

SECTION IV

FABRIC DAMAGE

DAMAGE TO FABRIC—CHEMICAL DAMAGE

ACID DAMAGE (HYDROCELLULOSE)

Why does this occur? Hydrocellulose is produced when cellulose fibers such as cotton, linen, rayon, are reacted upon by acid. This chemical action produces a degraded cellulose. The reaction weakens the yarns, hence the fabric.

When does this occur? This type of damage may be caused in various ways. Items may come in contact with many everyday *acidic* substances that may be spilled on a fabric and allowed to dry. In time this weakens

the fabric. Normal flexing in drycleaning, wetcleaning or laundering may cause damage to the weakened areas.

How may this be prevented? Protection of clothing from acidic substances will prevent this type of damage. If an acidic substance comes in contact with the fabric, flush the area immediately with water. It is frequently impossible to detect the *exact* acid that caused the damage. However, damage can often be identified by chemical tests to determine the presence of hydrocellulose.

FIGURE 75

A Fehling's solution was used in NID laboratories to determine the cause of the horizontal slits. The copper color shows the presence of hydrocellulose (acid damage). (10)



ACID DAMAGE (HYDROCHLORIC)

Why does this occur? Hydrochloric acid is a strong mineral acid. It attacks and weakens most of the textile fibers. Even dilute concentrations will harm most fabrics.

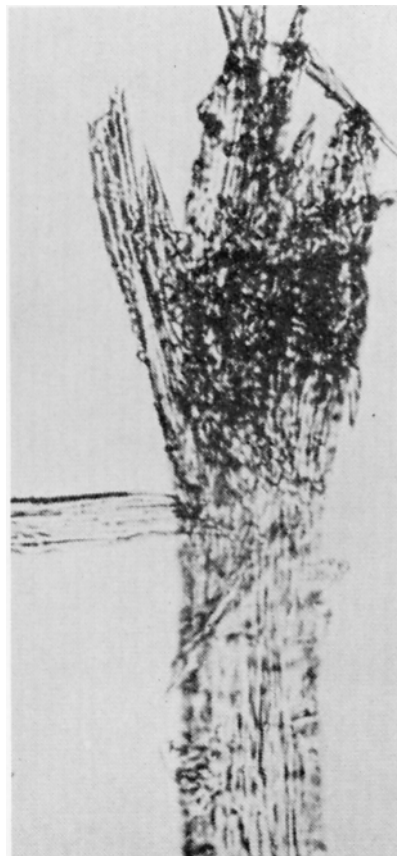
When does this occur? The damage usually results when a person brushes against an object on which acid has been spilled. Hydrochloric acid is used extensively in industrial plants and in dental, medical, photographic, and in all chemical laboratories. Hydrochloric acid, commonly called muriatic acid, is used in some medicines. Some scouring

compounds and deodorants will form hydrochloric acid under certain conditions of use and storage.

How may this be prevented? Care in wear is the only way to avoid this damage. Many times damage from hydrochloric acid is not evident until after the garment has been drycleaned, wetcleaned or laundered. The flexing of the fabric in drycleaning, and the heat of drying and pressing, cause the damaged areas to disintegrate. Hydrochloric acid is never used in any of the drycleaning operations.

FIGURE 76

Typical appearance of wool fiber damaged by acid as seen through a microscope. (11)



ACID DAMAGE (HYDROCHLORIC) BONDED WOOL

Why does this occur? Some shoulder pads and some jacket linings are made from wool fibers held together with a thin film of synthetic rubber containing chlorine. This is known as "bonded wool." Under certain conditions, the synthetic rubber breaks down and gives off hydrochloric acid strong enough to cause the lining fabric to weaken.

When does this occur? During wear, drycleaning, or storage, the fabric may be weakened to the point of disintegration by the acid liberated from the bonded wool. This occurs in the shoulder area near the shoulder pad. In a jacket lining, the damage may be localized or may be over the entire lined area.

How may this be controlled? Though this type of damage often shows up during drycleaning, its cause must be attributed to the presence of chlorine-containing synthetic rubber. This type of damage may be controlled by selection of a binder that does not contain chlorine in the manufacture of bonded wool.

(Reference: NID Technical Bulletin T-258; Fabrics-Fashions Bulletin FF-29)

FIGURE 77

Wool fibers bound together by the use of synthetic rubber may also be used as interlining in coats and jackets. Under certain conditions the synthetic rubber gives off hydrochloric acid in sufficient quantity to cause fabric deterioration.

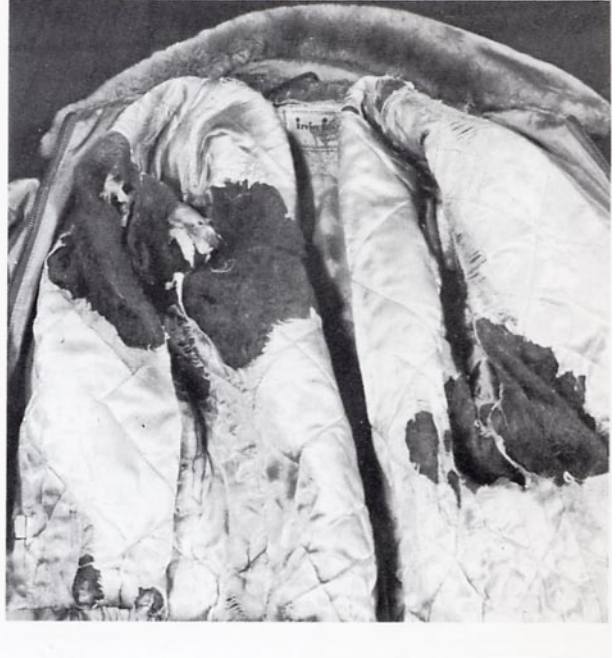


FIGURE 78

Under certain conditions, the synthetic rubber used to bind wool together in the making of shoulder pads breaks down and gives off hydrochloric acid. Often the acid is strong enough to cause fabric deterioration.

ACID DAMAGE (HYDROCHLORIC) FLOCKED SUEDE; FLOCKED VELVET

Why does this occur? Some simulated suede fabrics made by the flocked method are affected by light and time. It is often first noted after a period of storage. The adhesive binder that holds the flock to the base fabric is discolored by exposure to light. Areas that are protected, such as underneath a collar, the underside area of a sleeve, cuff or facing remain unaffected. This is how the original color can be determined. The exposed area becomes deeper and more intense in shade. The exposed areas are also affected by abrasion during wear and drycleaning. The breakdown of the adhesive allows the flock to abrade off readily. The exposed areas may also lose strength. Tests show affected areas are acid in reaction. Hydrochloric acid is formed by the decomposition of the synthetic rubber adhesive.

When does this occur? In many cases the sunlight damage is hidden by general soil from wear. When the garment is drycleaned and the soil is removed, the color change is noted. The normal agitation necessary to remove soil in drycleaning may also remove the flock in affected areas. The weakened fabric may also split in areas of strain, such as the caps of sleeves and shoulders.

How may this be remedied? Manufacturers have recognized that this problem may be eliminated by substituting an acrylic based binder for the synthetic rubber binder.

(References: NID Fabrics-Fashions Bulletins FF-58; FF-79.)



FIGURE 79
Areas of the garment that are exposed to light may change color. In some cases the flocking or nap is removed by abrasion in wear or drycleaning.

FIGURE 80

Loss of fabric strength may occur in areas exposed to light. Loss of strength is due to an acidic condition resulting from oxidation of the adhesive used to hold the flock to the base fabric.



FIGURE 81

Samples of flocked suede stored over a five year period showed color change, loss of flock, and fabric deterioration. The adhesive oxidized, resulting in an acid condition.

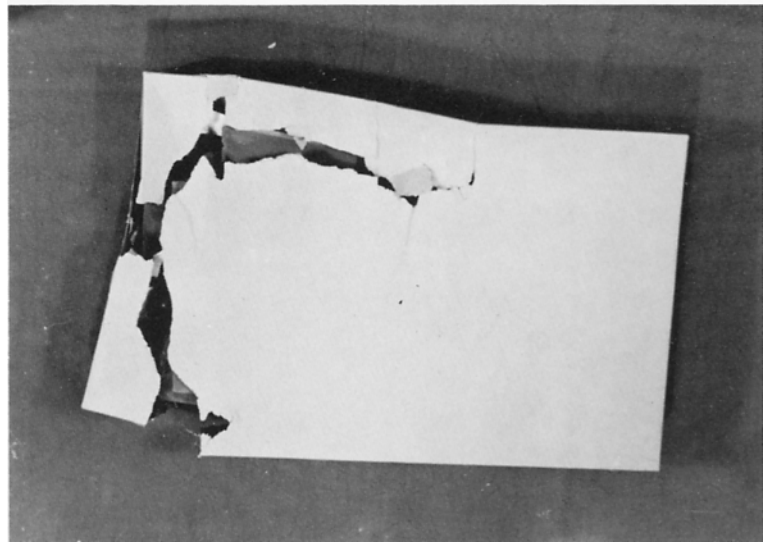


FIGURE 82

Acid damage from neoprene latex has caused fabric damage and the rusting of a steel pin and wire hanger.



