



COLORS AND PATTERNS -

AN INTRODUCTION TO--

COLOR AND PATTERN IN THE PEDIGREED CAT





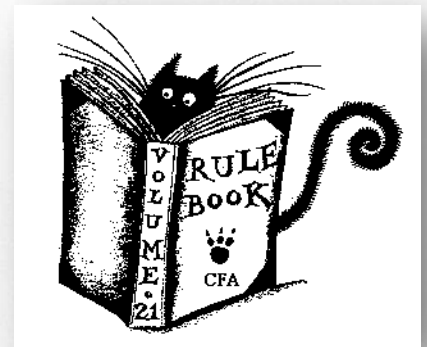
By Patricia Jacobberger

Copyright 2020 © The Cat Fanciers' Association, Inc., Alliance, OH, USA

All rights reserved including the right of reproduction in whole or in part in any form. No reproduction of the contents of this publication can be made without written permission.

INTRODUCTION

- **Purpose of today's presentation**
 - Acquaint you with the **basics** of colors and patterns and the associated genetics
 - Enable you to identify the common patterns/colors found in the pedigreed cat
 - Point out opportunities for further learning
 - **Learn and have fun!!**



CFA BREED STANDARDS

- Basis of all discussions around the descriptions of colors and patterns - the final authority today and during judging.
- Two issues to acknowledge regarding the descriptions of colors and patterns:
 - Many contradictions
 - Many incongruities

START WITH THE BASICS

- Our cats have descended from the African Wild Cat – Felis Silvestris Lybica.
- FSL is a Brown McTabby patterned cat.
- Mutations resulted in the variety of colors and patterns that we see in our cats today.
- Mutations result from:
 - Imperfect replication or joining of the components of the DNA molecule
 - Chemical imbalance within the body
 - Mutagens – nicotine and thalidomide
 - Greatest of all mutagen is **radiation**
 - Solar radiation, cosmic rays and Earth's background radiation
- Not all Mutations support survival.

START WITH THE BASICS

Felis Silvestris Lybica and the Seven Ancient Mutations



- Long Hair
- Blotched/Classic Tabby
- Solid Color/Non-Agouti
- Dominant/Epistatic White
- White Spotting
- Sex-Linked Orange or Red
- Dilution

WHAT IS A PATTERN?

- Decoration
- Design
- Scheme
- Stencil
- _____
- _____

Template – a Model that can be used repeatedly.

WHAT IS A PATTERN?

PATTERN GROUPINGS

- Solid Color
- Shaded
- Tabby
- Parti-color
- Bi-Color
- Albino Series

EYE COLOR



- **Dependent on selective breeding**
- **Exceptions:**
 - Burmese
 - Tonkinese - all patterns
 - Siamese/Pointed/Himalayan Pattern
 - Blue-eyed white Albino

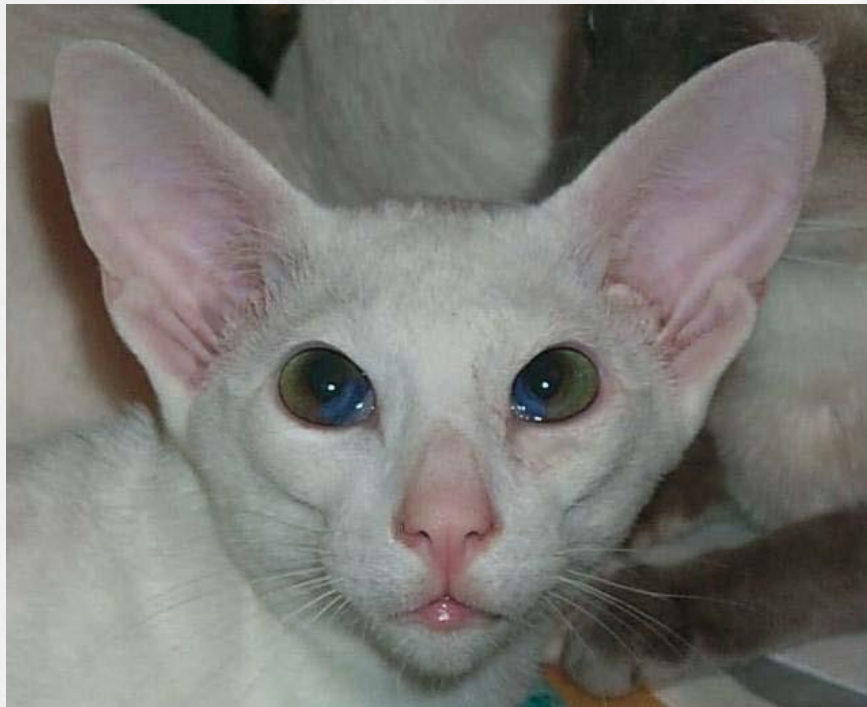
EYE COLOR



Heterochromia of the eye (*heterochromia iridis* or *heterochromia iridum*)

- *Complete heterochromia* - one iris is a different color from the other.
- The “odd-eyed” cat

EYE COLOR



- *Partial heterochromia* or *sectoral heterochromia*, part of one iris is a different color from its remainder.



SOLID COLOR



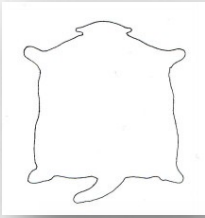
Black and White Persian Cats - The Book of the Cat by Frances Simpson; 1903

SOLID COLORS

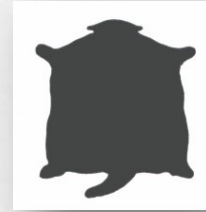
SOLID COLOR—A solid colored, or self-colored cat, is one whose coat is one color.

- No tabby markings
- No white lockets
- No startling change between the tip of the hair and where it exits the skin.

SOLID COLORS



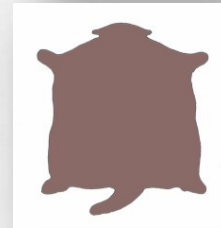
White



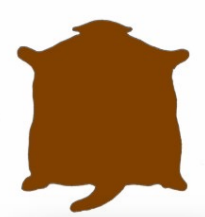
Blue



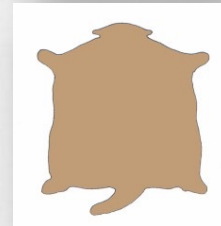
Black



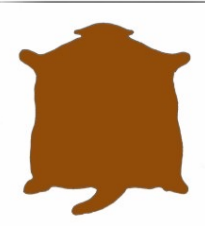
Lavender/Lilac



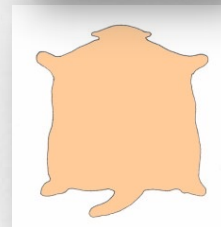
Chocolate



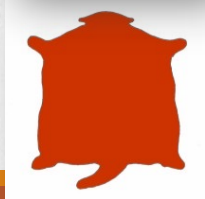
Fawn



Cinnamon



Cream



Red

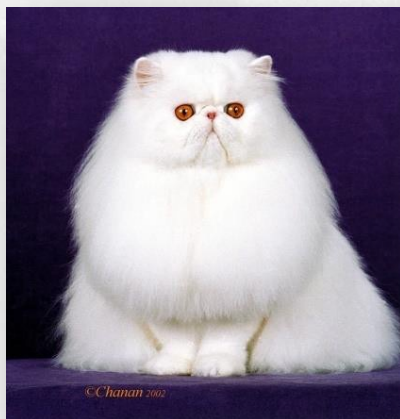
SOLID COLOR



Colors specific to the Norwegian Forest Cat

- Amber
- Light Amber - dilute of Amber

SOLID COLOR



SHADED AND SMOKE

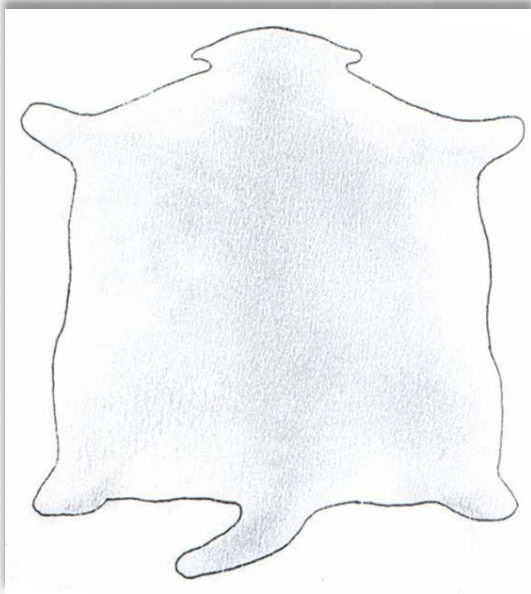




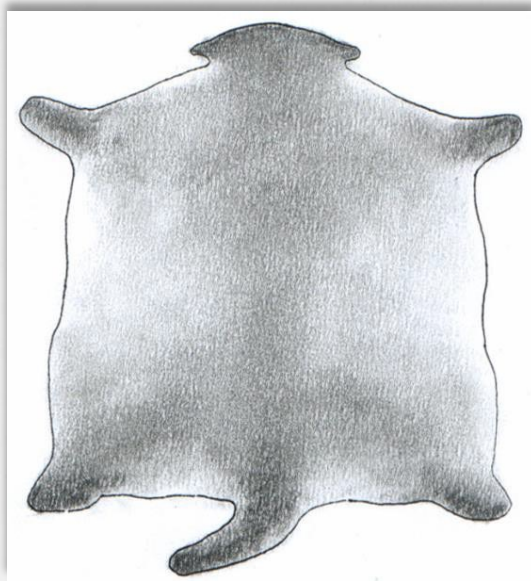
Chinchilla Cat - The Book of the Cat by Frances Simpson; 1903

SHADED AND SMOKE

What's the difference?!



