

# THE JOSPICE MATTRESS COVER IMAGE

© Frederick T. Zugibe, M.D., Ph.D., All Rights Reserved

**INTRODUCTION:** The Jospice mattress cover is a sienna colored, rectangular, three dimensional nylon cover and bears a striking image of the palm of a left hand accompanied by an image of the lower torso from the buttocks to below the knees, an image of the left arm, a fainter image of the upper part of the right arm, an image of the shoulders and an indistinct image corresponding to the lower part of the left face, all portrayed in a deeper shade of the mattress color. Father Francis O'Leary contacted me in June of 1986 offering me the opportunity to examine the mattress and to conduct tests on it. He arrived from England with the mattress cover and all of his medical records in August of 1986 (Fig. One).

**HISTORY:** The image was found on the mattress cover immediately following the death of a man named Les, a 44 year old (DOB 8/20/36) West Indian who died from terminal pancreatic carcinoma at the St. Joseph's Hospice (Jospice International) in Thornton near Liverpool, England).

The nurses that attended Les indicated that on the night prior to his demise, they rendered him pain free and attended to his needs as they arose that included alternating positions and pillows, giving him sips of water and etc... He was getting weaker as morning approached, and his urine output was poor at 5:30A.M. He became unresponsive and at 5:55 A.M., he passed away. The nurse found him with one arm across his chest, the other lying straight by his side with some of his fingers bent. His face had fallen slightly off the pillow. Following his death, when the nurse was cleaning the bed, she noticed the image on the mattress cover and despite scrubbing it with Savalon, a chlorhexidine gluconate disinfectant but indicated that the image was not affected.

The purpose of this paper is to investigate the nature of the mattress cover image and to compare it to the image on the Turin Shroud.

**CLINICAL BACKGROUND:** Les was admitted to the Fazakerley Hospital, Sefton Area Health Authority on December 10, 1980 with severe jaundice, abdominal pain and diarrhea and was diagnosed as having carcinoma of the head of the pancreas with multiple lung metastases. He was discharged on January 10th but was readmitted on February 2, 1981 for terminal care. On February 27th, he was given only about two weeks to live and was transferred to Jospice International in Thornton, near Liverpool, England. He died on March 9, 1981 at 5:55 A.M., 11 days after admission. During his hospital and Jospice admissions, he became incontinent, passing very dark (mahogany colored) urine that contained large amounts of bilirubin resulting from obstruction by the cancer. During his Jospice -admission, he suffered a great deal of pain requiring constant pain medications. In the last few weeks of life he received diamorphine, Dorbanex, Mogadon, Largactil, chlorpromazine, Stemetil, Duphalac, Dulcolax suppositories, and cocaine. On the evening prior to his death, he attended Mass, indicated he was enthralled by the Mass and was taken back to his room. Father O'Leary remarked that "Les looked so ill, yet he displayed a remarkable composure of mind and a dignity no sickness could destroy." He died at 5:55 A.M., March 8, 1981.

**MATERIALS AND METHODS:** The following investigations were conducted both on the Jospice Mattress Cover containing the image and on a new, identical mattress cover. Numerous Mylar tape samples and direct scrapings from both the image and non-image areas were taken.

**1. VISUAL EXAMINATION OF THE IMAGE:** The mattress cover was placed on a corresponding sized mattress and examined visually both under tungsten light, fluorescent light, ultraviolet light and in direct sunlight. It was then measured and the image described. The manufacturer of the mattress cover is at Leicshire Moors outside of Darwin. The mattress cover with the image was extensively photographed with a Leicaflex SLR camera with 50mm and 90 mm Leitz lenses in both black and white using Panatomic X film and in color using Kodachrome 40 film 5070 (Type A) KPA 135-36 with an ASA of 40. Negatives of the black and whites were also prepared.

**2. VIDEO CAMERA EVALUATION:** The image was carefully videoed with a Panasonic Color Video Camera Model WV-3400 and positive and negative images compared. The images were displayed on a 36 inch Mitsubishi Television Screen through a Magnavox VCR with quadruple heads using the pause setting and photographing the positive and negative images using a Leicaflex SLR camera with Kodachrome 40 film.

**3. ULTRAVIOLET LIGHT EXAMINATION:** The entire image was scanned in a completely darkened room with an ultraviolet light for the presence of fluorescence.

