing

of the skin in clear water to remove the salt and dirt. The skin is then placed in a vat (or yat) made of cowhide on a heavy wooden frame, with a capacity of about 30 gallons. About 80 to 100 skins are placed in a vat or yam along with water, salt and barley flour. The skins are removed regularly and there is a removal of some of the dirty solution during the curing. Salt and barley flour are added to replenish the vat with a greater portion of barley flour being used.

Either before curing with the salt and barley flour or after about 3 days in the cure, the skins are fleshed by breaking off the excess flesh by hand. At the end of 2 weeks the skins are removed from the vats, washed gently on the fur side and air-dried by placing them on a big, hard, flat area. The mud area will take up heat during the day and skins placed on it late in the day will dry during the night. Skins are never dried under the direct heat of the sun, but they are moved into the shade during the hottest times during the day.

The function of the barley flour in the cure is to provide a source of organic acids through fermentation. The fermentation dominates the process and prevents the growth of harmful bacteria. In Russia a similar system is used, but vinegar is employed in a cure system employing paddle vats. Through a USAID program Thorstensen Laboratory has developed a new cure system for Afghan karakul which employs a pre-fermentation of the barley flour and curing in raceway type vats.

After the initial drying, the skins are rinsed in water to remove excess salt and dried again on sand beds. The skins are then lightly beaten to remove surface dirt, trimmed and hand fleshed before sending to a central point for grading.

SOUTHWEST AFRICA CURE SYSTEM

Under the S. W. Africa cure system the pelts are washed in fresh water immediately after slaughter. They are then trimmed and spread on frames covered with heavy hessian cloth. The skins then air-dry in the shade on the frames and remain in a stretched condition since the skins stick to the cloth. No salt is used, but a disinfectant or insecticide may be employed in the last wash prior to spreading to dry. The trim on the skins is more extensive than on the Afghan skins, the head more useable and the feet are removed. The dry cured S. W. Africa skin is thin in appearance and smooth. If the skins are not folded or handled roughly they will not be damaged in shipping. They are clean to the touch and odorless.

GRADING

In the case of the Afghan Karakul, grading has become a very important factor. The cured skins are graded according to color and hair curl into many different grades. A lot of skins is usually sorted twice and as many as thirty different grades may result. Skins of a particular type and grade are then packed into bales for shipment. Each bale may contain from 160 to 200 skins and the number of bales in a lot may

be from 1 to 30. Broadtail may be packed up to 300 skins to a bale. The bales are wrapped in goatskin to protect the skins and allow loss of moisture.

MARKETING

The title to the skins is maintained by the flock owner or broker up to the sale at auction. Auctions are held several times a year, principally in New York and London. European and American buyers will attend the auction. Sample bales from each lot of skins are displayed in a warehouse and no skins are displayed in the auction room. Skins are sold by lot number. The uniformity of grading is very important. In the case of Afghan Karakul the grading is closely controlled by the Afghan Karakul Institute - a voluntary trade association - which has helped very much in building confidence of the buyers in this product.

Processing of Furs

The processing of furs is an ancient art which preceeds the development of the grain leather industry. The fur industry is considerably smaller than the leather industry. The value of the furs is related to the value of the skins rather than the tanning process. The tanning of furs has been kept a jealously guarded secret for many years. In the published references on fur processing, most of them date back at least 40 to 50 years ago, and the methods used are actually quite dissimilar to those in common practice in the fur industry today.

The processes outlined for Karakul and for mink cover essentially all of the furs with modifications depending upon the size of the animal, thickness of the skin and the color effects desired. A fur dresser that is set up to do both Karakul and mink can also do fox, opposum, muskrat, wolf, marten and any of the other common furs. Processing of the furs involves a considerable amount of hand labor and requires individual skill. The development of the colors, the tannages and handling for special effects is an ancient ar and is not one that has reached the same degree of scientific advancement as is found in the manufacture of leather. The skills are quite different and it would be a mistake to expect that a good shoeleather tanner would be able to make good fur skins.

Dressing and tanning of furs is a very risky business and one that even under the best of conditions may result in the loss of a few skins.

The work on the Karakul for black is typical of many black skins. The skins that are handled in an open condition (this is described for mink) is used on types of skins that are processed as rope or cylindrical pelts.