Chinchilla



Shaded



Smoke

SHADED AND SMOKE

What's the difference?!



Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

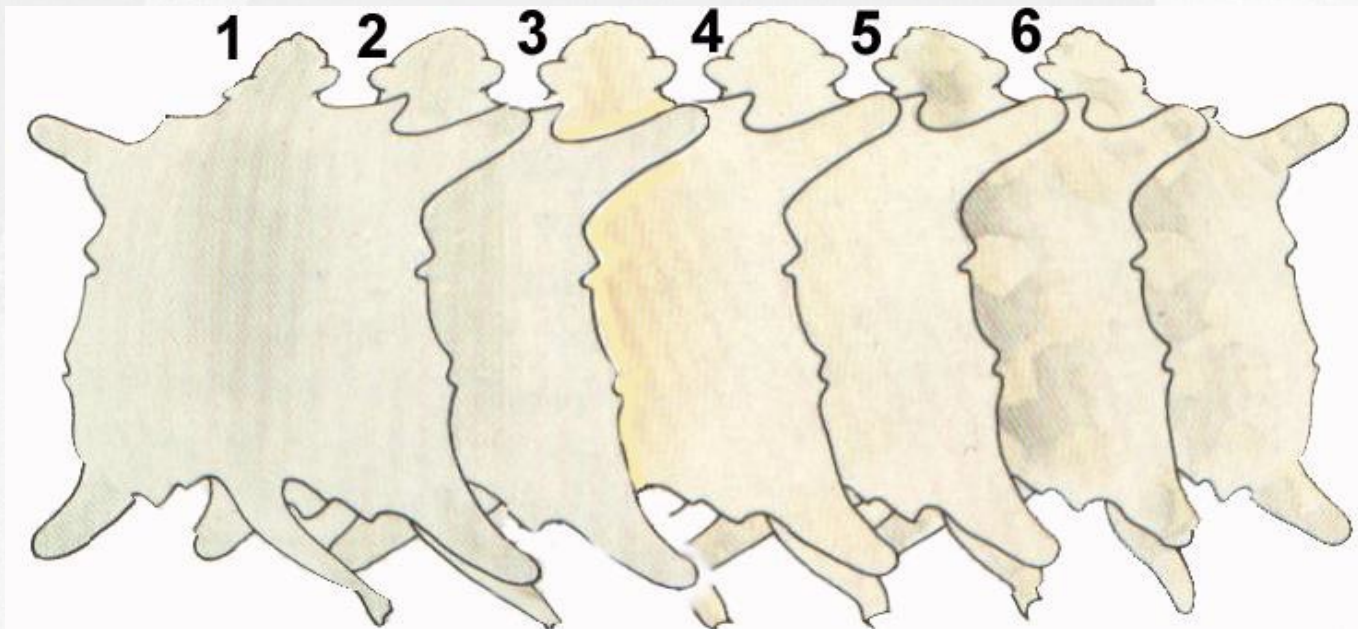
SHADED AND SMOKE

Chinchilla or Shell Pattern

- The heaviest expression of the melanin inhibitor gene.
- All the color is at the very tip (the last one-eighth) of the guard hair and may be of any recognized solid color, tortoiseshell or dilute tortoiseshell pattern of that breed.
- The undercoat is pure white.
- The coat on the back, flanks, head, and tail is sufficiently tipped with color so that you can see that the exhibit is not a white cat.
- The legs may be slightly shaded with tipping but the chin, ear tufts, stomach and chest are pure white.

SHADED AND SMOKE

Chinchilla/Shell



Shaded Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

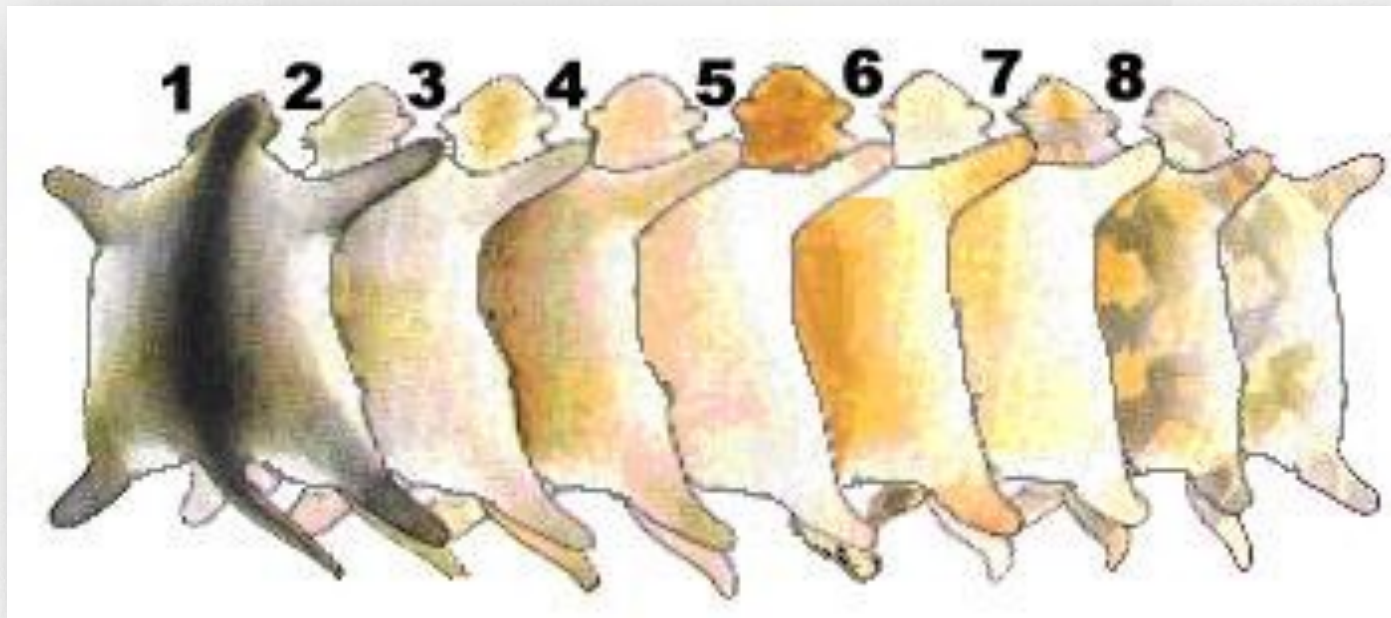
SHADED AND SMOKE

Shaded Pattern

- The moderate expression of the melanin inhibitor gene.
- All the color is at the last quarter of the guard hair and may be of any recognized solid color, tortoiseshell or dilute tortoiseshell pattern of that breed.
- The general effect is much darker than the chinchilla pattern.
- The undercoat is white.
- There is a mantle of colored tipping shading down from the sides, face, and tail from dark on the spine to white on the chin, chest, stomach, and under the tail.
- The legs are the same tone as the face.

SHADED AND SMOKE

Shaded



Shaded Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

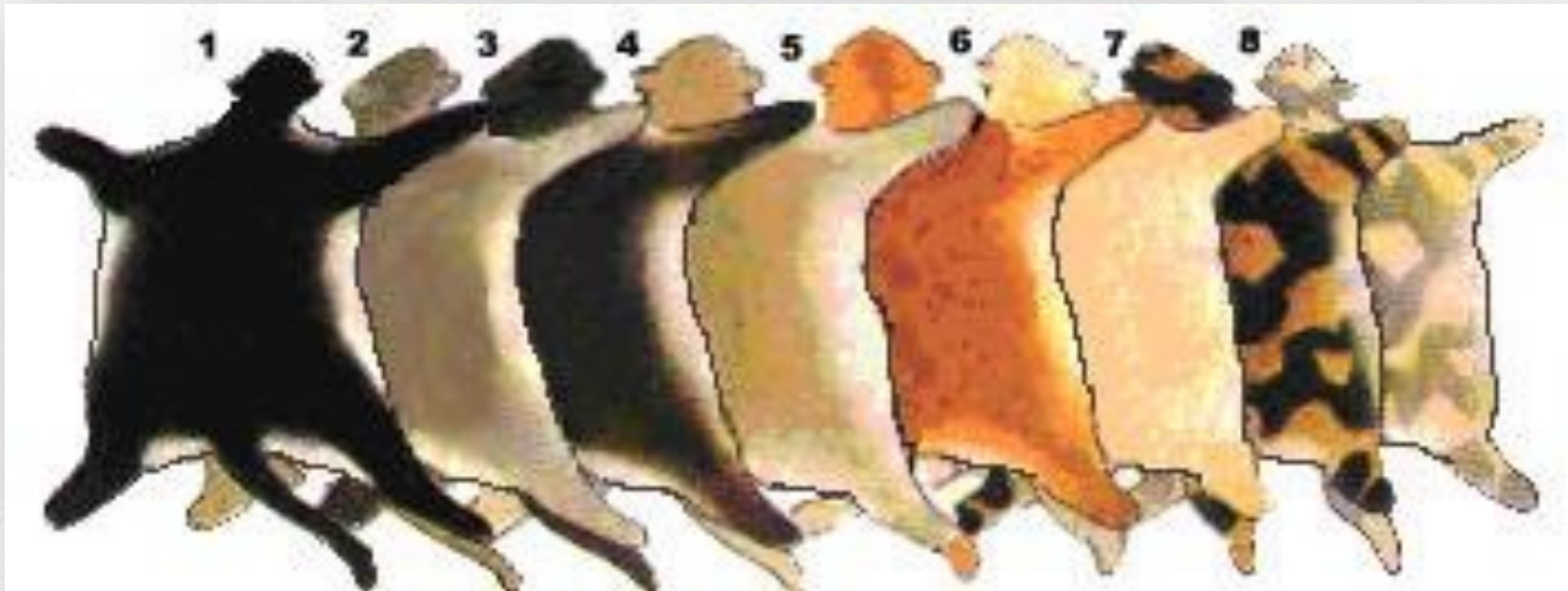
SHADED AND SMOKE

Smoke Pattern

- The lightest expression of the melanin inhibitor gene.
- All the color is on the last half of the guard hair and may be of any recognized solid color, tortoiseshell or dilute tortoiseshell pattern of that breed.
- The effect is that when the cat is in repose, it appears to be a solid color.
- When the cat is in motion or when you pull the coat backwards, the white undercoat is clearly, and dramatically, apparent.