ACID DAMAGE (SULFURIC)

Why does this occur? Sulfuric acid is a strong mineral acid. It attacks and weakens most textile fibers. Even dilute concentrations will harm most fabrics. Sometimes a dilute acid may be spilled on a fabric. As it dries the water evaporates and leaves a less volatile and more concentrated acid in the fabric.

When does this occur? Such damage usually results when a person brushes against an object on which acid has been spilled. Sulfuric acid is used extensively in industrial plants and in dental, medical, photographic, and all chemical laboratories. Storage batteries contain sulfuric acid. Accidental con-

tact with them is a common cause of this type of fabric damage. Some deodorants contain salts of sulfuric acid which can, under certain conditions, form sulfuric acid.

How may this be prevented? Care in wear is the only way to avoid this damage. Often damage from sulfuric acid is not evident until after a garment is drycleaned. The flexing of the fabric in drycleaning, wet-cleaning and laundering, and the heat of drying and pressing cause the damaged areas to disintegrate. Sulfuric acid is not used in any of the drycleaning operations.

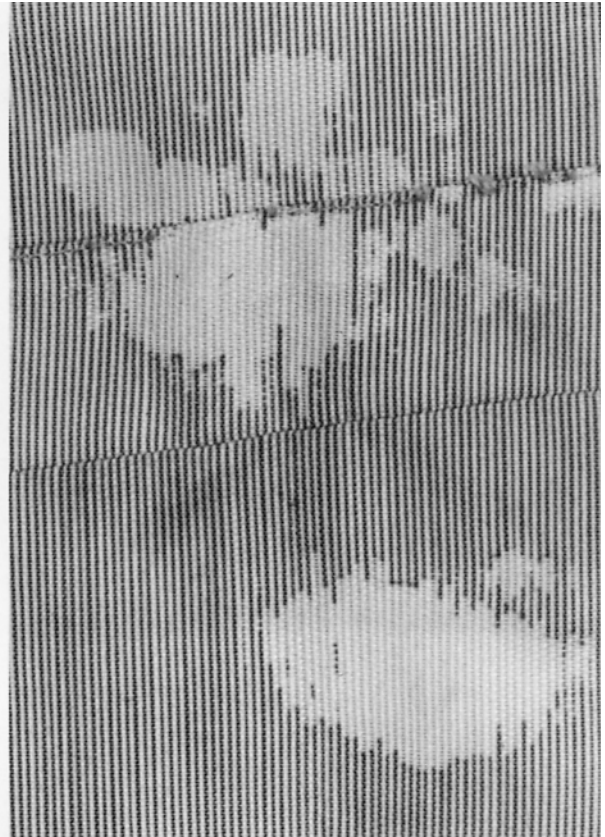
FIGURE 83

Sulfuric acid is a common source of fabric damage. This wool suiting fabric was damaged by sulfuric acid.



FIGURE 84

This Dacron and cotton suiting fabric was damaged by sulfuric acid.



ALKALI DAMAGE

Why does this occur? This type of damage is frequently found on wool fabrics, wool blends, and wool combinations. Wool is very sensitive to alkaline substances. Even dilute solutions of strong alkalis damage wool very readily. This type of damage may also occur on silk, hair fibers, and synthetic protein fibers.

When does this occur? The damage may occur when a wool fabric comes in contact with caustic soda, caustic potash, or strongly alkaline washing compounds. Caustic alkalis are used in many household cleaning

aids such as lye, Drano, floor scouring products. Many times the consumer is not aware that such substances have contacted wearing apparel or household items. Frequently the damage is not evident until the item has been subjected to the normal flexing action necessary to dryclean it.

How may this be prevented? Precaution in wear and use is the only way this type of damage may be avoided. If an alkaline substance comes in contact with the fabric, flush the area immediately with water.

FIGURE 85

Typical alkali damage to a wool fiber as viewed under $\times 500$ magnification. (11)



CHLORIDE DAMAGE TO SILK

Why does this occur? This type of damage occurs on silks, silk blends or combinations. Chloride salts, from various sources, react chemically with the silk yarns. A sufficient concentration of chloride salts in a fabric causes it to weaken and finally disintegrate.

When does this occur? Damage from chloride salts results from direct contact of the fabric with certain types of foodstuffs, beverages, medicines, perspiration, deodorants, metal

cleaning compounds, or salt water. The area affected becomes very weak upon the drying or aging of any of these substances in the fabric. The flexing action required to dry-clean the fabric is sufficient to cause the weakened areas to develop holes.

How may this be prevented? Protection of garments during wear from direct contact with substances containing chloride salts will avoid this type of damage.

FIGURE 86

Salt from perspiration caused deterioration of the underarm portion of this silk garment. Chloride salts weaken fabrics containing silk.



CHLORINE RETENTION

Why does this occur? Manufacturers may use formaldehyde resins to improve the crease resistance of a fabric; to stabilize a fabric for shrinkage control; or to give permanency to embossed designs. This type of resin combines with chlorine from a chlorine-type bleach bath.

When does this occur? It is sometimes necessary to bleach fabrics treated with a formaldehyde resin. The presence of this resin in the fabric is usually not recognizable. When placed in a chlorine bleach bath, the fabric usually turns yellow and may be weakened. When the resin combines with chlorine, it is very difficult, if not impossible to rinse the

newly formed compound from the fabric. When the fabric is dried and pressed, the resin-chlorine compound breaks down, causing the yellow discoloration and releasing hydrochloric acid. The acid causes the fabric to become weakened and may cause it to disintegrate.

How may this be prevented? Fabrics treated with a formaldehyde resin should not be bleached in a chlorine type bleach bath. If a fabric so treated is bleached in chlorine, the fabric should be treated immediately with a neutralizing agent like sodium bisulfite—before pressing. Other bleaches such as hydrogen peroxide and sodium perborate may be used safely on this type of fabric.

FIGURE 87

Fabric treated with a formaldehyde resin turns yellow when bleached with chlorine. Left: Original. Right: Fabric yellowed from use of chlorine bleach.



DEODORANTS AND ANTI-PERSPIRANTS

Why does this occur? Many deodorants and anti-perspirants contain two chemicals that have a destructive effect on many fabrics. They are aluminum sulfate and aluminum chloride. Both of these compounds have a tendency to hydrolize when wet or damp, forming sulfuric acid and hydrochloric acid.

When does this occur? Deodorants and anti-perspirants often are improperly applied and come in contact with a fabric. Over a period

of time they react with the perspiration from the body. Resultant acids weaken many fabrics. (12) Then when the fabric is flexed during cleaning the weakened areas may break into shreds or holes.

How may this be prevented? This may be prevented by the proper use and application of deodorants and anti-perspirants. The presence of deodorants in damaged areas may be determined by chemical analysis.

FIGURE 88

Two chemicals commonly found in deodorants and anti-perspirants, namely aluminum sulfate and aluminum chloride, when wet or damp form sulfuric acid and hydrochloric acid. The acid weakens fabrics to the point of disintegration.



DISSOLVING OF ACETATE

Why does this occur? Acetate fibers, yarns, and fabrics dissolve readily in many common reagents such as acetone, ethyl acetate, phenol, chloroform, and acetic acid in concentrations higher than 33%.