**4. DISSECTING MICROSCOPE EXAMINATION:** The weave pattern was examined and all image areas and adjacent non-image areas were meticulously studied through the entire range of magnifications from 10X through 60X magnifications using an American Optical Stereostar Zoom microscope with both indirect and direct lighting the weave patterns were photographed with a Leicaflex SLR camera with 50mm and 90 mm Leitz lenses using Kodachrome 40 film 5070 (Type A) KPA 135-36 with an ASA of 40.

**5. LIGHT MICROSCOPY AND MICROMETRY:** The weave pattern was examined and measurements of the individual fibers were made. Samples: Special Mylar Tape (3 M Corp.) samples were taken from the image areas including the hand, left shoulder, left inner thigh, and left buttock area and non-image areas adjacent to these regions by pressing the tape against the fibers and transporting them to microscope slides. In addition, scrapings of the image area of the hand, left shoulder and left inner thigh as well as scrapings of the non-image areas were taken using a fine scalpel. The tapes and the scrapings were mounted on microscope slides. A small sample of the edge of the mattress cover was taken measuring 1.5 cm. X 1.0 cm. and cut in a few pieces. Some of the fibers were teased from one end of each sample but still remained attached to it. Three pieces were mounted in mounting media and one was mounted dry. Individual groups of fibers were mounted with media of different refractive indices for differential visual contact and also with special media for fluorescent microscopy... A small piece of the cover was processed through paraffin and cross sections of the fibers were made. Samples were examined by **light microscopy** using a Leitz Ortholux Microscope equipped with a fully automatic Leitz Orthomat Camera, by **polarizing microscopy** using both the Leitz-Wetzlar Polarizer attachments including

integrating polarizing objectives and a Zeiss WL Pol Research Microscope also with integrating eyepieces and objectives, under a Zeiss Phase Contrast Microscope for **phase microscopy** using diffraction plates and by **fluorescence** microscopy using a Leitz Wetzlar Fluorescent Microscope with corrected objectives. The weave pattern was examined and microscopic measurements of the individual fibers in the mattress cover were made using a Leitz Screw Filar Micrometer Eyepiece # 519061 with Leitz Slide Micrometer for calibration at each magnification.

**6. TRIDIMENSIONAL COMPUTER IMAGING:** Photographs of the hand image were processed by Professor Giovanni Tamburelli using **3-D** processing equipment, a Varian 620/i Minicomputer (16K Memory Words) and a Tektronic videographic display.

**7. TEST FOR BILIRUBIN:** Micro amounts of brown to black amorphous-appearing matter found between fragments of nylon fibers on the hand image scraping as well as scrapings of the fibers in this area was placed against a moistened cut out bilirubin reagent strip impregnated with diazotized dichloraniline prepared by Ames and placed on a micro slide adjacent to a control moistened strip. Scrapings of a dark amorphous material and clear scrapings from non-image areas including an area a few centimeters below the left shoulder region and several centimeters below the left buttock were tested in the same manner as that of the image area.

## **RESULTS:**

A comparison of the mattress cover with that of the Shroud of Turin is given in the following chart.

## COMPARISON OF MATTRESS COVER AND TURIN SHROUD

CHARACTERISTICS	MATTRESS COVER	TURIN SHROUD
Fiber Composition	Nylon 6 (polyurethane coat)	Linen
Weave	Taffeta <i>type</i>	3 in 1 Herringbone, Z-Twist
Color of Garment	Sienna	Pale yellow
Color of Image	Brownish	Brownish-Yellow
Nature of Image	L. Hand, L. Arm, Should., Facial	Entire Body, Front and Back
Type of Image	Outline of body parts and Palmar	Variable intensity throughout
Nature of Image	̂Bilirubin Pigments????	Cellulose Oxid. & Dehydration
Photo. Negative	Present	Present
Ultraviolet Scan	No Fluorescence	No Fluorescence
Magnific. of Image	Image Not discernable	Image Present
Computer enhancement	Tri-dimensional	Tri-dimensional
Light Microscopy		
Image Fibers	Nylon w. non-luster. Punctate	Linen Morphology
Non-Image Fibers	Same	Image on Surface Fibrils
Polar. Microscopy		
Image Fibers	Birfringent --- Nylon	Birfringent--- Linen
Non-Image Fibers	Same	Same
Phase Microscopy		
Image Fibers	Character. of Nylon Fibers	Surface fibrils appear corroded
Non-Image Fibers	Same	Same

The results of our findings are as follows;

**1. VISUAL EXAMINATION:** The mattress cover had been manufactured at Leicshire Moors outside of Darwin and consists of a nylon taffeta weave. The manufacturers indicated that the nylon was nylon 6 and that the outside coating was polyurethane. The cover measured 75 inches X 33.5 inches X 5 inches and a tan colored, nylon zipper is present on one end of the cover.