SHADED AND SMOKE

Smoke



Shaded Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

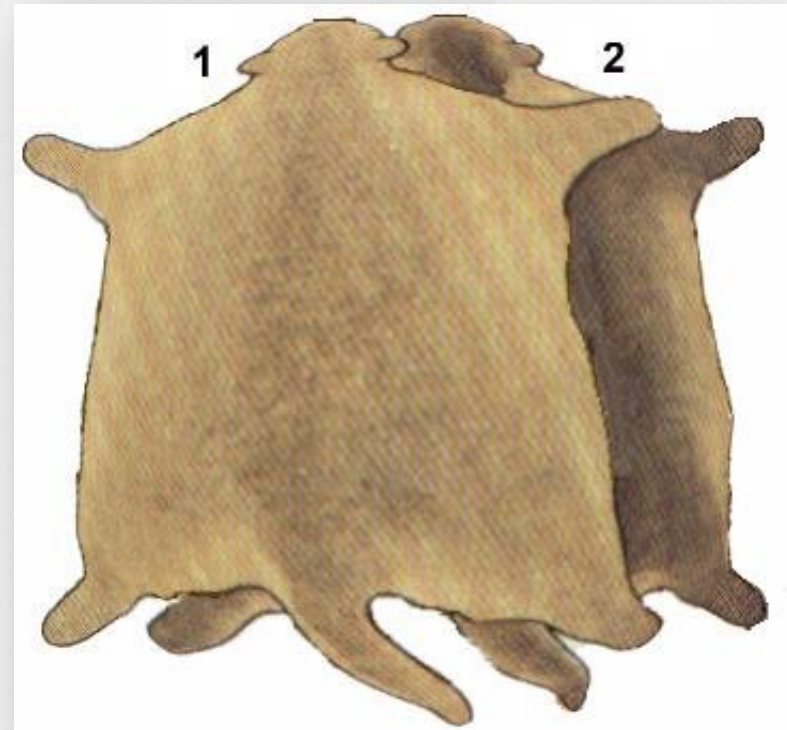
SHADED AND SMOKE

Goldens

- The patterns in the golden group are the same as the chinchilla and shaded patterns.
- However, the undercoat is a rich, warm cream rather than white.
- Years of selective breeding have altered the undercoat polygenes.
- This is what produces the striking warm-gold color of the undercoat.

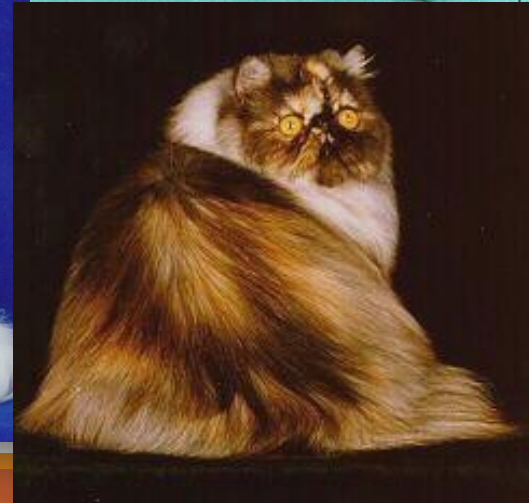
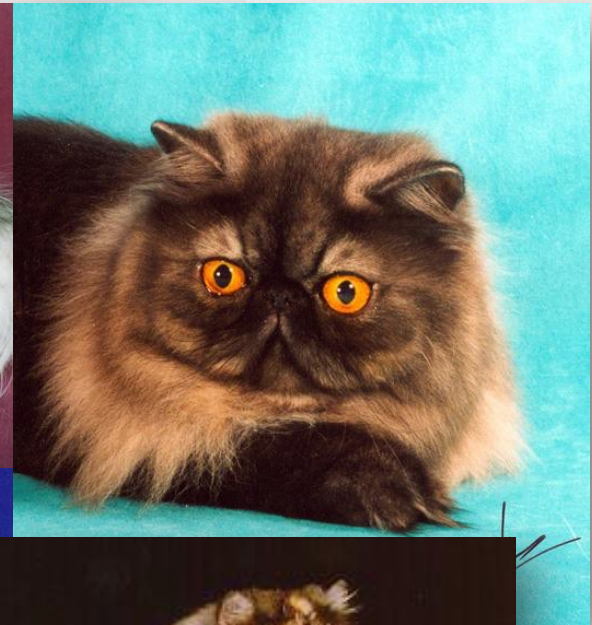
SHADED AND SMOKE

Goldens



Shaded Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

SHADED AND SMOKE



TABBY PATTERNS



Brown Tabby and Orange Tabby SH Cats- The Book of the Cat by Frances Simpson; 1903

TABBY PATTERNS

**Mackerel
Tabby**



TABBY PATTERNS

Mackerel Tabby

- The wild-type” tabby pattern.
- The markings are dense, clearly defined, and all narrow pencilings.
- The legs are evenly barred with narrow **bracelets** coming up to meet the body markings.
- The tail is barred with **tail rings**.
- The **necklaces** on neck and chest are distinct, like so many chains.
- The head is barred with an “M” **on the forehead**.
- Unbroken lines are running back from the eyes.
- Lines are running down the head to meet the shoulders.
- The **spine lines** run together to form a narrow saddle.
- Narrow pencilings run around body.”

TABBY PATTERNS

Classic Tabby



TABBY PATTERNS

Classic Tabby

- The markings are dense, clearly defined, and broad.
- The legs evenly barred with **bracelets** coming up to meet the body markings.
- The tail is evenly ringed.
- There are several unbroken **necklaces** on the neck and upper chest, the more the better.
- The frown marks on forehead form an intricate letter “M.”
- An unbroken line runs back from outer corner of eye.
- There are **swirls** on the cheeks.
- Vertical lines over the back of the head and extend to the shoulder markings which are in the shape of a **butterfly** with both upper and lower wings distinctly outlined and marked with dots inside the outline.
- The back markings consist of a vertical line that runs down the **spine** from the butterfly to the tail with a vertical stripe paralleling it on each side.
- The three stripes are well separated by stripes of the ground color.
- There is a large solid blotch on each side of the body that is to be encircled by one or more unbroken rings. The side markings should be the same on both sides.
- There is a double vertical row of **buttons** on chest and stomach.”

TABBY PATTERNS

**Spotted
Tabby**



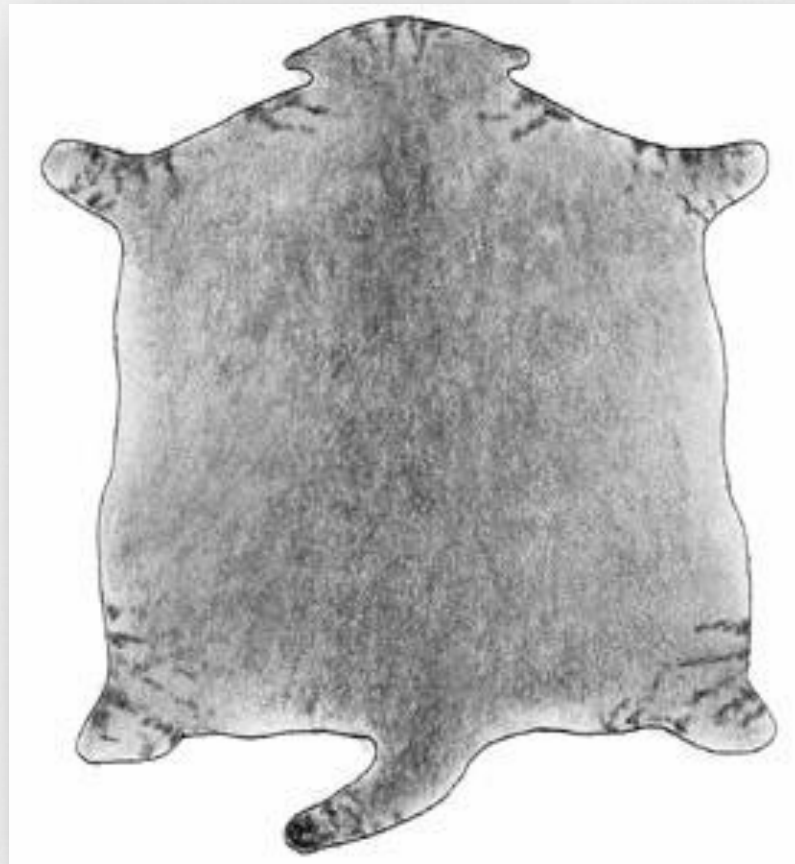
TABBY PATTERNS

Spotted Tabby

- The pattern is not uniform in this variation.
- The markings on the body are to be **spotted**. They may vary in size and shape with a preference given to **round, evenly distributed spots**.
- The spots should not run together in a broken mackerel pattern.
- A dorsal stripe runs the length of the body to the tip of the tail. The stripe is ideally composed of spots.
- The markings on the face and forehead shall be typically tabby markings.
- The underside of the body is to have "vest buttons."
- The legs and tail are barred."

TABBY PATTERNS

**Ticked
Tabby**



TABBY PATTERNS

Ticked Tabby

- The body hairs are to be ticked with various shades of marking color and ground color.
- The body, when viewed from the top is to be free from noticeable spots, stripes, or blotches, except for darker dorsal shading.
- The lighter underside may show tabby markings.
- The face, legs, and tail must show distinct tabby striping.
- The cat must have at least one distinct necklace.