Dressing of Karakul Pelts

Karakul skins, when they are received by the fur dresser, are in the original bales as sent from Afghanistan, Southwest Africa or other sources. The bales are identified by lot number and the individual number of the bale. The bales are opened, each individual skin in the bale is identified with a bale number. This is necessary since the original grading of the skins results in numbers of a particular grade or purchase lot that are not the same as the size of the typical production lot. For example, on the Karakul, the purchase may be made in a lot of 1 to 30 bales which would be equivalent to as little as 150 to as much as 6,000 skins.

The soak is done in a oval or in a raceway type equipment. The ordinary paddle or the half cylindrical paddles, the action would be far too drastic on the skins and part of the fur may be lost. In the case of the Southwest African skins where the skins are very hard and dry, there is a danger of breaking of the fiber and extra care is necessary. When the skins are

soften sufficiently overnight - the skins are paddled for 15 minutes on the hour during the soaking period to soften the skins. This can be done immediately on the Russian skins or the African Furskul. In the case of the Southwest African skins it is necessary to soak extra long using a salt and borax solution to bring the skins back so that they can be paddled without breaking the flesh. The soaked skins are removed from the soak paddle and fleshed, by a fleshing machine similar to that used on goatskins or upper leather manufacturer is used to flesh the Furskul skins.

The African and Russian skins are fleshed in the center of the skin only and the flanks are not run through the fleshing machine. This is done by starting and stopping or opening the machine before the flanks reach the blade of the fleshor. This is necessary since on the Russian skins and the African skins the heads are left on and the heads may contain ears and small horns of the animal. Southwest African skins can be fleshed completely on the machine. Fleshing of the flanks, back and tail areas, is done on the hand fleshing knife. The fleshing knife is a large curved blade. This blade is very sharp and the edge of the blade is hooked so that the fleshing is done by drawing the skin across the blade at approximately right angles to the blade, and the flesh is cut off in a very smooth cut. Another version of this is a circular fleshing knife in which the

blade is similar to that used in a large banana-type hand fleshing blade. A guide is provided to the machine which has the blade rotating so that deep cuts will not be made in the skins. A skilled operator can flesh very accurately and very smoothly on machines.

After fleshing, the skins are brought back to the wet processing for the chrome tanning. Chrome tanning is used on the processing of Karakul skins; alum-tannage is only used when particular special effects or bleaching is desired.

Chrome tanning is done in the oval vats similar to those used for soak and the process is somewhat similar to that used in upper leather. It is a very mild process using relatively dilute liquor and usually takes place overnight. At the end of the tanning process, the fat liquoring oil is added. This is specialty oil which is probably a sulfited oil to make it compatible with the chrome tannage and this simultaneous chrome tannage fatliquor takes place in this procedure. Chrome tanned skins are removed and allowed to drain. The drained skins are then hung on poles to dry. The drying is not done completely but is done under controlled conditions so that excessive hard drying does not result.

The dried chrome tanned furs must then have the fur cleaned and degreased. This is done by a process called break drumming. The skins are placed in a drum to which is added about 140 kg

of sawdust for 500 skins. With the sawdust is added some water and some solvent, usually a high flash point naptha for the removal of grease. The drum is run approximately 3 hrs at which time the skins are removed. To remove the sawdust clinging to the skins, the skins are placed in a cage drum. This is a wire drum in which the skins are tumbled for about a half hour to make the sawdust fall away from the fur. The moisture content and the solvent that is left in the skins at this point is of great importance because this controls the temper and resilience of the skin for the pulling process. The pulling process is a mechanical operation which will soften the skins, open up the fibers and make soft leather. When the skin is pulled there should be a visable color change in the fibers, and the leather, after pulling, should be quite soft and pliable. Pulling is done on two different types of wheels. One is an overshot wheel and the other is an undershot wheel where the skins may be held against the blade on top and loosened by this action. The large narrow wheel is used more on larger skins such as sheep and goat and seal. The smaller wheel is used on most other furs, particularly karakul, wolf, fox and others.

After pulling to adjust the softness of the skins, the skins are again placed in a drum and tumbled with clean sawdust to further clean the fur and the flesh. The used sawdust from the second drumming may be used as a sawdust to supply the first drumming. We have, in effect, the counter current

extraction or cleaning of the furs due to the action of the sawdust on the fur to remove the dirt.