**Characteristics of the Image:** The image ( Fig. 2) consists of faint sienna-colored outlines of the buttocks, thighs to just below the knees with the medial aspects darker than the lateral aspects, the left

side, darker than the right and an image of the palm of the left hand abutting the lateral half of the left buttock region. The hand image is striking (Fig.3) and shows the right lateral aspects of the thumb, the palmar aspect of all four fingers, and the small finger image consisting primarily of the distal phalanx with a dense line running to the base of the hand. It essentially consists of a broad outline of the outer edges of the hand with the finger region consisting of a wide outline running around, in between and away from the fingers and thumb with the density abutting the outer aspects of the thumb approximating the width of the thumb. The density around the fingers affords an effect likened to the back of the fingers lying in a small puddle. The image continues up the left arm on both sides almost to the elbow with the outer image continuing up to the shoulder and crossing transversely to and across the right shoulder and down the outer aspect of the left arm to about the level of the elbow. A faint outline of the side of the left jaw which appears to be slightly tilted downward is also present with some indistinct facial features above the jaw outline. The photography was very difficult because of the lack of contrast of the sienna color of the mattress and the deeper sienna color of the image. Attempts at overdevelopment of varying degree was unsuccessful and black and white prints did not appear to improve the picture quality. The black and white negatives provided a reversal of light values so that the image appeared in white rather than sienna colored but there were no dramatic effects. The kodachromes, however, afforded the best photos.

**2. VIDEO EVALUATION WITH AND WITHOUT REVERSE IMAGING:** The video images in positive mode offered nothing in enhancing the image but the negative or reverse mode particularly of the hand image showed details not easily discernable in positive mode. For example, all parts of the image were somewhat more vivid in detail and the features of the hand (Fig.4 ) and the facial region were enhanced over the positive images bringing out some facial details not seen on the positive (Fig. 5). The image, however, showed no resemblance to a photograph of the patient but appeared hazy with suggestions of a chin, mouth nose and eyes. Close examination, however, could not rule out an artifact or distortion due to the weight of the head region through the pillow since I was informed that his head was always on the pillow. Since the arm and shoulder images indicate that the shoulders, left arm and part of the outer

aspect of the right were flush to the mattress, the range of motion of the head to the left could not be greater than ninety degrees. This is confirmed by the nurse who found him on his back with the head slightly off the pillow. Moreover, these would not be in conformity with the characteristics of the images of the hand, arm and shoulder since the latter are only surface outlines and crease images. The image corresponding to the left chin or lower facial area is a deeper intensity and could conform to the observation made by Nurse Lavis who indicated that the face "had fallen slightly off the pillow" however, this does not offer an explanation for the features visible in reverse or negative mode.

**3. ULTRAVIOLET LIGHT EXAMINATION:** No fluorescence was noted either in the image or non-image areas.

**4. DISSECTING MICROSCOPE EXAMINATION:** The nylon fibers of the cover were woven in a taffeta weave. There was no distinction between the image and non-image areas as to morphology, intensity of staining, or color *per se*, even at junctional areas of the most intense staining that had been noted on gross inspection. The images were entirely invisible at every magnification from 10 X to 60 X.

**5. LIGHT MICROSCOPY AND MICROMETRY:** Light microscopy revealed a taffeta-type weave consisting of a crisscross pattern of fiber bundles perpendicular to each other (Fig. 6 ). Each bundle has a width of .27 mm. And consists of two overlapping rows of twenty fibers which alternate over and under a crossing bundle with ten of the fibers passing on top of a crossing bundle and ten fibers passing to the opposite side. (Fig. 7) There is a space of .06 mm. square where the bundles crisscross. The individual fibers average .024 mm. in diameter and its longitudinal configuration is typical of nylon which is confirmed by its almost triangular shape on cross section. The refractive index of about 1.5 and morphological characteristics was also consistent with nylon. The longitudinal view shows a punctated pattern within all fibers from both the image and non-image areas and appears consistent with titanium dioxide which was used as a delustering agent ( Fig. 8). The scrapings in the image areas of the hand and shoulder consist of brownish to almost black particulate admixed with fragments of a clear amorphous substance consistent with polyurethane scrapings and small fragments of nylon fibers (Fig. 9).