TABBY PATTERNS

Rosetted/Spotted Tabby



TABBY PATTERNS

Rosetted/Spotted Tabby

- Rosettes and spots shall be random, with a horizontal flow to their alignment, and a pattern like no other breed.
- Ground color should be clear, and free of ticking.
- Contrast with ground color must be extreme, showing distinct pattern with sharp edges.
- Rosettes are two toned, with dark outlines, and a lighter center.
- Rosettes can be many different shapes, such as round donut, open donut, pancake, paw print, arrowhead, or clustered, and are preferred to single spotting.
- Strong, bold chin strap and mascara markings desirable.”

TABBY PATTERNS

Marble Tabby



TABBY PATTERNS

Marble Tabby

- The pattern is full of swirls, with a pattern like no other breed.
- Ground color should be clear, and free of ticking.
- Contrast with ground color must be extreme, showing distinct markings with sharp edges.
- Markings are two toned, having a horizontal or diagonal flow. Side pattern symmetry not required.
- There should be no resemblance to the Classic Tabby pattern, and a circular pattern or bullseye is undesirable. The more random the pattern, the better.
- Additional color tones inside the pattern, giving a “stained glass” effect is desirable.
- Patterned shoulder markings, and multi-toned markings on legs and tail desirable.
- Rosettes and spots can be present, particularly on the legs.
- Strong chin strap, mascara markings desirable.
- Backs of ears have a thumbprint.
- Color on chest and belly should be lighter than ground color. Belly must be patterned.”

TABBY PATTERNS

Patched



TABBY PATTERNS

Patched Tabby

- An established Classic, Mackerel, Spotted or Ticked Tabby in blue, brown, chocolate, chestnut, cinnamon, ebony, fawn, lavender, lilac, silver or blue silver, with patches of red or softly intermingled areas of red on both body and extremities (presence of several shades of red acceptable.
- Dilute colors exhibit cream instead of red).”

TABBY PATTERNS

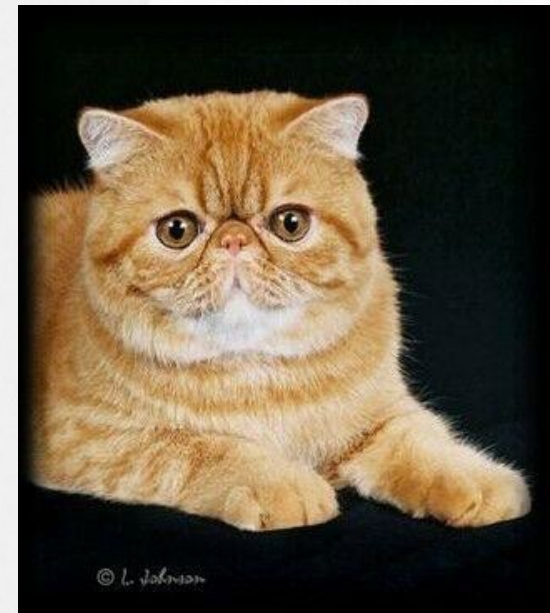
Common Elements in Tabby Patterns

- **Ground color** - the background color (agouti) of the tabby pattern. The color and contrast vary depending on the color. The expectation is that the ground color offers significant contrast to the tabby markings.
- **Tabby markings** - the swirls, stripes, pencilings of the pattern. These markings are expected to be one color and very dense.
- **Spine line** - the stripe(s) running down the back or the spine of the cat.
- **Mascara markings/lines** - facial tabby markings, particularly around the eyes but including cheek markings or swirls.
- **Bracelets** - the tabby markings that encircle the legs.
- **Necklaces** - the tabby markings at the throat.
- **Tail Rings** - the markings on the tail.
- **Buttons** - on the belly
- **The Tabby “M”** - the characteristic marking on the forehead of every tabby patterned cat.