The processing of the karakul now differs depending upon whether the karakul is to be dyed or not. On the skins that are not to be dyed additional drummings with cornstarch and sawdust may be used and leave the original grey and brown color. In each of these cases, the drumming goes on with clean sawdust and moisture content can be controlled in the judgement of the operator to give the proper hand to the skins. At the end of each drumming the skins are removed from the sawdust drum, tumbled in the caging drum to remove the sawdust and again go back through the pulling operation.

In the last drumming there will be some cornstarch placed in with the sawdust. It helps to give sheen and lustre to the final fur. Once again there is a pulling operation after each of the drummings. The skins are now clean and free of sawdust ready to be sent to the garment manufacturer. At this point the identification marks on the skins permit the sorters to put the skins back into the original grades so that they can number up to the individual bundles of the bales as they were received from the owner of the skins.

The fur processor is paid by the owner of the skins on the basis of the skins that are returned. If there is damage to the skins due to processing, the processor will be charged for the skins. Thus, a processor may be charged $20 for a skin lost in processing. If the damage is prior to receipt of the skins by the fur dresser, the fur dresser is not charged for

the skin. This emphasizes the risk in processing the skins which may be borne by the fur dresser. The fur industry in the United States is strongly unionized and high wages are paid to the workers in the dressing plant. Rates are established so that the cost per skin is the same for leather dresser regardless of the number of people employed.

The processing of the skins particularly, in the fleshing area, and other hand operations, is highly skilled.

KARAKUL DYEING

In the dyeing of Karakul for black color, the process of dyeing begins after the first of pulling. After the first pulling the skins are placed in a drum with sawdust only and this is clean sawdust which is then run approximately 3 hours. The skins are then caged and clean skins are ready for dyeing. Dyeing is done with the logwood system. The skins are placed in an oval vat and they are run there intermittently for one day. They are pulled out from the oval vat and placed in boxes. Each day the skins are removed from the box and placed in a different position. One day they will be placed hair up lengthwise; the second day hair up crosswise, the next day leather up - length wise and the third day folded in half hair up. The fourth day they will be layed out straight leather up overnight. The changing of the position of the skins in the submerged blockwood dye brings about for an evening of the color.

The skins are then placed in a oval vat again for washing to remove the surface dye and then centrifuged for removal of the excess water. The skins are then dried. The dried skins are then broken again using the spent sawdust from a white drum. A mild detergent and water maintain the desired moisture content, which is judged by the operator in looking at the condition of the skins and the sawdust. The skins are tumbled for 3 or 4 hours following by a caging for one hour or so. The caged skins are then pulled by the pulling machine and the skins are put back into a finishing drum. In the finishing drum there is new sawdust, no solvents and no water. The skins are run for 3 or 4 hours and caged for another hour and then back to the pulling machine for final pulling. The skins may be run once more in new sawdust to clean the skins again followed by caging.

The clean, finished furs are then resorted back to the original bales and returned to the dealer. Again. at this point the number of skins that are lost or damaged during process are accounted for and adjustment is made in the processing.

DAMAGE DURING PROCESSING

The amount of loss of skins in the processing will vary tremendously depending upon the condition of the cure of the skins. In the case of Afghan Karakul, the losses will be under 2%. The skins are usually well handled in this field and the central curehouse. Techniques in Afghanistan are quite good. The same will hold for the cure by the Russian process. In

Southwest African skins, there may be more damage in the skins due to breaking of the skins in shipment, but the loss in the processing at the dressing plant is approximately the same as with the other karakul.

In the case of the other furs such as mink which is raised as a ranch animal primarily, losses are minimal since excellent care is taken of the skins, by using freezing techniques. In wild skins the losses may become quite high. A classic example is the case of the spotted cats which are taken by poachers in Africa. The spotted cats are then processed into furs and the loss may be as high as 50% in process. This is due to the improper curing and care taken of the skins. Since the skins are taken illegally, often the poachers do not know how to handle the skins. This loss of skins in processing is an important factor in the establishment of proper routes for skins to travel from the wild through the complete fur processing.