The non-image area below the buttock image however, contained a clear amorphous substance with a brownish to black particulate but the area below the shoulder contained a clear amorphous material with only tiny amounts of dark particulate. **Polarization microscopy** of the fibers revealed a pseudo-crystalline structure with birefringence (Fig.10). None of the brownish to black particulate is present within the fibers in the hand image area or shoulder image area, and the clear amorphous material is better defined than with light microscopy. **Phase microscopy** afforded a clear definition to the very thin coating of a clear amorphous material on the surface of the nylon fibers which appears consistent with the reported layer of polyurethane. Again there is an absence of the brown to black particulate within the fibers but appear admixed with the clear amorphous material. Fluorescence microscopy afforded no evidence of fluorescence on any of the fibers on the slides which contain the scrapings from the hand, shoulder or inner thigh regions.

**6. TRIDIMENSIONAL COMPUTER EVALUATION:** The hand and fingers stand out in relatively sharp relief (Fig. 11 ). Note the thenar bulge and depth of the creases. The finger tips afford the effect of rounded pads. The distal phalanx of the little finger is absent but the proximal aspect appears to be present which is the reverse of what is observed on the actual image.

**7. BILIRUBIN TEST:** The entire test strip afforded a weakly positive reaction (tan color) with some of the material scraped from the hand image area within the 20 second response time as required . The test afforded negative results with the specimens from the non-image areas. Other scrapings afforded negative tests. The test is based on coupling of bilirubin with diazotized dichloroaniline in a strongly acid medium. The color ranges through various shades of tan.

**CLINICAL EVALUATION OF MEDICATIONS:** The medications that were given in the last few weeks of life which included **diamorphine**, a diacetyl morphine which is a very potent analgesic; **Dorbanex** (Riker Labs), is utilized for constipation and is composed of 1,8 dihydroxy- anthraquinone, and poloxalkol; **Mogadon**, (Roche), is an hypnotic composed of 7 nitro-1,3 dihydro-5-phenyl-2H-1,4-benzodiazepine-2-one; **Largactil**, is a anti-hyperthyroid drug; chlorpromazine, is a dimethylamine derivative of phenothizine of the aliphatic group used as a tranquilizer; **Stemetil**, is used for the



prevention and treatment of nausea and vomiting and is composed of 4-methylpiperazinylpropylphenothizine; and **Duphalac** is used for treatment of constipation and is composed of lactulose, lactose, and galactose; **Dulcolax** suppositories, are composed of bis(p-acetoxyphenyl)-2pyridyl-methane and are used for constipation; and **cocaine** is a benzoic ester of the base ecognine and is used as a topical anesthetic, and systemically has been used to bring on an euphoric state. Chlorpromazine given the last two days prior to his demise is an aliphatic phenothiazine with strong alpha-adrenergic blocking activity.

### **DISCUSSION:**

There are many points of dissimilarity of this image to the one on the Turin Shroud ( Table One ). Although the slightly positive reactions for bilirubin, on some of the scrapings from the hand area appear inconclusive, the negative results from all the non-image areas appear peculiar. We do know that the clinical notes indicate that the decedent was incontinent of a large amount of dark, concentrated mahogany colored urine resulting from his pancreatic carcinoma. One might further speculate that the reason for the only slight reaction for bilirubin derives from the scrubbing of the mattress cover by the nurse right after Les died. But if it is due to the bilirubin, why is there no bilirubin staining on other areas of the cover? Some experiments performed by Dr. Brian Sagar from the Shirley Institute for Textile Research in England who studied the mattress cover initially appeared to explain this. He found that liquid could be forced through the polyurethane at a load of 1/3 lb. per square inch which would be less than the weight of the body. He was able to produce an image on a similar mattress cover by applying some type of dye around a hand model and applying appropriate weights for about 24 hours. Unfortunately, Dr. Sagar was unable to produce an image if a sheet was interposed between the hand model and mattress cover. Could Les have been off the pillow and lying naked on the cover for a while and the urine containing the large amounts of pigment under his body forced through the thin polyurethane layer by the weight of the body. In this scenario, the weight of the body could also account for the negative finding on the other areas of the cover. The decedent was found lying on his back with his left arm straight to his side with some fingers bent and his face had fallen slightly off the pillow. The right arm was lying across the chest and most of the left hand is under the left buttock. Therefore, a