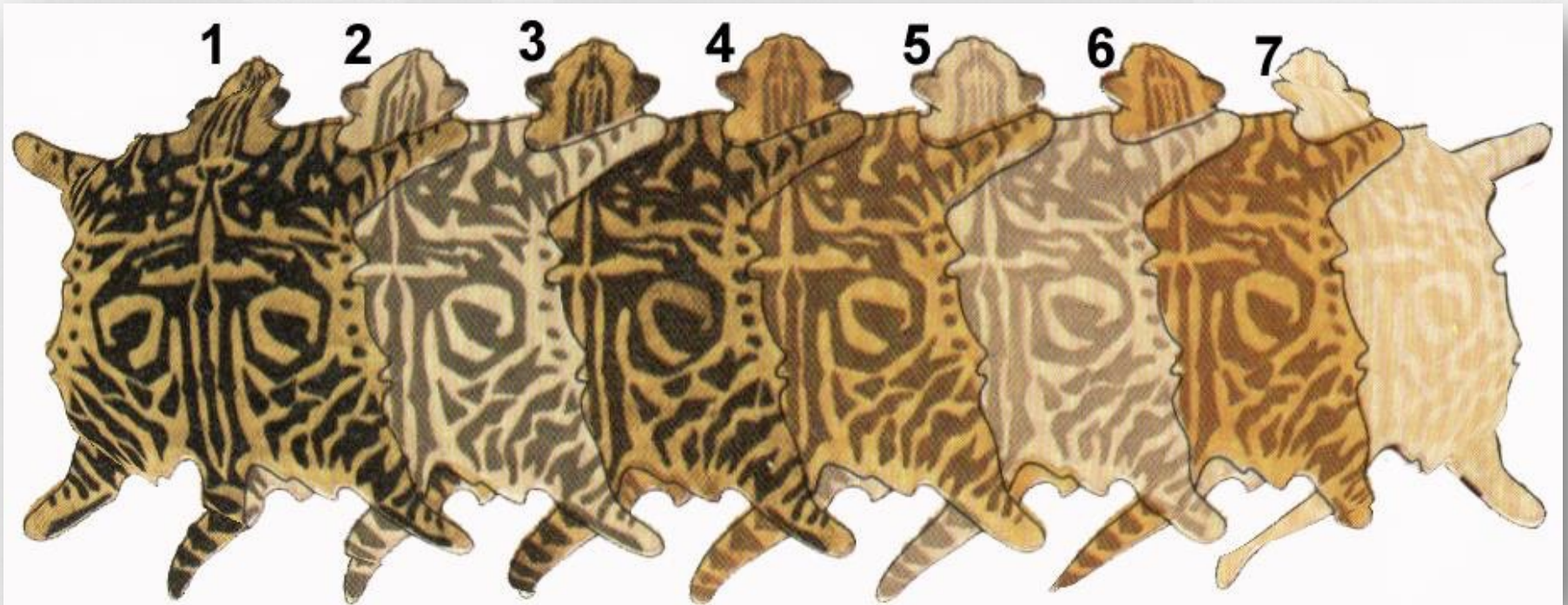
TABBY PATTERNS

Agouti Cats . . . Not bi-colors

All Tabby Patterns

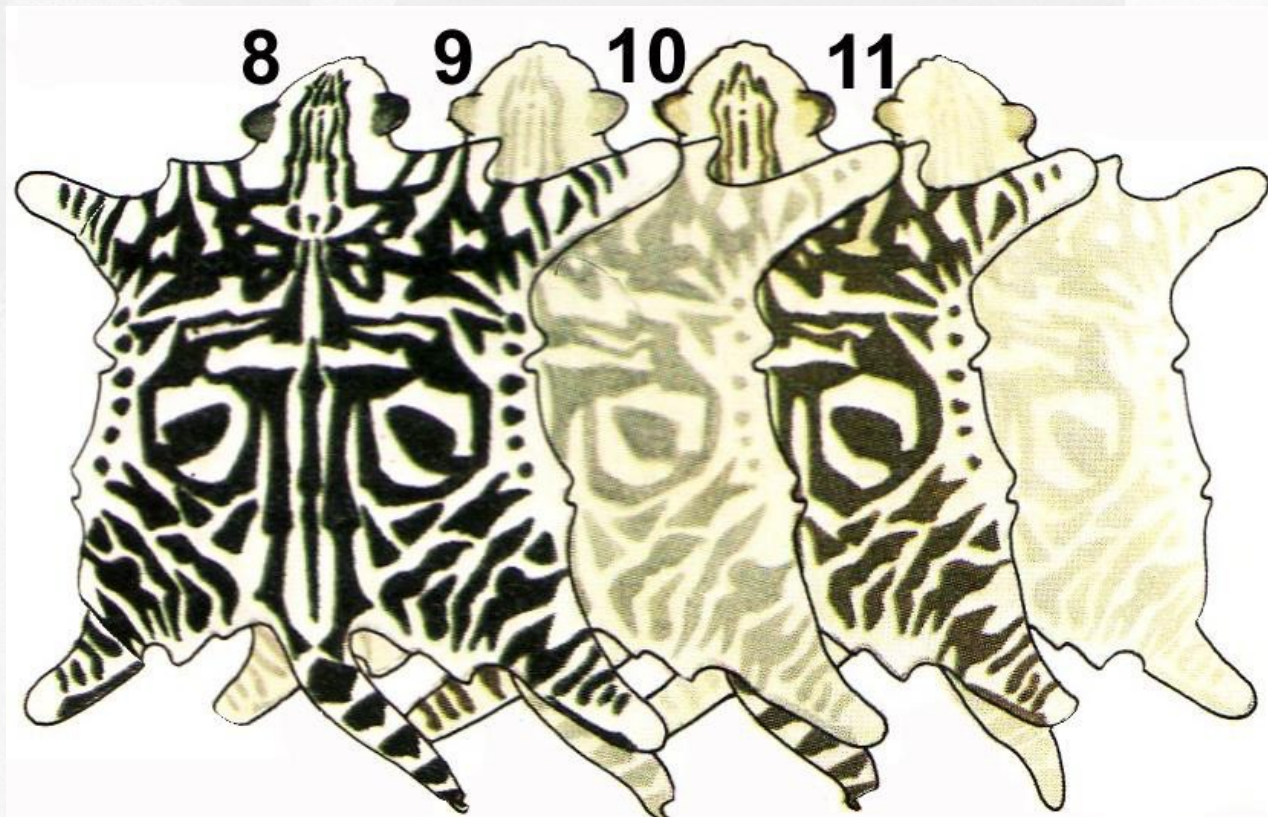


TABBY COLORS



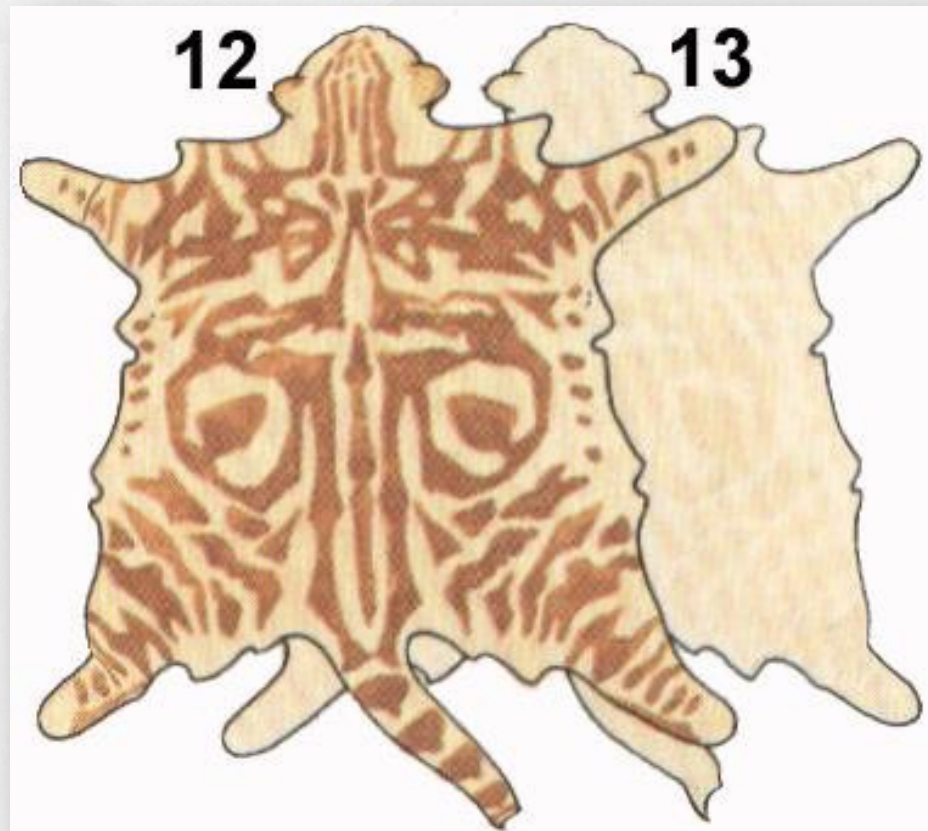
Tabby Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

TABBY COLORS



Tabby Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

TABBY COLORS



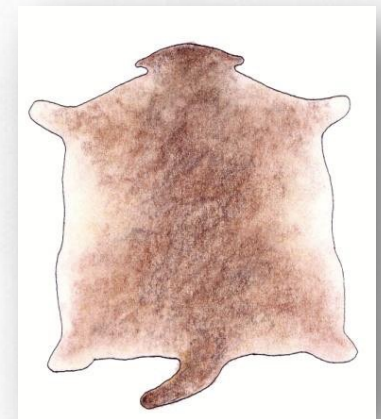
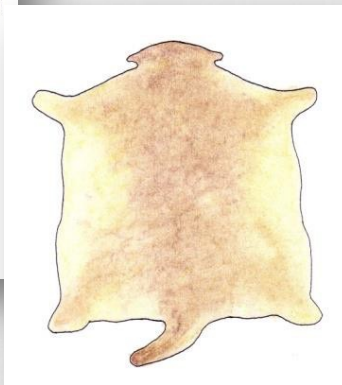
Tabby Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

TABBY COLORS



Tabby Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

TABBY COLORS



Abyssinian Colors

Singapura

TABBY COLORS



Amber and Light Amber Tabby in the NFC

TABBY PATTERNS



TABBY PATTERNS



PARTI COLORS



Tortoiseshell and Tortoiseshell and White Persians - The Book of the Cat by Frances Simpson; 1903

PARTI COLORS

Tortoiseshell Pattern



PARTI COLORS

Tortoiseshell Pattern

- The archetypal tortoiseshell is a black female cat with random patches of red.
- If you look carefully at the red areas, you will see evidence of the red tabby pattern. This has given rise to the popular belief that the tortoiseshell colored coat is comprised of three colors - black, red and cream.
- In fact, what looks like cream is the ground color of the red tabby pattern.
- Many of our standards have been changed to reflect the more correct definition of the tortoiseshell pattern.

PARTI COLORS

1



2



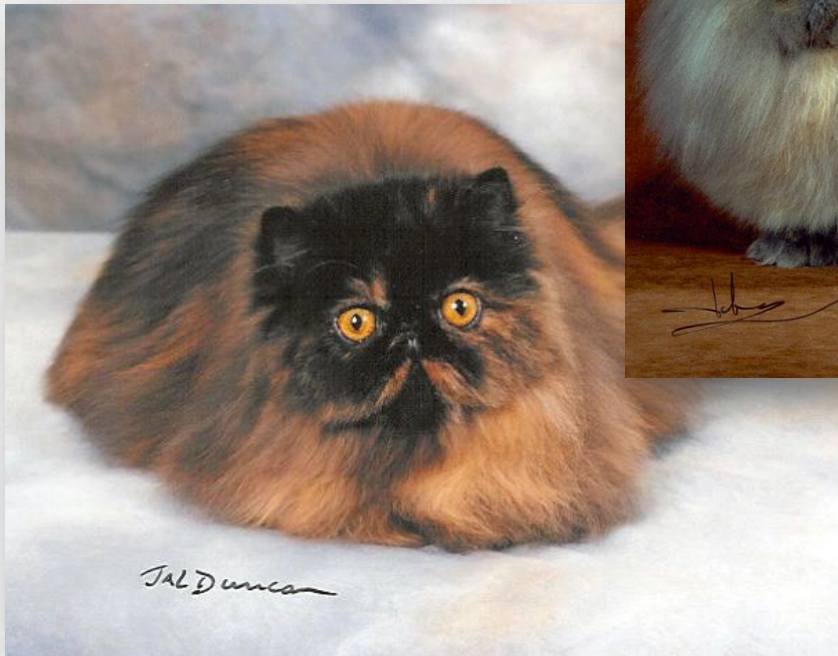
3



4



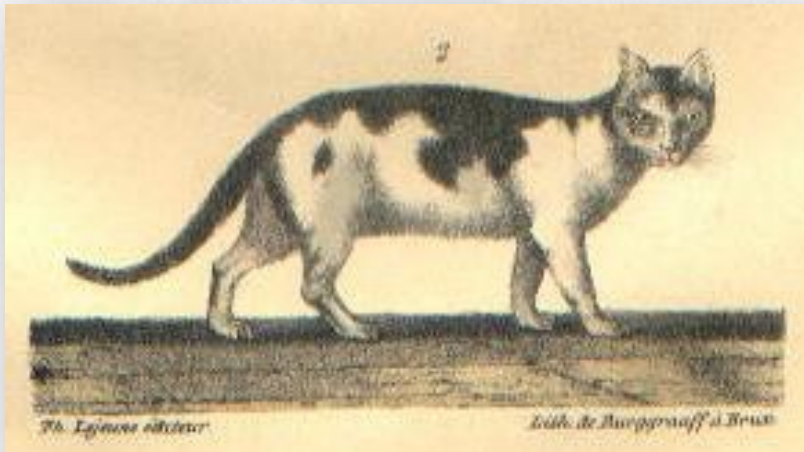
PARTI COLORS



PARTI COLORS



BI-COLORS AND CATS WITH WHITE



Bi-Color and Calico Cats - By George Louis LeClerc Buffon

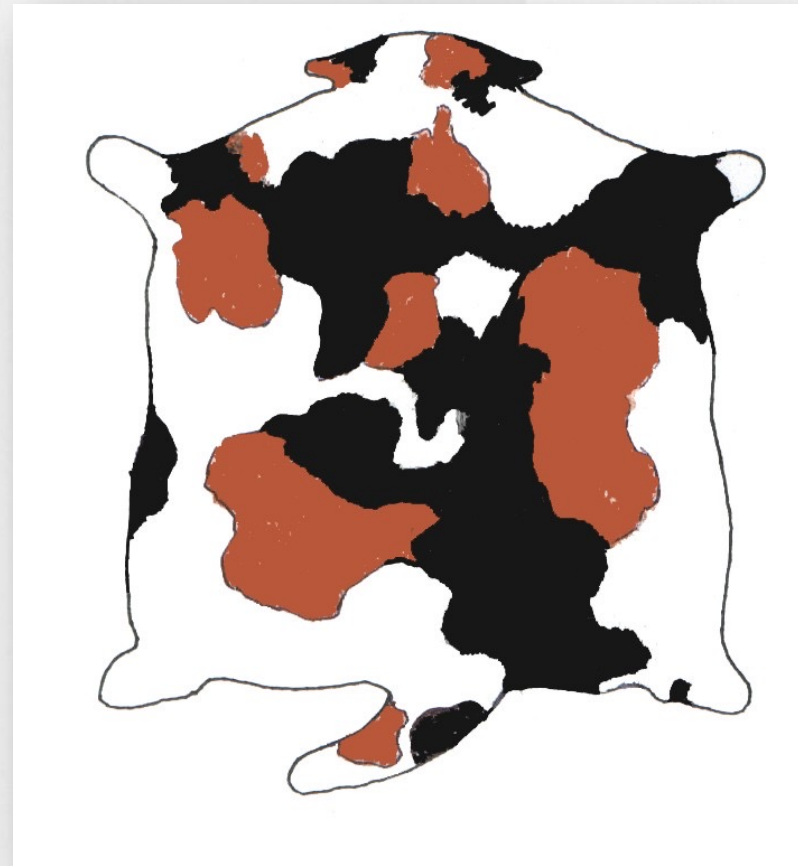
from Oeuvres Completes de Buffon, Volume III, 1833