When does this occur? When a fabric comes in contact with a liquid that contains one of the above reagents, the dye may be affected. In addition, the fabric may be partially or completely dissolved. For example, some nail polish and polish removers contain acetone. If nail polish is spilled on a fabric contain-

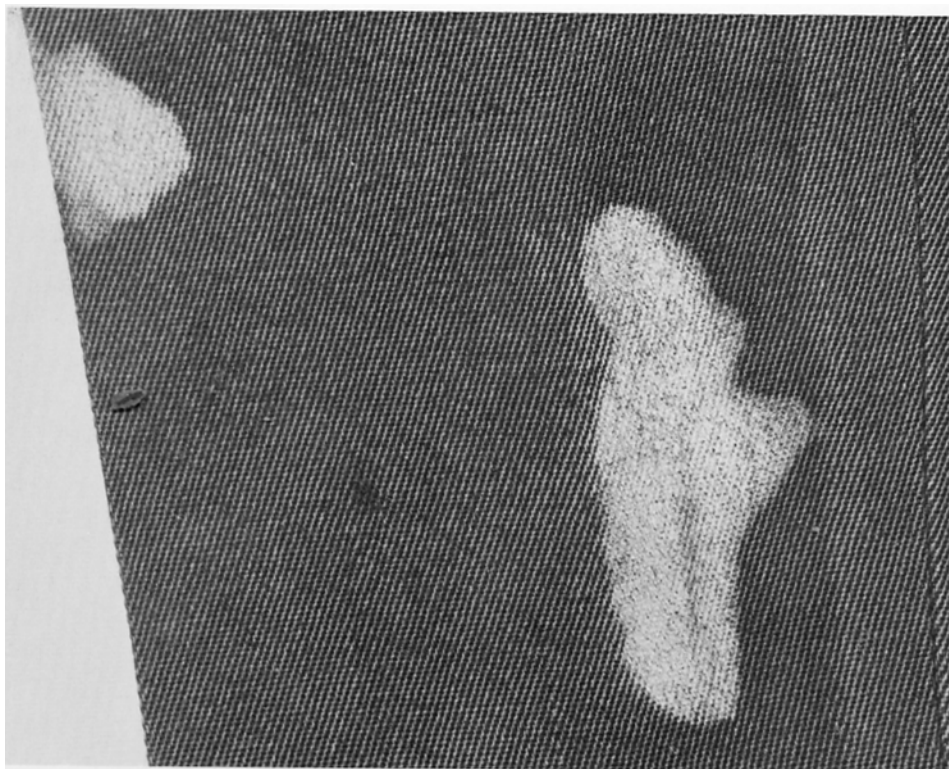
ing acetate and then an attempt is made to remove the nail polish with a remover containing acetone, the nail polish may dissolve and the fabric, too.

How may this be prevented? Once acetate fibers or yarns are partially or completely dissolved, the damaged area cannot be restored. The only way to avoid this type of damage is to exercise care in use. Do not allow acetate fabrics to come in contact with solutions that will dissolve the acetate fibers.

(Reference: NID Technical Bulletin T-129)

FIGURE 89

Acetate fibers, yarns, and fabrics are dissolved easily by many chemicals used in removing stains. Once the fibers are partially or completely dissolved, nothing can remedy the damage.



METALLIC CORROSION

Why does this occur? Some metallic fabrics and braids are made of textile yarns wrapped with metallic yarns. The metallic yarns usually have a copper core coated with nickel, tin, chromium, gold, or silver. The metallic yarns may also be coated with lacquer to protect them from the action of the atmosphere. If the lacquer coating is removed in wear or drycleaning, the copper may oxidize, causing a discoloration.

When does this occur? This damage may occur in normal wear or while the garment is stored. Atmospheric gases may cause some

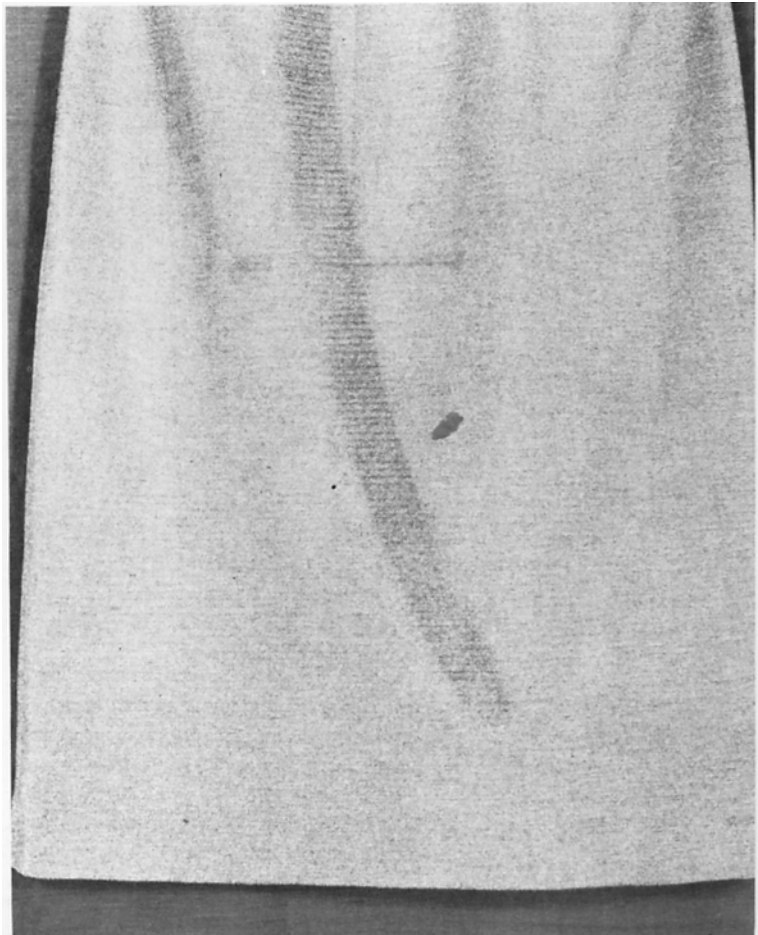
yarns to tarnish while the garment hangs in a closet. Another offender is perspiration which also may tarnish the copper. Improper use of some spotting reagents on metallic yarns may also result in metallic corrosion.

How may this be controlled? There are some types of metallic yarns that resist metallic corrosion. However, the inflexibility of these yarns limits their use in fabric design. Wider use of yarns with a protective coating will help to reduce this problem.

(Reference: NID Technical Bulletins T-72; T-220 and Fabrics-Fashions FF-36)

FIGURE 90

Some metallic yarns are very susceptible to corrosion. The bright silver or gold-colored yarns become dull.



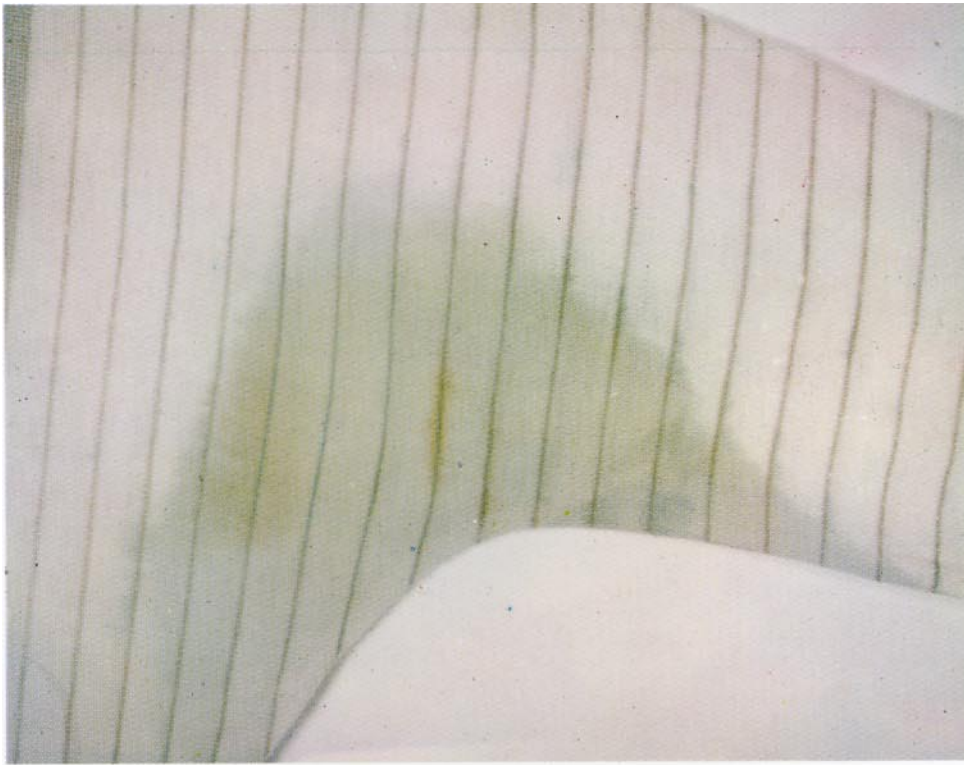


FIGURE 91

Some metallic yarns turn green from perspiration.



FIGURE 92

Some metallic yarns are affected by some of the common spot removal agents.

FIGURE 93

Removal of the lacquer coating from some metallic yarns may result in a darker or lighter area in a fabric. In the dress illustrated, the coating in two sections and one sleeve was not permanent and came off in dry-cleaning. The removal of the lacquer makes the yarns shiny in appearance.