PROCESSING MINK

Mink skins are received dried or frozen. They are all in a rope, so to speak, that is they are not split up the belly and the skins are essentially tubular. The mink are quite heavy with the flesh which is heaviest on the head end. If the skins are dry, the heads will be dipped to soften the skins a bit. After the skins are thoroughly wet back, they will be put into a kicking machine to open up the fiber.

structure. The skins will then be placed in an oval tub and soaked overnight. They are removed from the tub, centrifuged and drummed in sawdust to remove the excess moisture from the fur. The mink skins are then fleshed on a bench using the wheel to decrease the thickness of the skin as much as possible. The skins are then placed in a salt soak prior to tannage. Prior to going into the salt soak, the skins may be degreased with a solvent in the sawdust. The skins are then tumbled and caged as was done with the Karakul skins. The skins are tanned overnight in the oval vat using a salt and alum tannage. The tanned skins are then centrifuged and dried in the drum with the sawdust.

The mink skins are usually run in the natural state without any additional dyeing. There are, however, some skins that are dyed using oxidized dyes. The skins are placed in vats and are dyed with the oxidizing dyes in the oval vats, after which they are removed and hung in the air to develop the color. The composition of the solutions and the processes for development of the color in mink is considered highly confidential information and suppliers and dyers would not share even the general nature of their formulae with one another.

The skins, either after dyeing or after dry drumming in the sawdust must be turned with the air out for drying and after the tannage they must be turned back to flesh out for the greasing. After tanning, the skins are

placed in the greasing drum. The skins are run for about 15 minutes to thoroughly coat the skins. The skins, covered with grease, are placed in the kicking machine and they are kicked for 15 to 45 minutes for the physical penetration of the grease into the fibers of the skin. The kicking greases are a variation of oil of lanolin (partly oxidized) and are in essence oil tanning agents. Upon removal from the kicking machines the skins may be turned and drummed again with sawdust, caged, turned, and passed through the stretching machine.

After the greasing has been completed and the skins have been kicked in the greasing machine, they may also be put in the kicking machine with corn starch to help absorb the excess grease on the surface and work the grease into the skins. By stretching the legs over a pole the skins are constantly pulled and stretched longer rather than wider in order to get the maximum cutting area from the skins. The skins are fleshed and shaved as needed either with a beam knife or with the circular bladed fleshing machine. The skins are drummed both with the hair out and with the leather out and is treated with sawdust and solvent hydrocarbons. The process is repeated with additional greasing, stretching, sawdusting and fleshing to get the skins as light as possible and as stretched as much as possiole.

In finishing the skins are drummed in sawdust after which they are pulled first, stretched as needed, further restretched and treated with solvents and drumming and caging several times as needed. At the end of the process the skins are shaxen

thoroughly by hand for the removal of the excess materials.

Upon completion of the dressing process, the mink skins are then placed into lots by individual bales by the inspection of the bale numbers that are placed on the skins at the original time. An accounting is made and the skins are again sent back to the owners for further processing into garments.

CONCLUSIONS

The world fur industry is undergoing great changes. The trapping of wild animals is decreasing due to the scarcity of some species and the decrease of wilderness areas. Better furs can be obtained through ranching methods employing selective breeding and proper feeding. The development of fur ranching has resulted in large volumes of trade in mink, karakul and fox skins.

The processing of skins is a specialized tanners art. With the decrease in the import duties on dressed skins in most of the advanced nations, more dressing of furs can be done in the emerging nations provided proper technical skills are developed.

If an emerging nation has proper climate and food supply for the raising of fur species of a particular type, the prospects for the development should be promising. Recent market trends have shown an increased interest in less expensive furs. This should open up new markets for furs produced in the emerging nations.