BI-COLORS AND CATS WITH WHITE



BI-COLORS AND CATS WITH WHITE

Calico



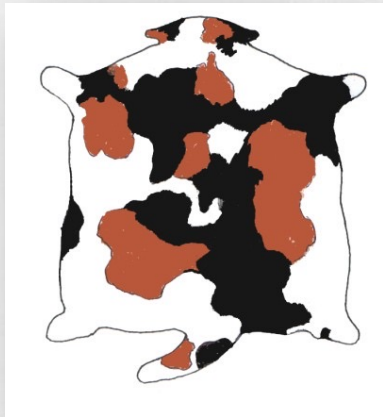
BI-COLORS AND CATS WITH WHITE

Calico

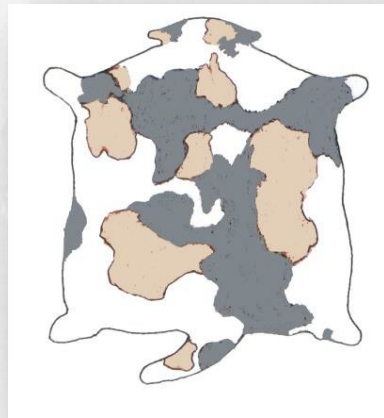
- A pattern related to the sex-linked red gene that is generally included in the bi-color group in most breeds.
- A calico cat is a red and black female cat with solid areas of white. In the *Japanese Bobtail*, the calico pattern is termed **Mi-Ke**—the equivalent to calico in Japanese.
- **Calico** - “a tri-color cat of black, red and white.
- The red and the black should appear as clear, unbrindled patches.
- As a preferred minimum, the cat should have white feet, legs, undersides, chest and muzzle.
- Less white than this minimum should be proportionately penalized but there are several standards specific to given breeds.

BI-COLORS AND CATS WITH WHITE

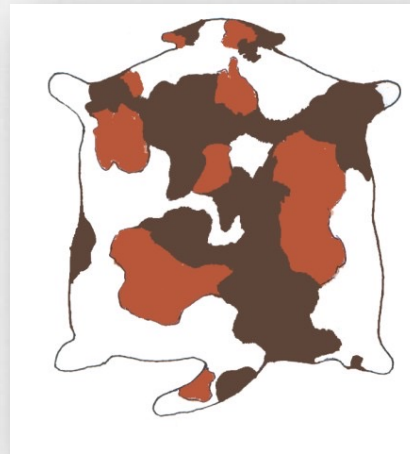
1



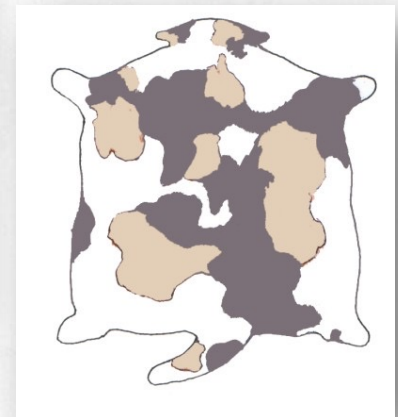
2



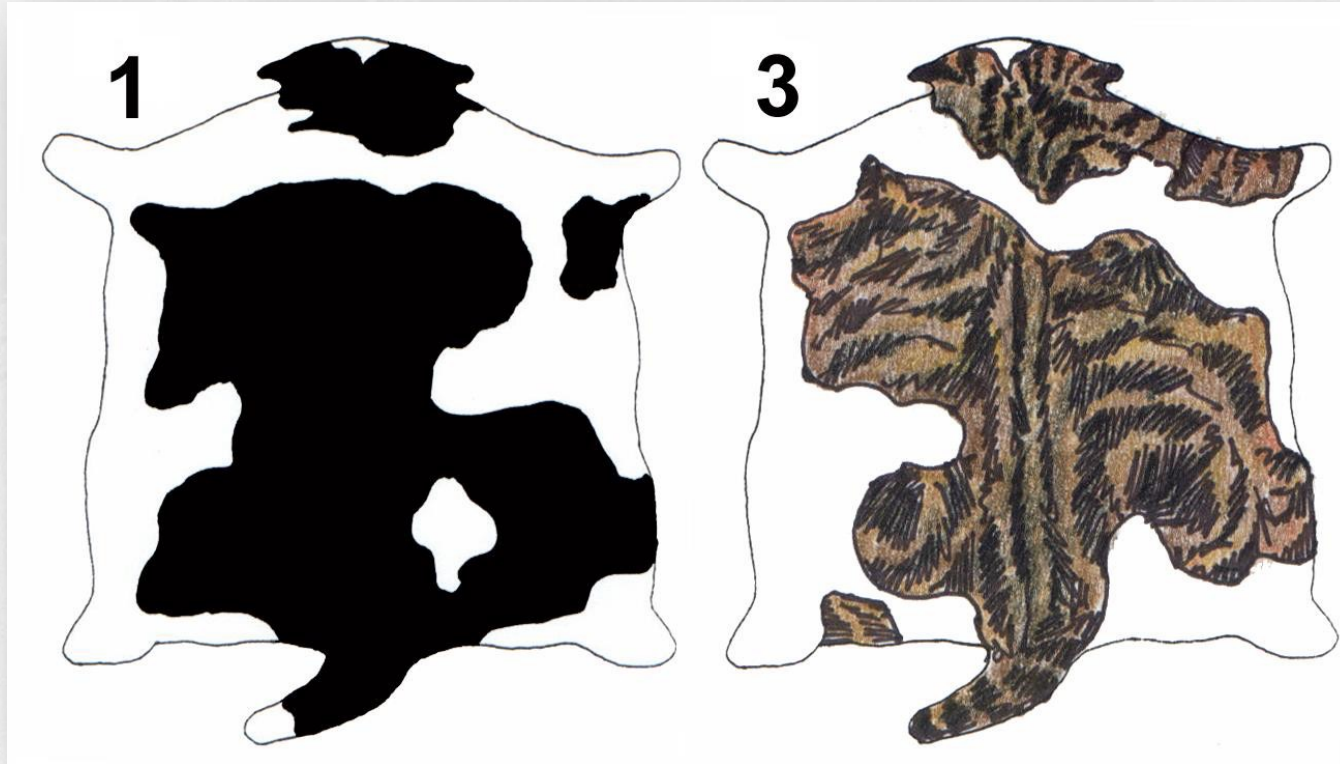
3



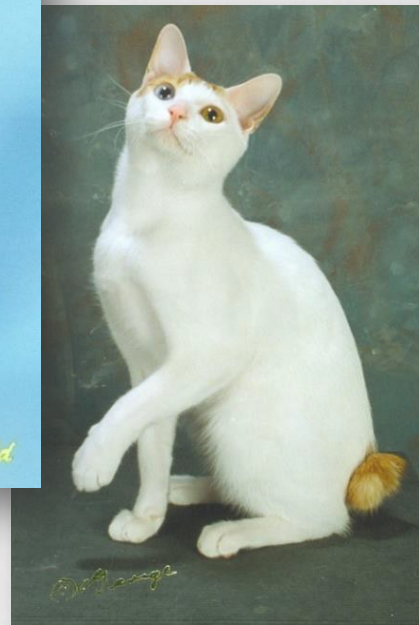
4



BI-COLORS AND CATS WITH WHITE



BI-COLORS AND CATS WITH WHITE



BI-COLORS AND CATS WITH WHITE



Karpati-variations



From The Messy Beast

www.messybeast.com

PATTERNS OF THE ALBINO SERIES



From the Tamra Maew as shown in The Legend of the Siamese Cats by Martin R. Clutterbuck, 1998



BLACK MANX AND ROYAL SIAMESE CATS.

(From a Painting by W. Fisher, Jun.)

