



7-25-1958

## 58/07/25 Lab Examination Letter from Gerber to Story re: 1958 Materials Found

Samuel R. Gerber MD  
*Cuyahoga County Coroner's Office*

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# COUNTY OF CUYAHOGA

CORONER'S OFFICE

## CLEVELAND, OHIO

 Cuyahoga County Coroner's  
Office

MARCH 1996

Case # 76629

A-29

H29

July 25, 1958.

Frank W. Story, Chief of Police,  
Cleveland Police Department,  
E. 21st and Payne Avenue,  
Cleveland, Ohio.

Dear Chief Story:--

On May 15th, 1958 Detectives Dombrowski and Andes of the Scientific Investigation Unit of the Cleveland Police Department submitted to this office a piece of wood, a portion of tubular seamless knit cotton material and a rock.

This material was said to have been found near Elyria by two boys who turned it over to William J. Corrigan, Counsel for the defendant in the case of the State of Ohio vs. Samuel H. Sheppard. We were told that Mr. Corrigan turned the material over to Inspector Blackwell suggesting possible association with the murder of Marilyn Sheppard on July 4th, 1954.

A summary of the laboratory examinations performed in this laboratory and opinions of experts consulted follows:---

Tubular seamless machine-knit cotton material:-

The material submitted measures approximately 34 inches in circumference through the center and approximately 36 inches at the edges. At one edge there is a machine stitched hem approximately 3/4th inch in width. The other edge presents appearance of having been torn from another portion. Measurement from torn edge to bottom of hem is approximately 18-1/2 inches.

At the torn edge and extending about half way to the hem edge there is an area which presents numerous small and large holes apparently due to wear and/or microbiological deterioration. Fewer such defects are noted in the area of the hem. The material is markedly thin and friable in the area of the most defects, particularly in one area at the torn edge. By contrast, the area nearer the hem seems strong and remarkably well preserved. The largest defects are in that half of the circumference of the material which presents the greatest amount of soiling and staining. This staining consists of (1) grey punctate stains characteristic of mildew by certain molds; (2) general light brown staining; (3) green streaks and (4) light brown definite stains (apparently rust stains).

#2----Frank W. Story, Chief of Police-----7/25/58.

Although this material presents varying stages and types of deterioration, there is nothing to arouse a plausible suggestion of exposure to weathering over a period as long as four years. Neither is there anything to support a suspicion that this material had been stored under cover in a stained condition and recently discarded. Nevertheless, several chemical and immunological tests for the detection of human blood were applied with negative results in every instance.

Various areas were subjected to extensive chemical, bacteriological and microscopical examinations to determine the extent and cause of deterioration and staining and to search for trace evidence. It was established that the grey punctate and yellow-green staining were due to molds commonly known to cause mildew on fabrics, particularly those made from cellulose fibers such as cotton. A waxy substance was extracted from the generalized gray and light brown stained areas. Although attempts to identify this wax by infra-red spectrophotometry were unsuccessful, the high refractive index (1.5465 at 44°C) and a high melting point exclude animal or vegetable origin. Portions of material which were not stained failed to yield any wax. This would seem to indicate that this material might have been used as a polishing rag.

Rough measurements of the tensile or tear strength were conducted on standard strips from the stained and unstained areas of the fabric. Standard strips measuring 6"x1-1/2" were cut out with the length vertical to the hem edge. The unstained area supported 3500 grams (approximately 7 pounds) stretching 1-1/4th inches without any indication of tearing. A similar strip from a T-shirt which had been subjected to moderate wear and normal usage and which had been stored in the vault in this laboratory for approximately four years also supported an equivalent weight stretching approximately 2-3/4th" without tearing. The strip from the stained area was selected with careful attention not to include any holes. Tests on this strip were conducted at the same time and under identical conditions. This strip supported weights added gradually, as in the other tests, in increments of 100 - 200 grams up to 2000 grams (four pounds) at which time it gave away tearing across the strip abruptly. The maximum stretch measured was 5/8th inch.

NOTE:- A search of the literature failed to reveal reports of any deterioration studies on this type of fabric. However, standard studies on microbiological deterioration of cotton duck not treated for mildew resistance report as high as 100% loss of strength after 14 days. The degradation of the fabric is dependent to a great extent upon the species of micro-organisms involved. Detailed identification of the mold isolated by cultures from the fabric submitted to us are not fully completed at this time and their cellulolytic activity has not been determined.

Because of the complexity of this study we consulted textile research experts.

#3----Frank W. Story, Chief of Police-----7/25/58.