OXIDIZING AGENTS (OXYCELLULOSE)

Why does this occur? Oxidizing agents convert the cellulose in cellulose fabrics such as cotton, linen, or rayon into oxycellulose. Oxycellulose is much weaker than cellulose. The oxidizing agents are usually bleaching compounds such as hydrogen peroxide or sodium hypochlorite. Such agents are used in the home and in commercial laundering and dry-cleaning plants.

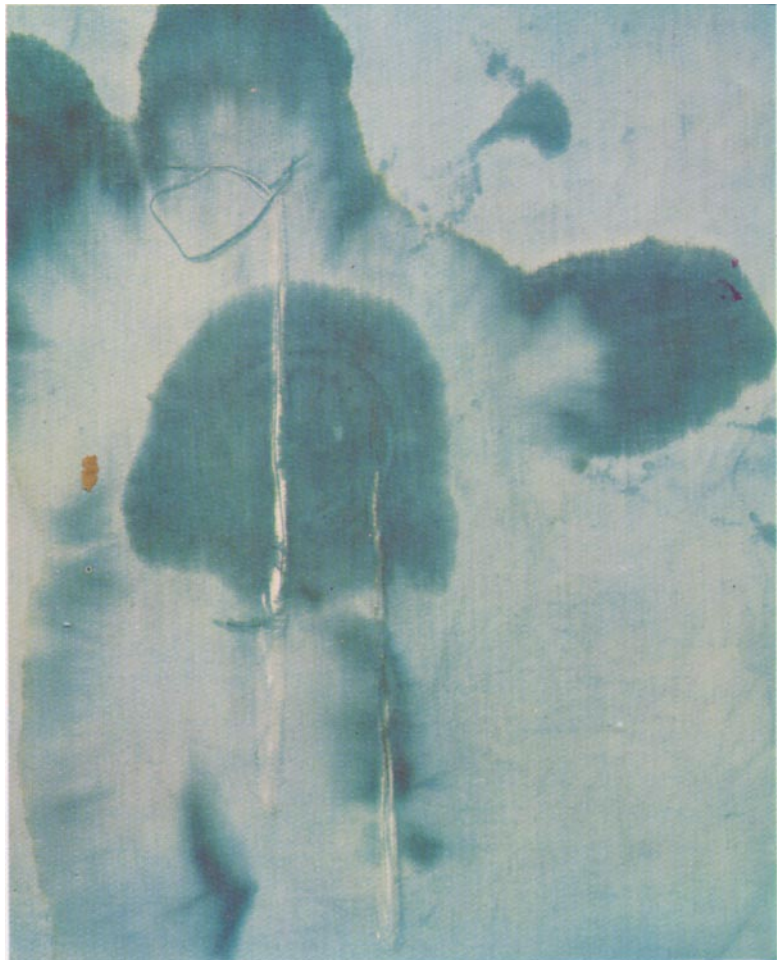
When does this occur? When a fabric comes

in contact with a bleaching agent for too long a time or in too high a concentration, oxycellulose is formed and the fabric weakened. Flexing of the fabric in drycleaning is sufficient to cause the weakened area to develop into a hole.

How may this be prevented? Care in the use of bleaches and substances containing bleaching compounds is the only way to avoid this type of damage.

FIGURE 94

A Turnbull's blue test was used in NID laboratories to determine the cause of the vertical slits. The dark blue color shows the presence of oxycellulose. (10)



SUNLIGHT DAMAGE

Why does this occur? Fiber deterioration in curtain, drapery, and sportswear fabrics results from exposure to either direct or indirect rays of the sun. All fibers, except Fiberglas, are subject to this type of damage, but the rate of deterioration varies according to fiber content, yarn and fabric construction, the textile finish applied, and the type of dyeing and printing applied to the fabric.

When does this occur? Conditions of use also contribute to this type of damage. Grime and dirt added to atmospheric acid fumes, heat from heating equipment, moisture in the air, all work together to reduce the tensile

strength and tear strength of these fabrics. Frequently the weakened fabric does not go into shreds or holes until it is subjected to the flexing action of drycleaning.

How may this be controlled? Some factors may be controlled at the point of manufacture; for example, by controlling the amount of delusterizing pigment used, or selecting dyes that are not supersensitive to light. Eye appeal rather than durability and serviceability often influences the purchase of this class of merchandise.

(References: NID Fabrics-Fashions Bulletins FF-1; FF-48; FF-49; FF-79; FF-82; Technical Bulletins T-74; T-95.)



FIGURE 95

Note that this fabric has weakened only in the yellow areas. The yellow dye has accelerated the sunlight's tendering action on the fabric. (14, 15, 16, 17, 18)

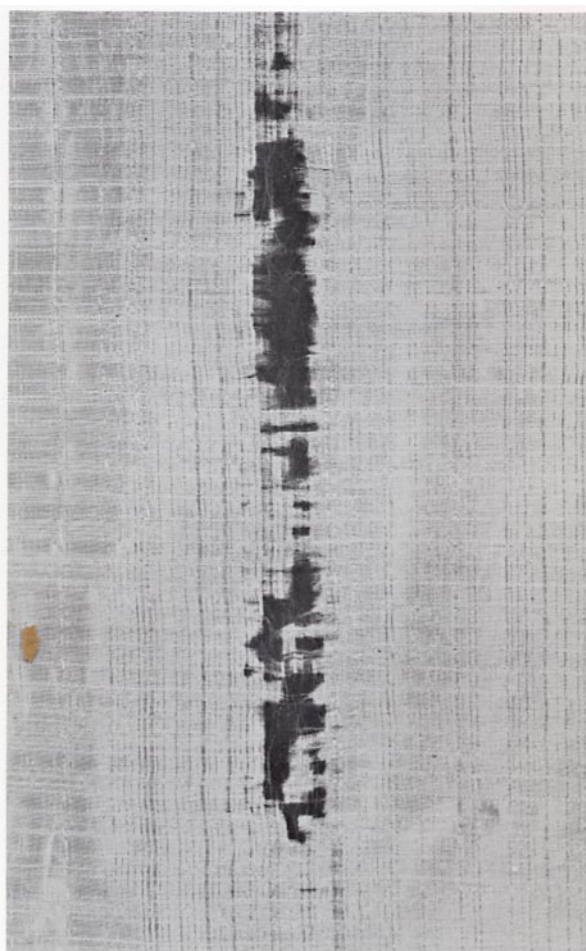


FIGURE 96

Curtains are tendered by sunlight. This tendering may not be noticed when the curtains are hanging. Drycleaning or wetcleaning may cause the weakened areas to split or break as illustrated.

YELLOWING AND GREYING OF NYLON

Why does this occur? Several factors contribute to the yellowing and greying of nylon: Improper classification in wetcleaning and laundering; too high a temperature during laundering and ironing of the fabric; improper rinsing of detergent or soap from the fabric; and the loss of fluorescent tints applied by the textile manufacture to make white nylon whiter. (See page 113.)

When does this occur? Yellowing or greying of nylon develops in prolonged use and laundering or wetcleaning. It may develop gradually over a long period of time.

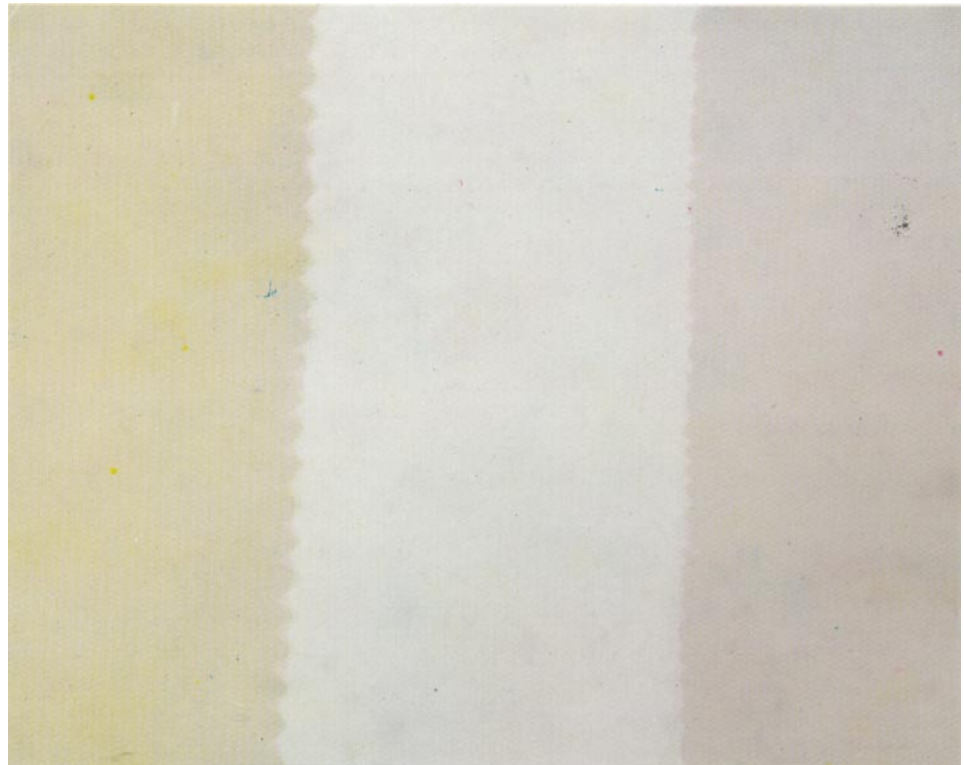
How may this be controlled? Much yellowing and greying may be eliminated by: Laundering and wetcleaning white nylons separately

from colored garments (nylon has a tendency to pick up color from dyes, although the colored fabrics show no sign of bleeding); soaking greyed garments in a solution of sodium hexametaphosphate (Calgon); laundering or wetcleaning in soft warm water with soap; if hard water is all that is available, use a built synthetic detergent containing a fluorescent brightening agent—*rinse thoroughly*. If a bleach is necessary, use a mild chlorine bleach followed by an antichlor rinse (sodium perborate bleach may be used, too). To reduce yellowness, add bluing to the last rinse. This may be effective in some cases.