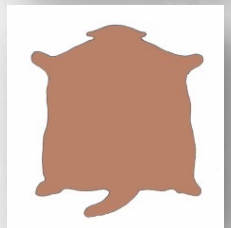
THE ALBINISM GENE

- There are 5 alleles for this gene.
 - “C” results in full color, dominant gene
 - “c^b” Burmese gene
 - “c^s” Siamese gene
 - “c^a” blue-eyed albino
 - “c” true albino
- Dominance: $C > c^b = c^s > c^a > c$
- c^bc^s mink pattern of the Tonkinese and other breeds with gene pools containing Siamese and Burmese genes.
- Temperature sensitive genes

PATTERNS OF THE ALBINO SERIES



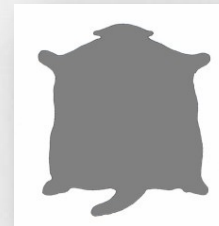
Sable/Brown/
Natural



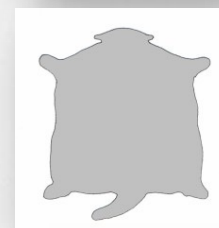
Champagne/
Chocolate



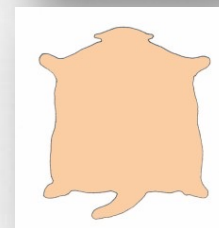
Red



Blue



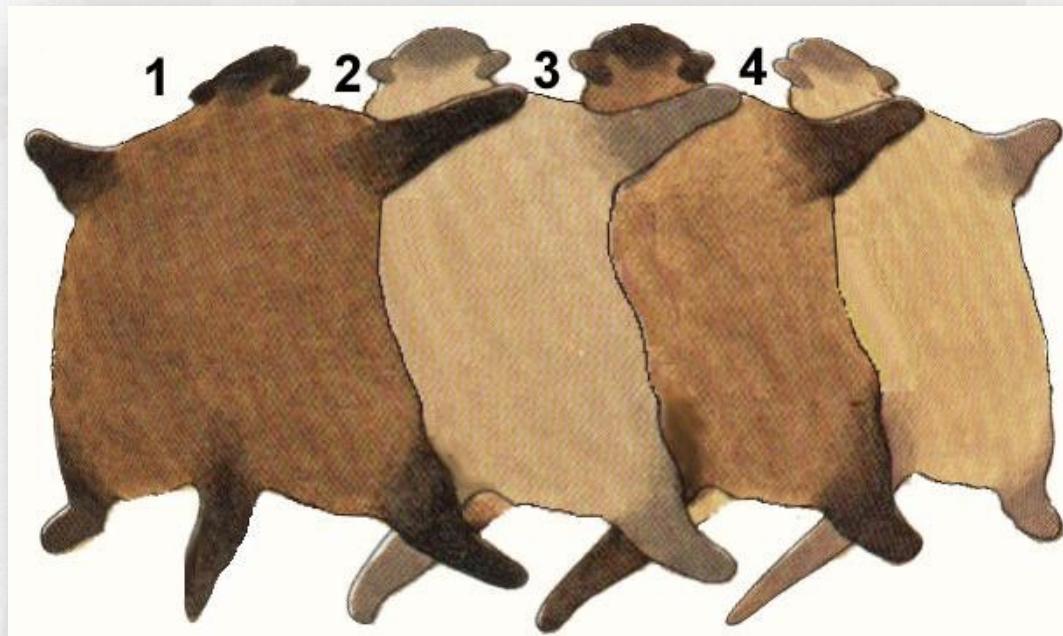
Platinum/Lilac



Cream

Burmese/Sepia Pattern

PATTERNS OF THE ALBINO SERIES

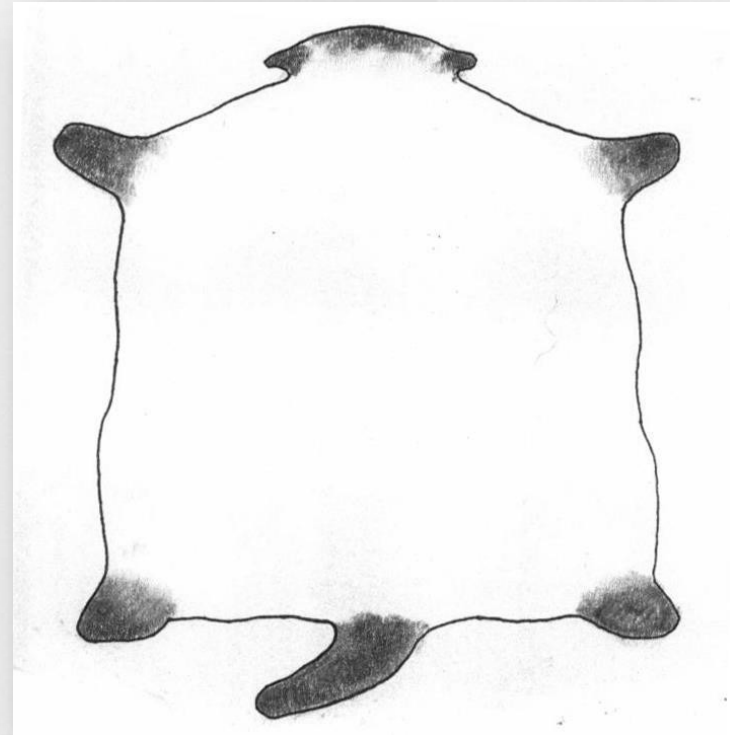


Mink Pattern

Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

PATTERNS OF THE ALBINO SERIES

Colorpoint
Pointed
Himalayan
Siamese



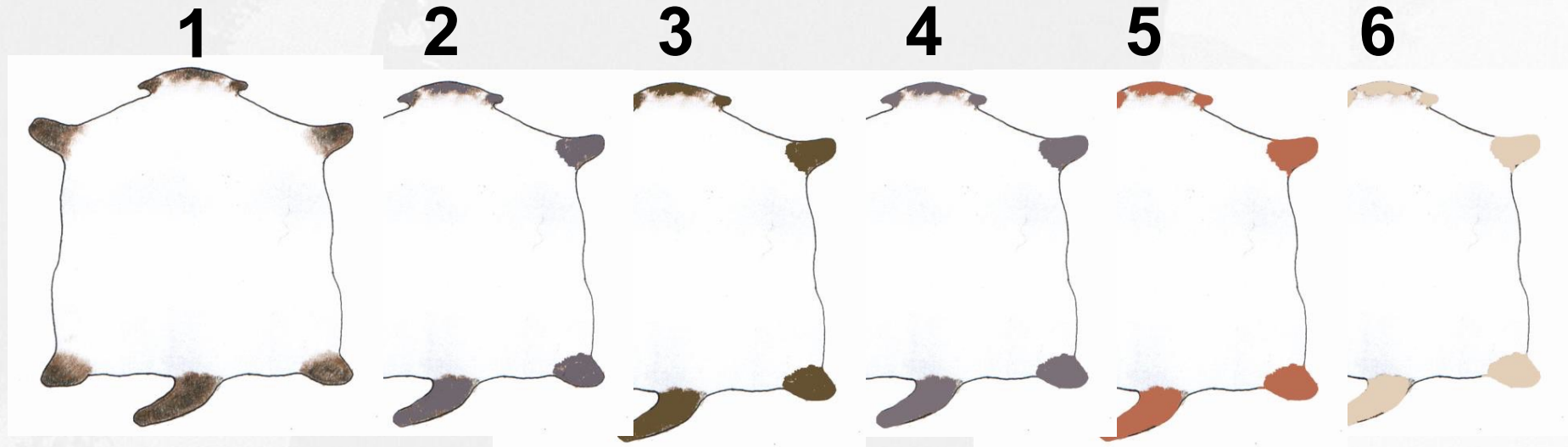
PATTERNS OF THE ALBINO SERIES

Colorpoint/Pointed/Himalayan/ Siamese Pattern

- Body color is even, with subtle shading when allowed. Allowance should be made for darker color in older cats as pointed pattern cats generally darken with age. There must be a definite contrast between the body color and points.
- The points - face mask, ears, legs, feet, and tail - are dense and clearly defined and are all the same shade.
- The face mask covers the entire face including the whisker pads and is connected to the ears by tracings.
- The face mask should not extend over the top of the head.
- There should be no ticking or white hairs in the points” except as allowed (e.g., ticked tabby point and white bi-color).

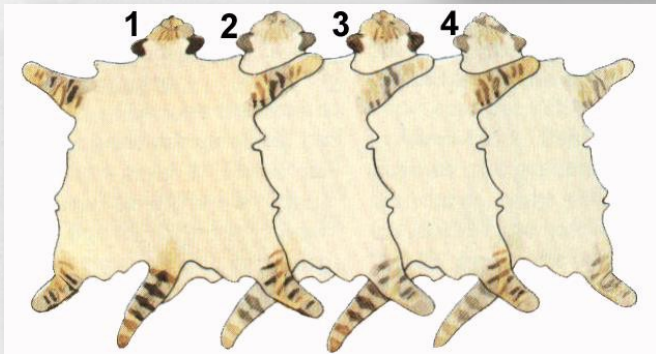
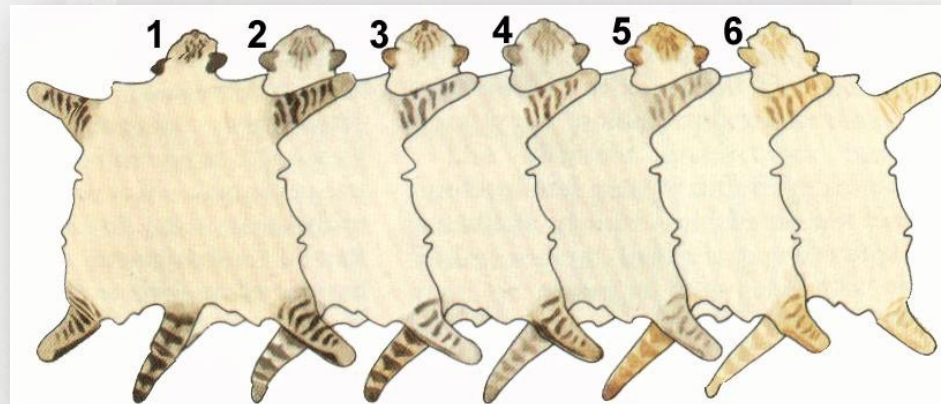
PATTERNS OF THE ALBINO SERIES

Solid



PATTERNS OF THE ALBINO SERIES

Lynx



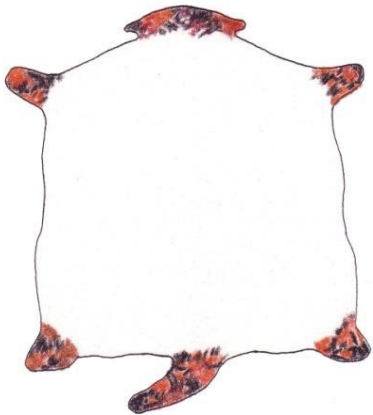
Patched Lynx

Pointed Pattern Colors - Adapted from The Book of the Cat by Michael Wright and Sally Walters, 1980