significant amount of weight was exerted on the hand from the weight of the body on the hand and in the shoulder area, the weight of the head on the lower part of the face area and on the shoulders. The nurse indicated that some fingers appeared to be bent which would explain why only the proximal phalanx of the little finger of the left hand is outlined and a dense line is present in the area of the middle and distal phalanges. But Father O'Leary and the nurse vigorously insisted that Les' head was never off the pillow and the sheet was always on the bed and stressed that whatever caused the image definitely had to pass through the polyurethane layer and deposit either within the polyurethane or on the surface of the fibers after passing through the pajamas worn by the patient, through the top of a pillowcase, through one or two pillows, through the bottom of a pillowcase, and a cotton bed sheet. The following hypothesis, however, might explain the image mechanism; if the patient wet the bed a number of times as indicated in the clinical charts, the thick, dehydrated, mahogany urine containing large amounts of bilirubin would soak through the sheets on to the underlying mattress cover. During the linen changing procedure, the wet linen is removed and replaced with new linen. Urine residuals containing bilirubin pigment, however, would remain on the mattress cover. Now if in the interim prior to death, pressure was exerted on the mattress cover by the weight of the body with the hand under the left buttock and he urinated again, the dried urine residues containing the pigment would be liquefied and the weight of the body with the hand under the buttock and in coma and death might force some of the pigment through the polyurethane layer. The weakly positive tests for bilirubin on the scraped fiber material from the image area appears to support this hypothesis for the left hand, buttocks, legs, arms and shoulders. The facial characteristics as indicated above appears to have a completely different mechanism and may in fact be entirely artifactual since even Father O'Leary related that these features do not resemble Les.

Elucidation would require taking additional scrapings of the facial region and testing for bilirubin.

It may be of interest to note that Professor Phil Callahan attributes the image on the cover to the formation of an "electret" image. He relates that "Since sweat contains iron oxide from blood....." "The hospice print, unlike the Shroud is positive because the sweat (sea water) flowed down the body wall and deposited around the body. Iron (Fe) is magnetic, but iron oxide (oxidized blood) is paramagnetic (weak magnetic force) (CGS of 7200 for the physicist). The negative iron oxide ions were attracted to

the positive (top) side of the electrets due to the opposite charges. The oxide fixed itself permanently on the electret mattress cover."

**CONCLUSION:** Positive and negative macrophotography, positive and negative video photography, stereo-dissecting scope examination, ultraviolet scanning, tri-dimensional computer imaging, light microscopy, polarizing microscopy, phase microscopy, fluorescent microscopy, micrometry, microchemical analysis etc. were conducted on the Jospice Mattress A comparison Cover. Scrapings from the image area afforded a weakly positive reaction for bilirubin pigment deposition probably from the bilirubin in the patient's urine being forced in some manner through the thin polyurethane layer of the nylon fibers, within or between the polyurethane coat and the nylon fibers. One, however, cannot fully rule out a bilirubin residue left on the mattress cover despite the alleged washing of the cover after the patient died. Hypotheses are fully discussed above. Many dissimilarities are noted when comparing the mattress image with that of the Shroud of Turin.

**Acknowledgement:** Special Thanks: to the late Giovanni Tamburelli and Nello Ballosino from the Centro Studi e Laboratori Telecomunicazioni for preparing the 3-D photos.