(Reference: NID Practical Operating Tips Bulletin P-21)

FIGURE 97

Center: Original white nylon fabric. Right: Greying of nylon. Left: Yellowing of nylon.



DAMAGE TO FABRIC—MECHANICAL OR PHYSICAL

BREAKING OF YARNS

Why does this occur? Low tensile strength and low tear strength of the fabric may contribute to its susceptibility to mechanical damage. This can occur when tension or strain is put on the fabric during wear or during drycleaning. Sharp objects in contact with a fabric may also cause rips, tears, or holes.

When does this occur? In some cases, mechanical damage may be attributed to the basic construction of the fabric itself; carelessness in wear or mishandling in cleaning may also be responsible. It is frequently impossible

to pin-point the exact cause when this type of damage occurs.

How may this be prevented? Fabrics vary in tensile strength. Some tear easily. Carelessness in wear or in drycleaning, wetcleaning or laundering may also cause rips, tears, or holes. Best preventives are: (1) selection of fabrics of adequate fabric strength; and (2) care.

(Reference: NID Technical Bulletins T-271; T-301; Fabrics-Fashion Bulletins FF-1; FF-4; FF-12; FF-22; FF-24; FF-82.)

FIGURE 98

Typical fabric damage in a silk-and-wool fabric. The fine silk warp yarns become weak in areas where there is flexing in wear, and they eventually break — sometimes during drycleaning — sometimes before.



CHAFING

Why does this occur? Chafing is caused by excessive rubbing or brushing action on the surface of the fabric. Such rubbing or brushing breaks the fibers from the yarn. The broken ends protrude from the fabric surface. This causes a difference in light reflectance that may also appear as a color change. (See Loss or Change of Color: Abrasion, page 376).

When does this occur? This type of damage may occur in wear and in drycleaning. It is very difficult to determine, in many instances, the exact cause of the damage or when the damage occurred. Sometimes the wearer's occupation may be a clue. For example, a

silk dress worn by a stenographer was chafed across the leg area where the dress was in constant contact with the rough edge of a wooden desk.

How may this be prevented? Once this type of damage occurs, it is difficult to remedy. Damage may sometimes be masked by the use of oil dye pads after drycleaning. This is a temporary remedy since the compounds used will be removed in subsequent drycleaning. Care in wear and drycleaning may help to eliminate this problem.

(Reference: NID Technical Bulletin T-287)

FIGURE 99

Chafing of a fabric may raise the surface fibers, causing areas of the fabric to appear lighter or darker. Chafing may occur in wear or because of improper spotting methods.



FLATTENING, TUFTING, AND MATTING OF PILE

Why does this occur? Certain textile fibers are heat-sensitive. Others do not possess a great deal of resilience (the ability to recover when crushed or flattened). These fiber properties become problems in certain types of pile fabrics. Typical examples are rayon pile velvet that is not treated with a durable crush-resistant finish; acetate pile velvet; or the Orlon-Dynel fur-type pile fabrics.

When does this occur? Acetate pile velvet may flatten on contact with moisture and pressure in wear, drycleaning, or spotting. The pile of a rayon velvet that is not treated with a durable crush-resistant finish flattens simi-

larly. Wear and drycleaning cause some of the Orlon-Dynel fur-type pile fabrics to tuft (fibers bunch together), or mat (fibers flatten) from pressure of the body during wear, or if brushed while moist and warm with steam during finishing in the drycleaning plant.

How may this be remedied? Once an untreated or improperly finished rayon or acetate velvet pile is flattened, there is no way to make it stand upright again. Drycleaners and furriers have developed finishing techniques to improve the appearance of tufted Orlon-Dynel pile fabrics. But if the pile is flattened there is no way to restore it.

(Reference: NID Technical Bulletins T-222; T-223; T-324; Fabrics-Fashions Bulletins FF-8; FF-19; FF-20; FF-33; FF-41.)

FIGURE 100

Acetate pile velvet may be permanently flattened on contact with moisture and pressure in wear, drycleaning, or spotting.



FIGURE 101

Deep pile fabrics containing heat-sensitive fibers flatten permanently when brushed during steam finishing. Such fabrics also flatten from body heat and pressure in wear.

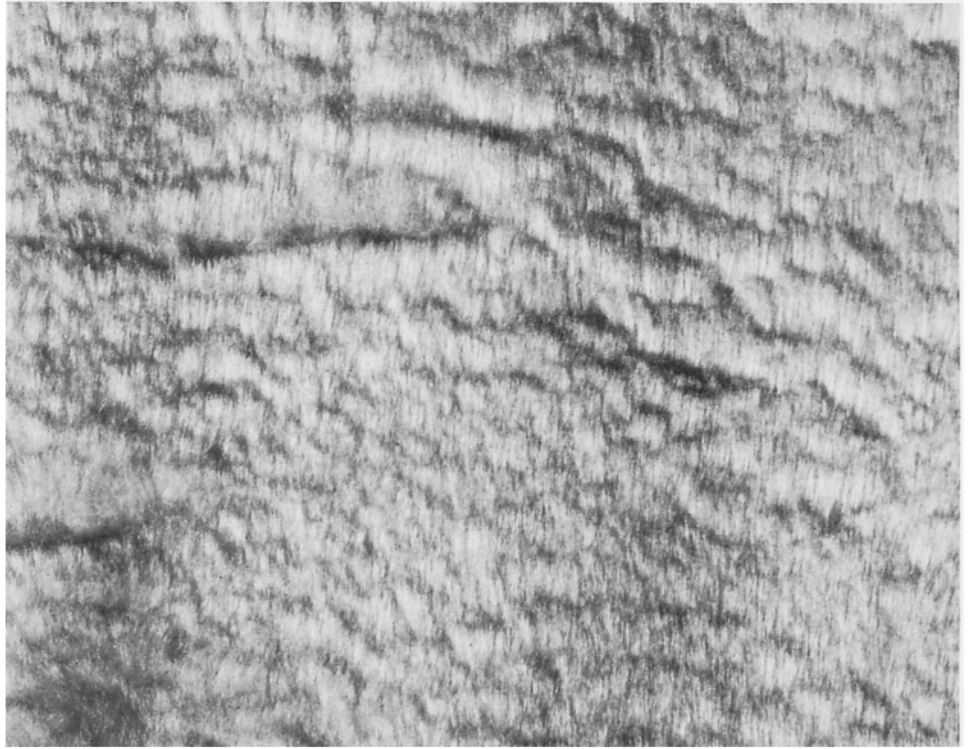
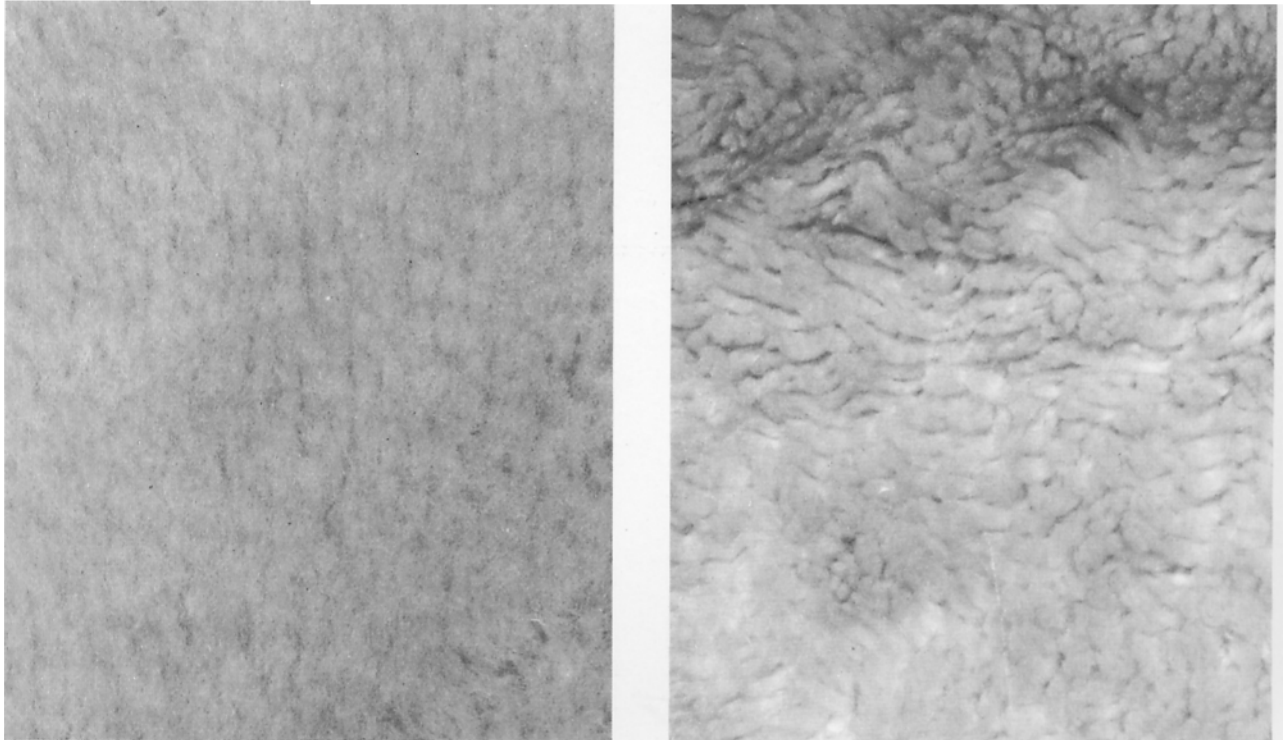