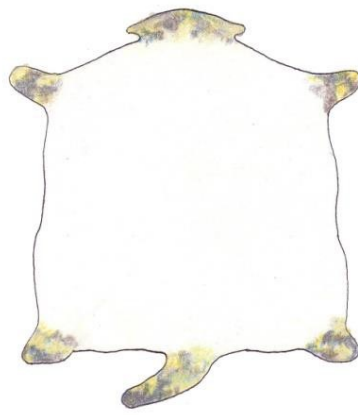
PATTERNS OF THE ALBINO SERIES

Partis

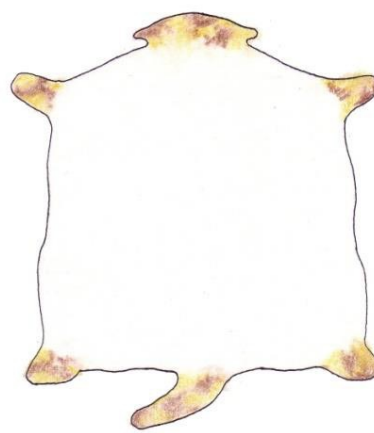
1



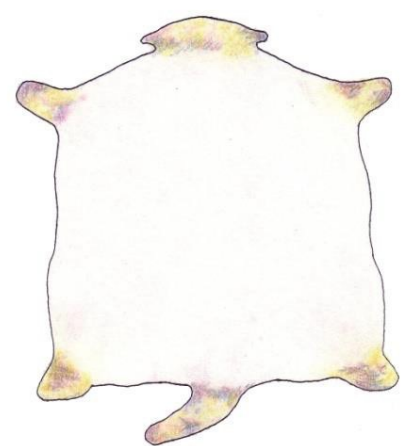
2



3

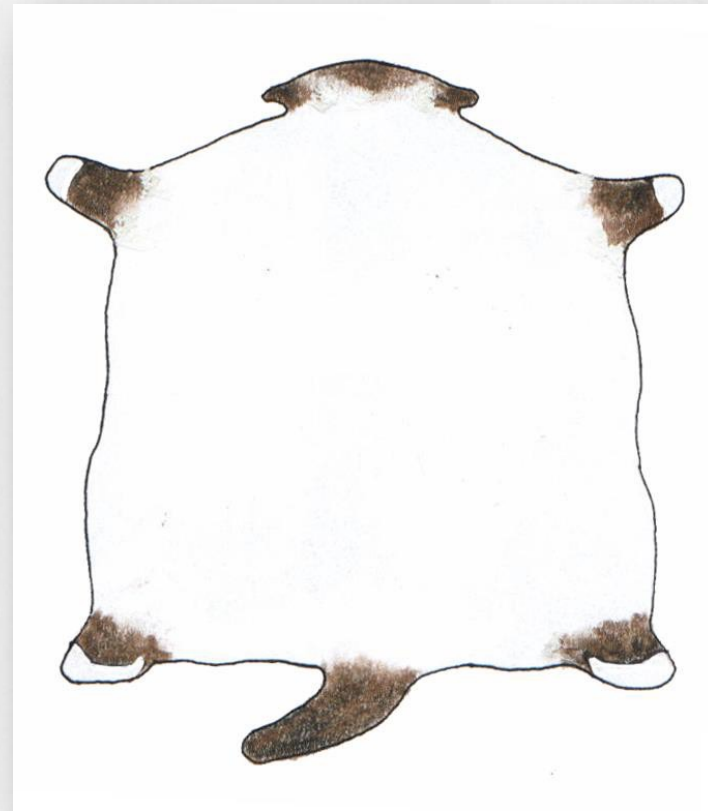


4



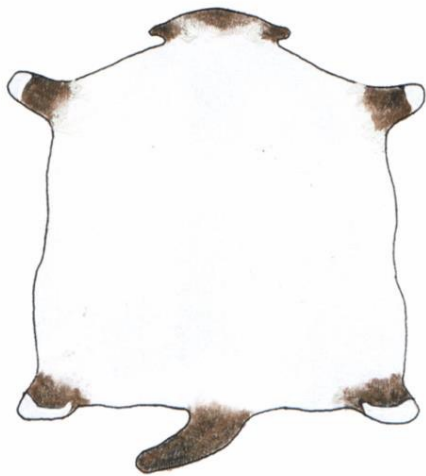
PATTERNS OF THE ALBINO SERIES

**Birman
Pattern**



PATTERNS OF THE ALBINO SERIES

1



2



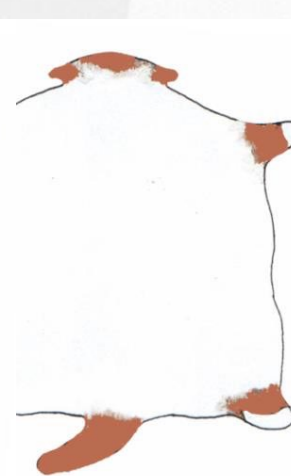
3



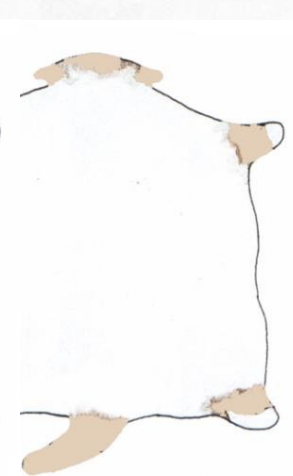
4



5



6



PATTERNS OF THE ALBINO SERIES

**Tabby
Patterning on
Colorpoints**



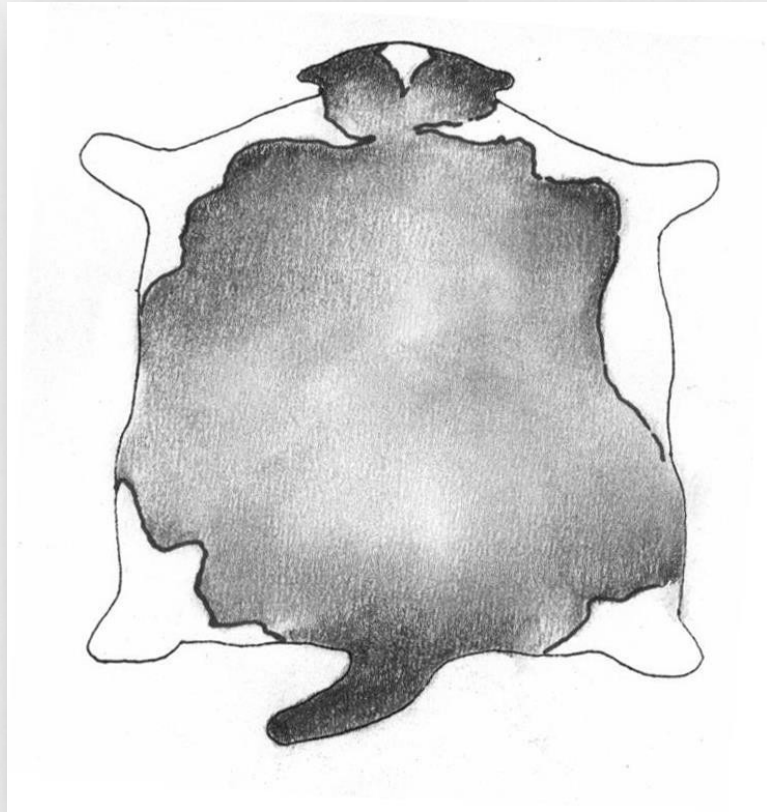
PATTERNS OF THE ALBINO SERIES

Patterning is seen in the pointed examples of many breeds:

- American Bobtail, American Curl, Siberian to name a few.
- There are several reasons for this:
 - Underneath it all, all cats are tabbies, and it is hard to camouflage that pattern genetically.
 - Breeders of those breeds where it is allowed are generally not breeding for the pointed pattern per se, so they do not develop breeding programs to "improve" the patterning to eventually breed it out of the gene pool.
- In fact, some breeds standards state this is preferred because the patterning on the pointed cats gives a feral appearance - an example, the American Bobtail
- Breeds standards like the Siamese, Balinese, CPSH, etc., have a significant number of points on pattern. So much so that, the pattern is explicitly spelled out in their standards and it is integral to every breeder's program.

PATTERNS OF THE ALBINO SERIES

**The Ragdoll/
Pointed Bi-Color
Pattern**



PATTERNS OF THE ALBINO SERIES



Dilute Burmese

PATTERNS OF THE ALBINO SERIES



Used with permission of Chamsey's Cattery.

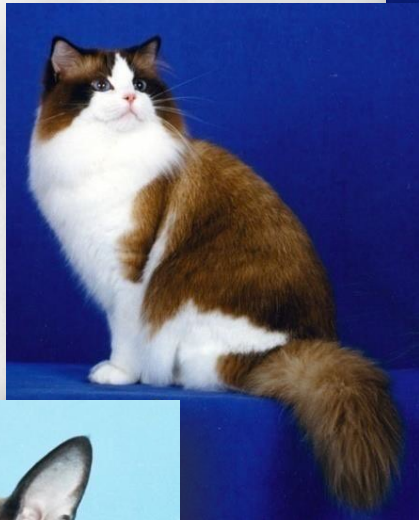
European Burmese

PATTERNS OF THE ALBINO SERIES



Tonkinese

PATTERNS OF THE ALBINO SERIES



OH MY! WHAT NEXT?!



2023 edits by Vicki Nye