ILLUSTRATIONS BEGIN ON THE NEXT PAGE



Figure01.jpg



Figure02.jpg



Figure03.jpg



Figure04.jpg

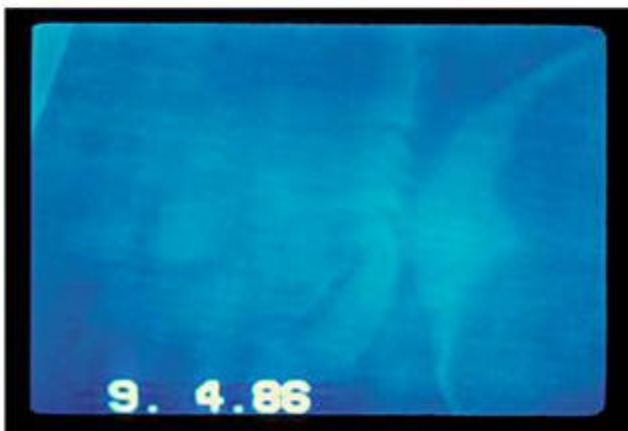


Figure05.jpg

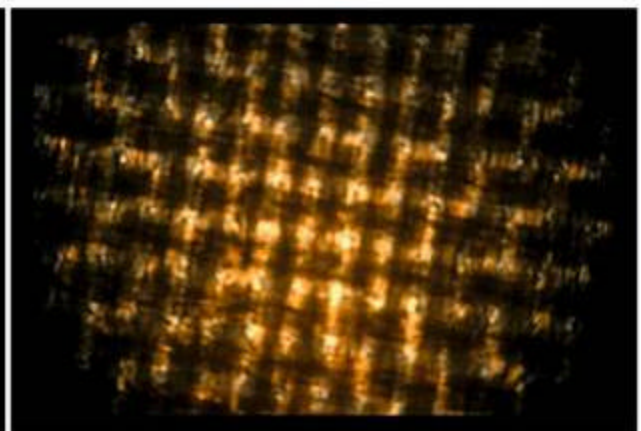


Figure06.jpg

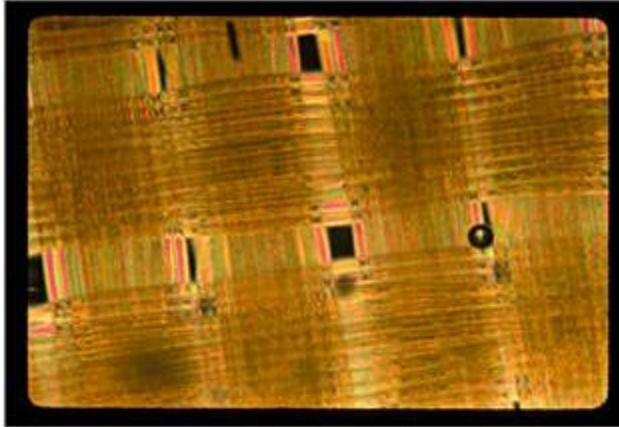


Figure07.jpg

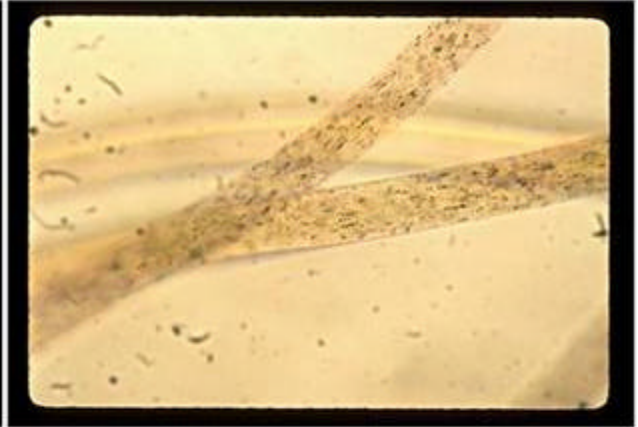


Figure08.jpg

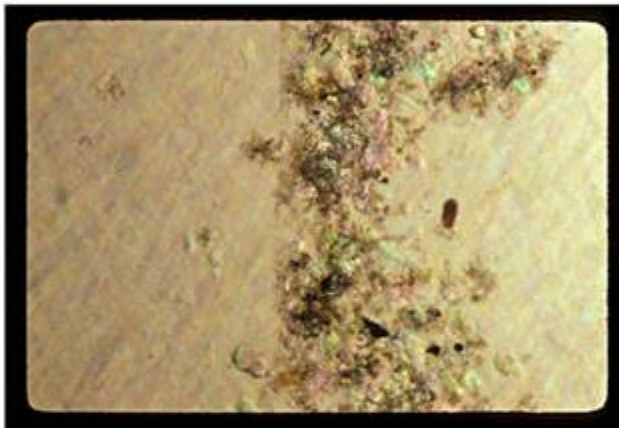


Figure09.jpg

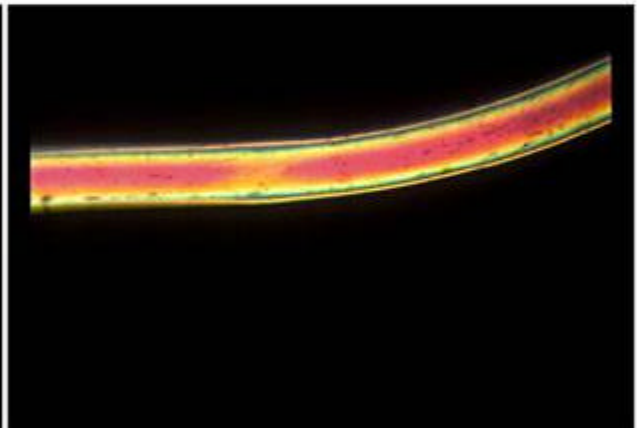


Figure10.jpg



Figure11.jpg