FIGURE 102

Tufting of deep pile fabrics usually begins in wear. Drycleaning may accentuate it. Left: Original. Right: Tufted pile.



INSECT DAMAGE

Why does this occur? Many insects feed upon certain fibers and certain finishes used in making fabrics. Many of these insects will feed upon food or beverage stains that are allowed to dry on a fabric. These common insects include moths, beetles, crickets, roaches, and silverfish.

When does this occur? Most common insect damage is that caused to wool and hair fibers by moth larvae. Synthetic fabrics, if soiled, may be damaged also. Larvae can and will eat the fabric and cause considerable damage. Insects will cut most textile fibers when they are feeding on the food stains left on a fabric. Sometimes this damage is not noted prior to cleaning. The fibers may be weak-

ened but not cut. Flexing of the fabric during cleaning causes these cut and weakened yarns to break and fall out, resulting in a hole.

How may this be controlled? Textile manufacturers have developed various types of moth-proofing finishes that may be applied at the time the fabric is manufactured. Some of these are permanent to drycleaning; others are not. Drycleaners are also in a position to treat garment and household items with a moth-repellent finish when they are drycleaned. There is less risk of insect damage if items are drycleaned and free from strains before storage.

(Reference: NID Technical Bulletin T-375.)

FIGURE 103

Note chewed edge of fiber as seen under a microscope. This is evidence of insect damage.

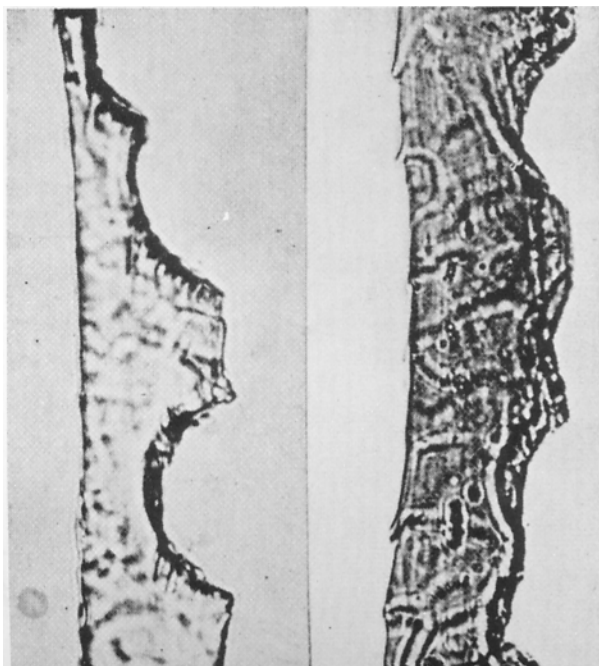


FIGURE 104

This wool fabric has been damaged by moth larvae.



DAMAGE TO FABRIC—HEAT

BURNING OR FUSING FROM HOT EMBERS

Why does this occur? Many of the textile fibers burn or fuse when in direct contact with a hot ember from a cigarette, pipe, or cigar. A spark or coal from an open fireplace may also cause such damage.

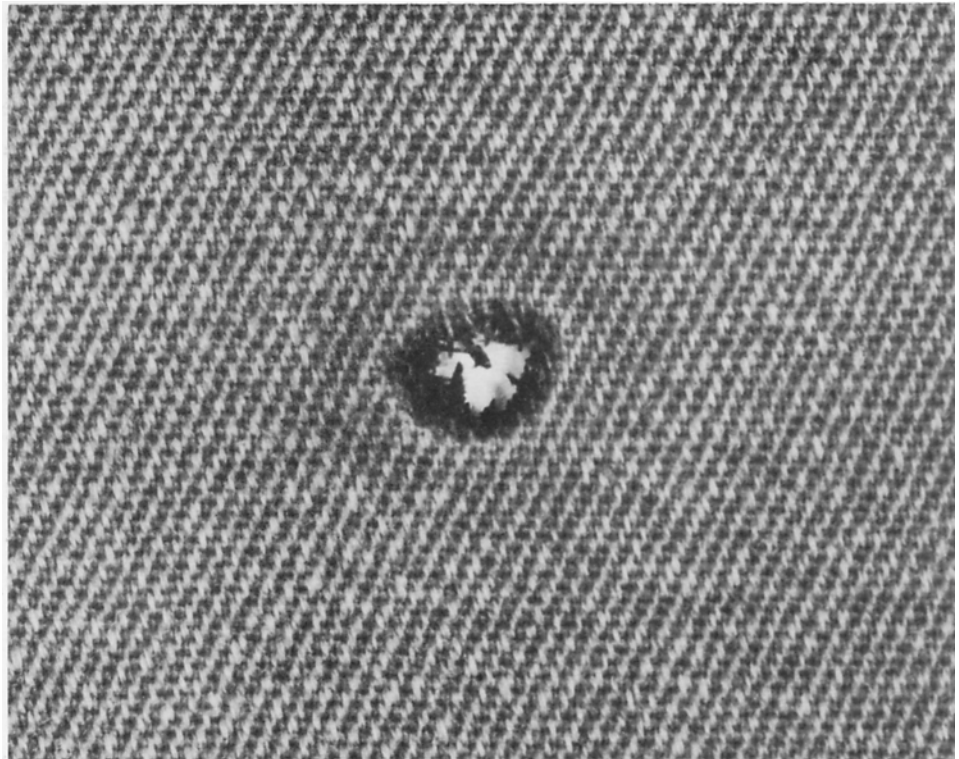
When does this occur? This type of damage usually occurs when the particular item is being worn or in use. An individual who does not smoke may have a garment burned by the carelessness of another person who

does smoke. In some cases a hole may not be evident and the damaged fibers may go unnoticed until the garment is drycleaned. Then the flexing action in drycleaning may serve to cause holes in the weakened areas.

How may this be prevented? Taking precaution against such damage in wear or use is the only certain way to avoid burned areas. Some fabrics can be rewoven satisfactorily. Others cannot.

FIGURE 105

A hot ember from a cigarette or a fireplace may result in fabric damage.



CREASING IN PRESSING

Why does this occur? Most garments have creases in such places as cuffs, collars, hems, or pocket edges. Some fabrics used in garment design are susceptible to damage by repeated creasings. On most fabrics this is not a problem. If a fabric is constructed of fine, highly twisted, tightly woven yarns, pressing of the fabric will exert a strain on the yarns along the edge of the crease.