One expert's opinion included the following statements:--

"The lack of information as to which side of the garment was against the terrain and which was exposed to the sun and the elements creates a problem in decision. The reason for this is that in the type of climate which has been described, the incidence of mildew is not very great. Accordingly, I am inclined to the idea that the degradation of the garment occurred in that portion of the garment which was exposed to the sun and elements. If the garment has been out for a period of four summers and assuming that it was in the direct path of the sun for at least the better portion of each day, it is estimated that this will have had a minimum of 200,000 to 250,000 Langley's of radiation. Under these conditions a cotton fabric would be completely weakened to the point where it would have very little residual strength.

"If the areas which have degraded away received sufficient radiation to cause them to disintegrate, this would indicate that the length of time as measured by radiation units would be at least equal to the minimum equivalent of 200,000 Langley's. This of course is a discussion and cannot be supported by experiment since the material has disappeared."

COMMENT:- Marked deterioration is perceptible in only one area at the edge which has been described as "torn". This fact plus the fact that the edge is fairly straight has been interpreted as evidence that the missing portion of the material was separated from the portion submitted by mechanical force rather than by degradation due to exposure.

The opinion of the expert continues:-

"The evidence of a simple experiment would indicate that there is sufficient residual strength in the material so that the amount of radiation reaching the remaining degraded portions must be somewhat less than the minimum of 200,000 Langley's. However, if the material was folded down so that it was semi-protected from the sun's rays and the elements, the amount of radiation and therefore degradation, would be expected to be less than that which struck the areas which have disappeared. Some mildew has occurred and would be expected. It is believed on rather close examination that the green, orange and brown spots in the garment represent various types of mildew which have occurred. The degree of this formation is such that knowing the general characteristics of the type of climate involved could have occurred in a period of several years, but whether this could have occurred in a period of four years is extremely difficult to tell at this stage of the game.

#4----Frank W. Story, Chief of Police----7/25/58.

"I know that what I have said seems very indefinite but there are so many unanswered questions about the material that a positive statement would be extremely difficult to make."

Chemical tests and microscopic examination conducted in our laboratory revealed deterioration of fibers typical of damage due to chemical, mechanical and microbiological and heat or light effects. The predominance of each being dependent upon the site from which the test material was selected. Other portions showed little or no damage effects. These results are interpreted as indicating that some of the damage was due to the original processing of the fibers, some due to use, some due to microbiologic damage and a small portion, where the material is most friable near the torn edge might have been due to exposure to light. The degradation due to microbiologic damage was not striking in any of these tests. Since the cellulolytic activity of the mold involved is not known at this time no definite conclusions can be drawn.

Microscopic examination of particulate matter recovered when portions of the fabric were teased apart and ravelled failed to reveal any evidence suggestive of the source or use of this material.

In summary, after extensive study of this material by this laboratory and consultants experienced in the study of the effects of weathering on textiles, it is not possible to arrive at any definite and conclusive evidence of the duration of the exposure or the original source of this fabric.

Piece of wood:--

The piece of wood submitted at the same time was apparently a section of a branch of a soft wood tree. It is obvious that there has never been any kind of finish applied to this wood. Where twigs have broken off, the exterior is rough. The specimen submitted measured four inches in length x 3-1/2 inches in circumference and weighed approximately 8 grams (roughly about 1/4th ounce). It is inconceivable that anyone could be serious in suggesting that this was a portion of any weapon capable of inflicting the type of injuries seen on the head of Marilyn Sheppard at the time of autopsy. Microscopic examination of longitudinal and cross sections confirm the impression that this is a porous wood. Longitudinal section reveals a yellow pith 1/4th inch wide in which there are many black fruiting bodies of black mold. The sapwood is nearly white and measures 5/16th--3/8th inch in width on either side of the pith. A light grey-brown layer which can be easily separated from the sapwood would appear to be the cambium layer. It measures 1/16th--1/32nd inch in thickness. The outer surface presents areas of dark brown staining which appear resinous and appear to be dried sap when examined under the stereomicroscope. These areas were subjected to chemical tests for blood with negative results. The entire piece of wood has a driftwood appearance suggesting that it has been subjected to thorough soaking and drying repeatedly.

#5----Frank W. Story, Chief of Police-----7/25/58.

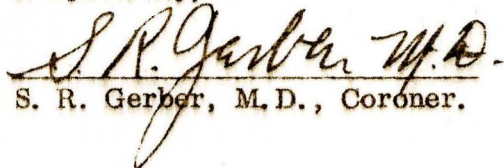
Rock:--

The rock submitted was examined by an experienced geologist who identified it as a piece of Berea sandstone which he stated is found throughout northern Ohio from an area reaching from Sandusky Bay eastward to central Pennsylvania. There is nothing in this particular fragment of rock which would permit him to make any type of dogmatic statement as to its exact place of origin. He observed that the shape of the stone with tool marks on it indicates that it has probably been used for some type of building purpose.

SUMMARY:--

An exhaustive study of this material failed to yield any evidence to warrant suspicion that it could have been associated with the murder of Marilyn Sheppard.

Respectfully,

  
S. R. Gerber, M.D., Coroner.