BIBLIOGRAPHY

The Blue Book of Fur Farming, Editorial Service Co., Milwaukee, Wisconsin, 1966

Organization for Economic Cooperation and Development, United Nations, January - December 1970

Food and Agriculture Industries: Karakul Processing, United Nations Development Programme

A Summary of Information on Furs, United States Department of Commerce, Revised 1968

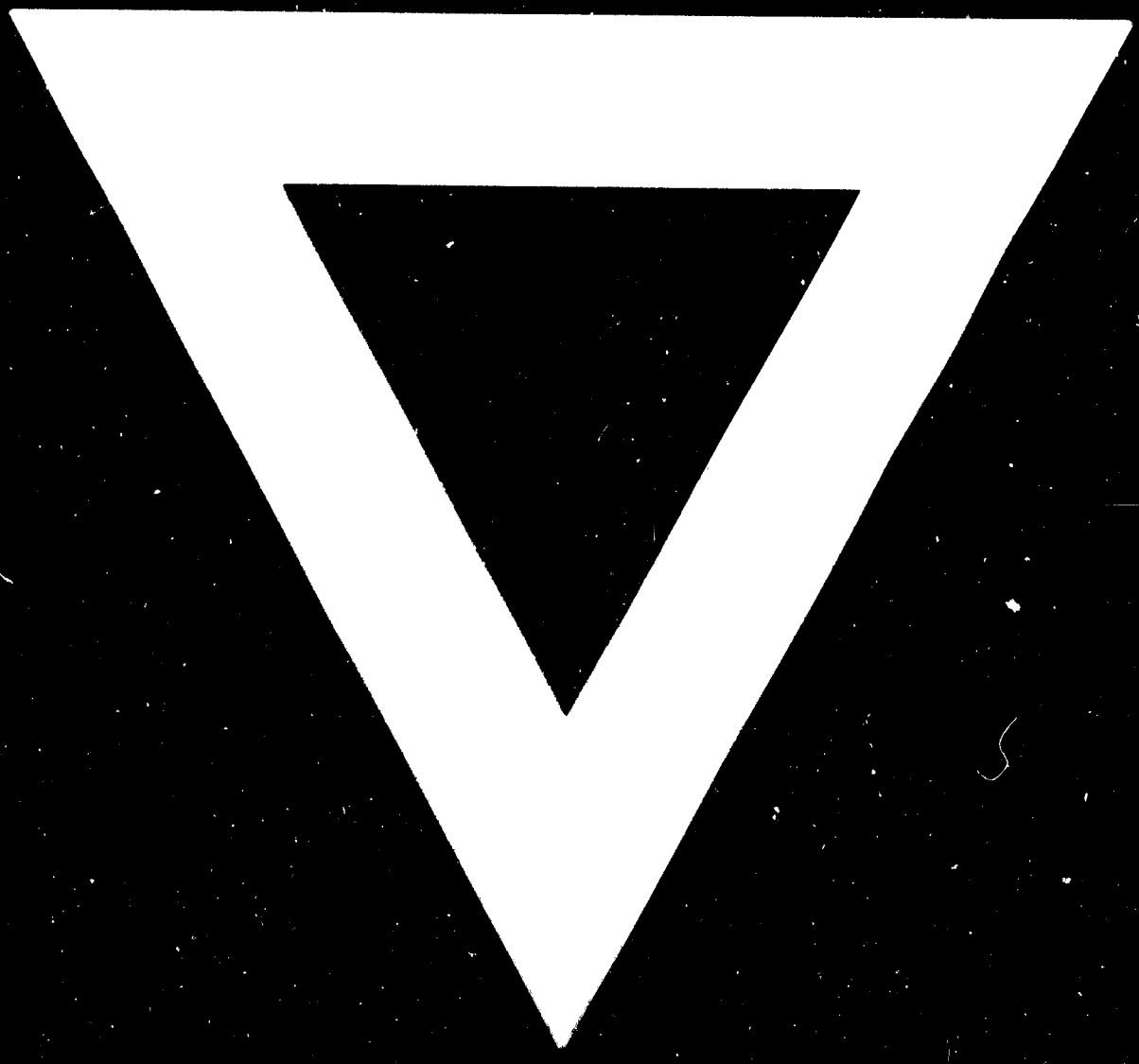
Fur Facts and Figures, United States Department of Commerce, Business and Defense Services, January 1966

The Fur Industry Abroad, United States Department of Commerce, Business and Defense Services, July 1969

United States Foreign Trade in Raw Furs, United States Department of Commerce, Consumer Products Division, April 1972

United States Imports for Consumption, United States Department of Commerce, U. S. Exports, 1971

Wildlife Leaflet 499, United States Department of Interior, December 1971



75. 11. 19