When does this occur? After considerable wear,

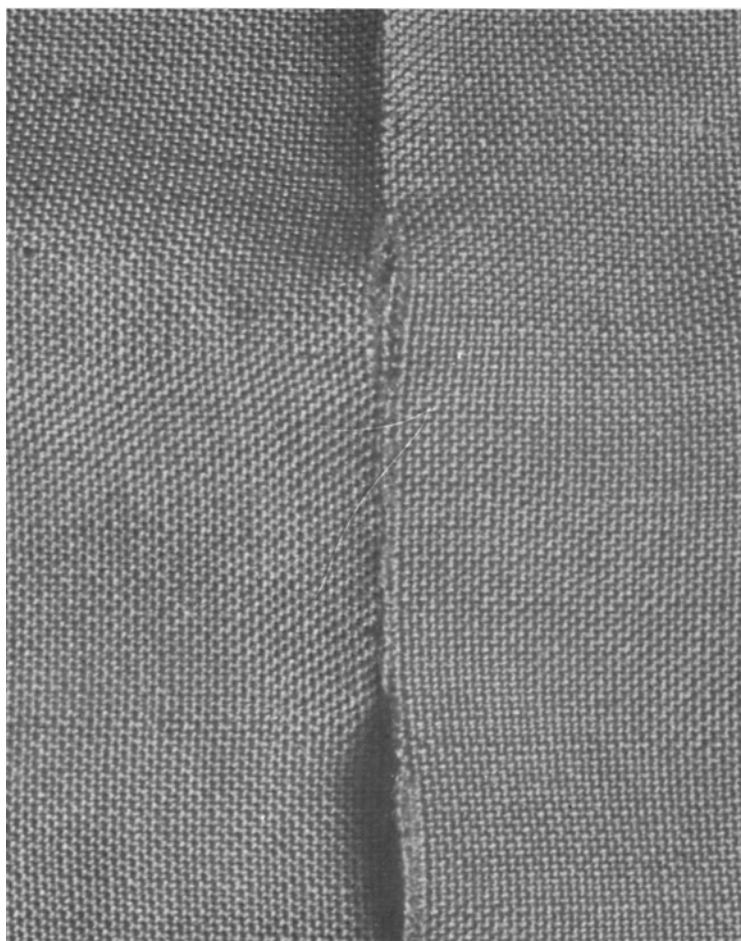
wrinkling, cleaning, and pressing, the strain on the yarns increases. If the strain becomes great enough, the fibers on the edge of the crease break.

How may this be prevented? When this type of damage occurs in garments not excessively worn, it must be attributed to faulty fabric construction. It can be prevented only by proper construction.

(Reference: NID Fabrics Fashion Bulletin FF-30)

FIGURE 106

Some fabrics, because of fabric construction, are susceptible to damage by repeated creasing.



GLAZING AND FUSING

Why does this occur? Glazing and fusing are caused by using too hot an iron on a fabric. Fabrics containing fibers such as acetate, nylon, Orlon, Dacron, Acrilan, Creslan, Dynel, Zefran, Saran or Rovana are particularly sensitive to heat.

When does this occur? Glaze marks are usually most noticeable on areas where there are two or more layers of fabric, such as seams or pockets. In some cases the fused fibers may split and develop into a hole. Fiber content and fabric construction usually determine the temperature at which a fabric

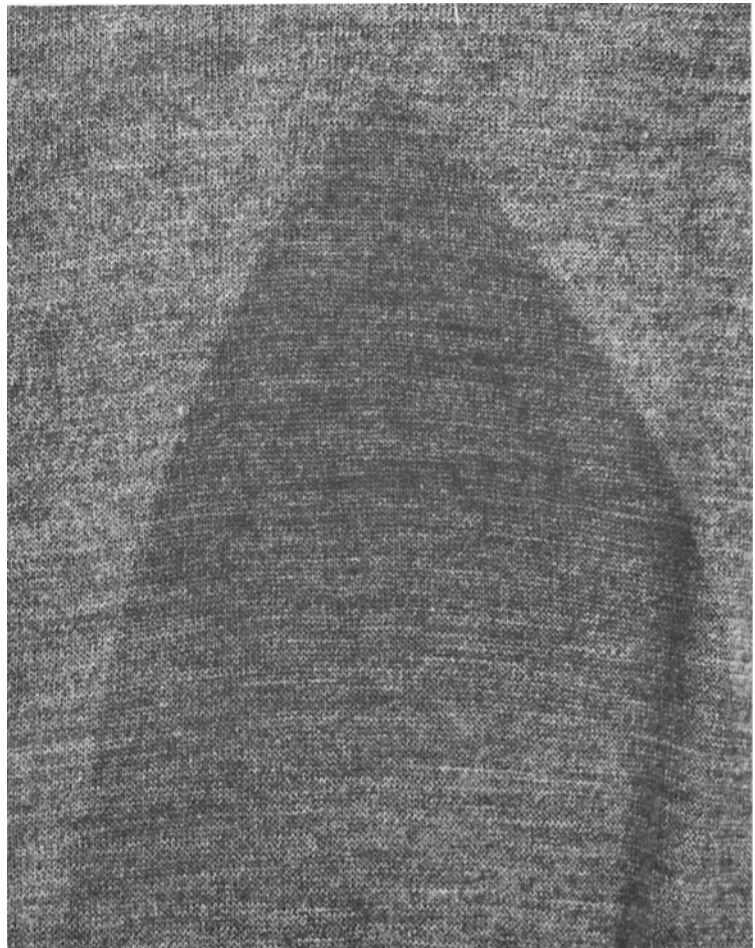
should be pressed. In some cases glazed areas have a glossy appearance; in others, the damage may show up as a hardened glossy area; in still others, it may show up as a darkened and hardened area.

How may this be prevented? If glazing or fusing has been severe it is impossible to remove the marks. Using the correct iron temperature for the particular fabric and pressing on the underside of the garment or fabric will prevent this type of damage.

(Reference: NID Fabrics-Fashions Bulletins FF-52; FF-97.)

FIGURE 107

Heat-sensitive fibers used alone or in combination with other fibers may fuse if pressed with too hot an iron or with a hot-head press. This 100% Dynel jersey is a typical example.



SCORCH

Why does this damage occur? Scorch is the burning of a fabric without the presence of a flame. Each textile fiber has a maximum ironing temperature. Beyond this temperature, the fiber is scorched, fused, or melted. (19)

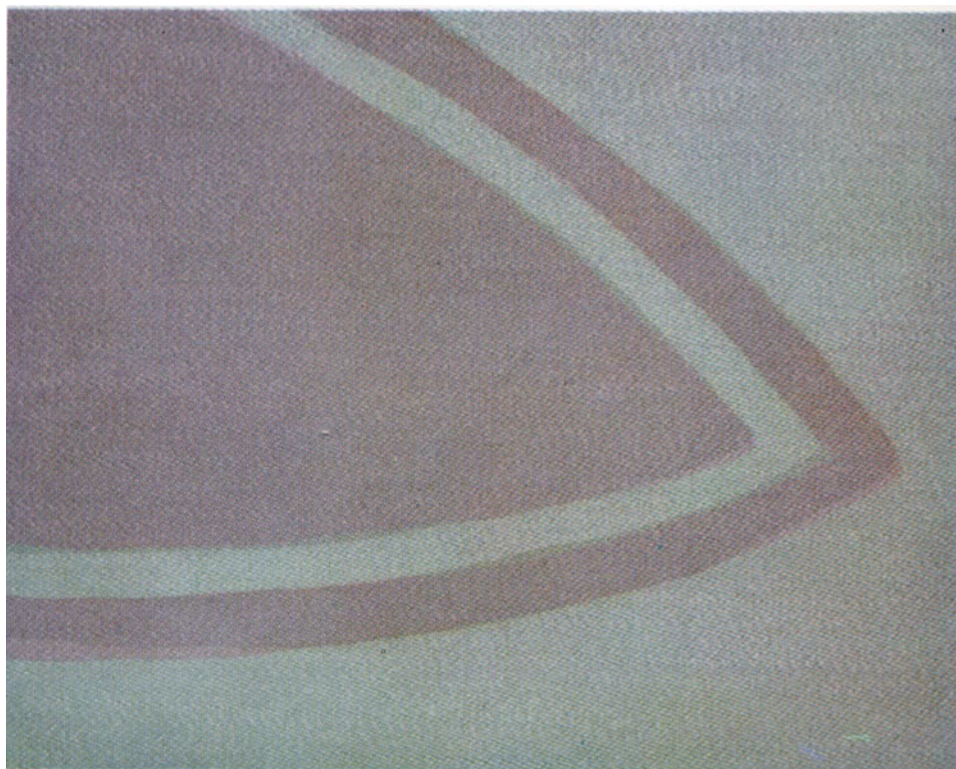
When does this occur? This type of damage occurs when a fabric is ironed with too hot an iron. The degree of damage is in proportion to the iron temperature. At a lower temperature the fabric may be damaged only slightly—it may be affected on the surface only. In extreme cases, the fabric may be charred all the way through. Severe scorch weakens the yarns to the extent that they

may break when the fabric is flexed in cleaning.

How may this be prevented? Finishing with steam-heated equipment eliminates the risk of scorching. Proper adjustment of thermostatically controlled irons to suit fabric requirements may also eliminate the risk of this damage. Numerous treatments for the removal of scorched conditions have been used with a greater or lesser degree of success. Bleaching has been found to produce the most satisfactory results, but even this has limitations. In many cases it is useless to try the treatment because of the risk of a hole appearing in the fabric where it has been scorched.

FIGURE 108

In extreme cases of scorching, it is useless to attempt removal, as the fabric is likely to fall to pieces.



SHINE

Why does this occur? Shine should not be confused with luster. Luster is the natural sheen that is characteristic of certain types of fabric construction. Shine is an unnatural gloss produced on a fabric by wearing, or the flattening of the ends of the fibers that protrude from the fabric surface.

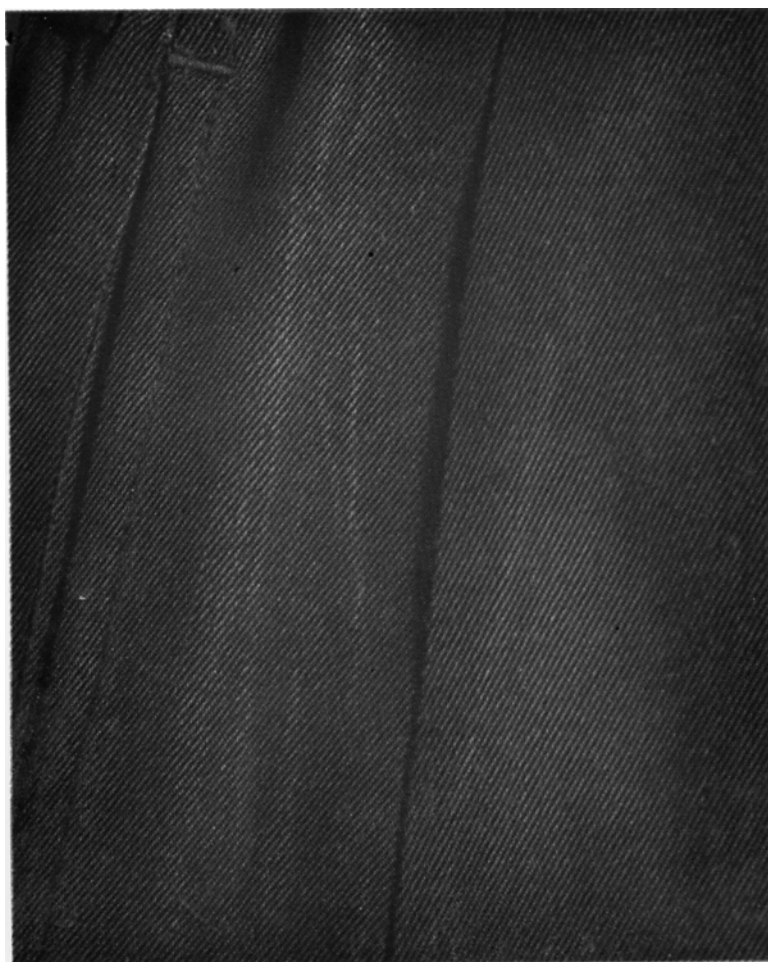
When does this occur? Shine may occur under conditions of normal wear, usually at the seat, elbows, or other areas of the garment that are subjected to abrasion or friction. It may also occur in home pressing, pressing a garment on the right or face side, double (two thicknesses of fabric), or while it is

damp. It may also result from using too hot an iron. If correct finishing techniques are used in a commercial drycleaning plant, shine should not occur in finishing.

How may this be prevented? This type of damage (other than that caused by wear) may be avoided by using the correct iron temperature for the particular fabric being pressed; pressing on the wrong side of the garment; or using a protective cloth and proper temperature on the right side of the garment. Shine may be partially or completely removed by special finishing techniques used in commercial drycleaning establishments.

FIGURE 109

Too much pressure and heat in pressing can result in shine.



SHRINKAGE OF FIBERS FROM HEAT—DACRON

Why does this occur? Cross-dyed and two-toned fabrics are made of white Dacron yarns blended with dyed wool, nylon, rayon or cotton. The white Dacron yarns shrink from the heat of pressing, exposing more of the dyed yarns. This gives the appearance of a dark oil or dye stain. The reverse could also be true. If the Dacron yarns were dark color and the wool, nylon, cotton or rayon yarns a light color, the damaged area would be light in color. In extreme cases of heat damage, the damaged area may be stiffened. Crinkled fabrics may be flattened due to shrinkage of Dacron yarns.

When does this occur? This damage may occur while a garment is being tailored, altered and pressed with a hand iron at a temperature higher than the rayon setting.

How may it be controlled? There is no way to restore the damaged area. It is important to control the temperature, pressure and time when pressing Dacron blended fabrics.

(Reference: NID Fabrics-Fashions Bulletins FF-52; FF-85:)

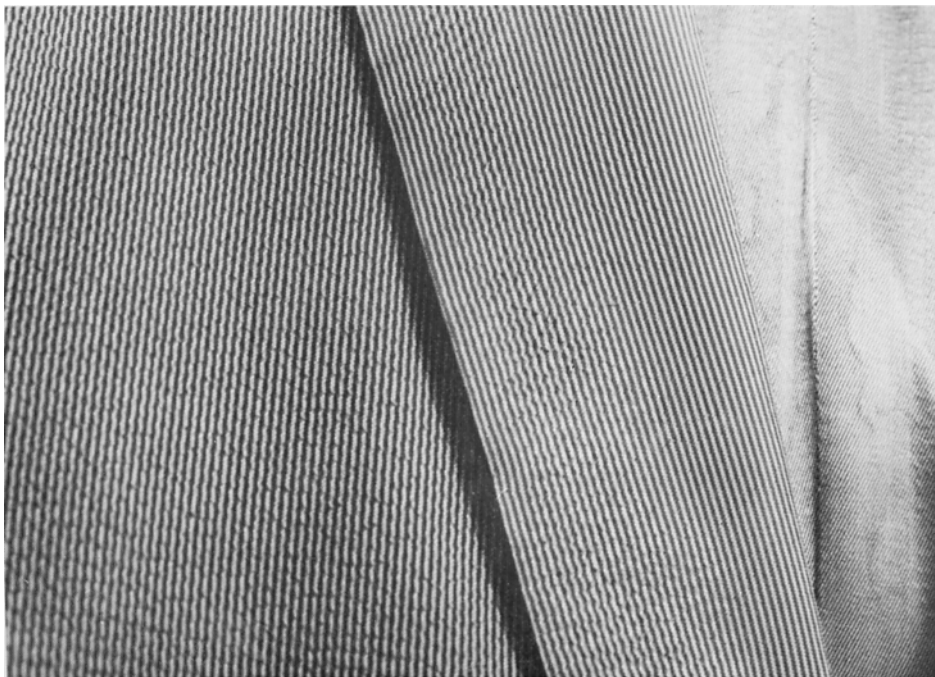


FIGURE 110

Heat in pressing causes the crinkled Dacron yarn to flatten due to the shrinkage of the Dacron fibers. (Note fold along the edge of the lapel.) Black nylon yarns are more visible on fabric surface.

SHRINKAGE OF FIBERS FROM HEAT—HEAT SENSITIVE

Why does this occur? Manufacturers may use the property of heat-sensitivity to an advantage in making fabrics with a three dimensional effect such as Matelassé. Heat-sensitive yarns are woven into the fabric to create a particular design. The fabric is then given a heat treatment to partially shrink the heat-sensitive yarns to form the puckered design. Sometimes the fiber is used every fourth yarn. The yarn is so fine it is hidden in the fabric and difficult to find.

When does this occur? When the fabric is dry-cleaned, dried and finished, the heat of drying and finishing causes the heat-sensitive yarn to shrink to a greater degree, causing excessive shrinkage. (See pages 538 and 539.)

How may this be controlled? Fabrics made of heat sensitive yarns cannot be restored to their original shape after excessive shrinkage has occurred. This type of problem can be controlled only at the source of manufacture.

FIGURE 111

This three-dimensional effect of this slipcover fabric is achieved by the use of a polyethylene yarn. The heat of drying and finishing causes the polyethylene to shrink excessively. The fabric cannot be restored to its original measurement.

