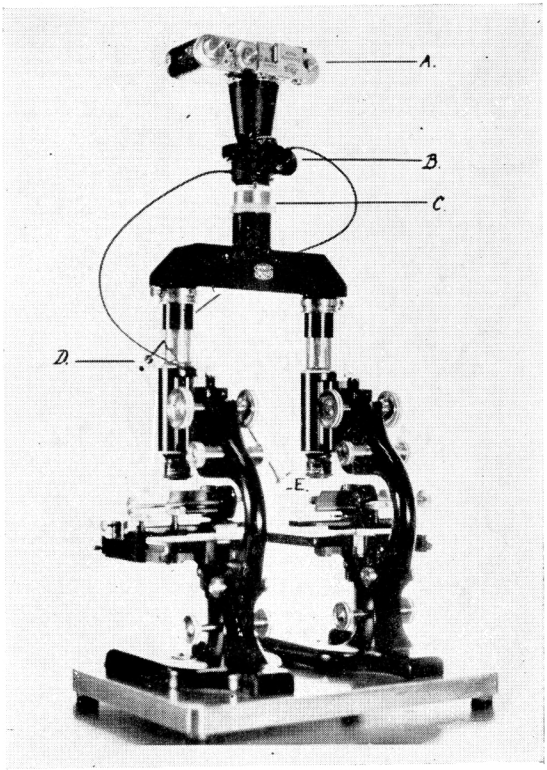
THE TECHNICIAN IN THE POLICE LABORATORY



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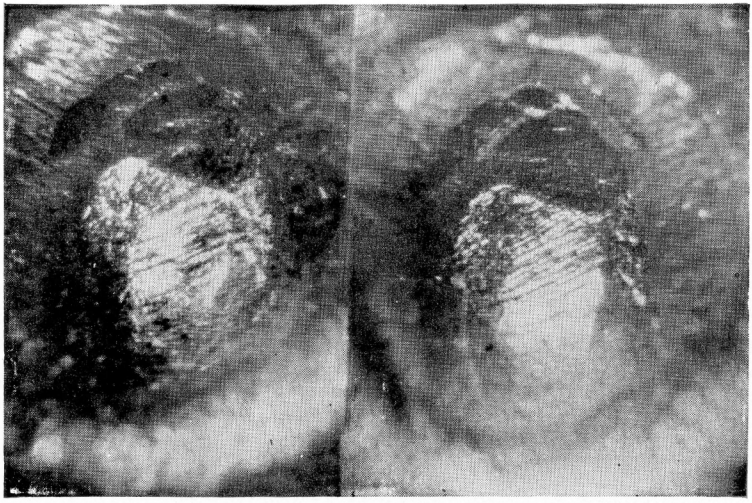

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FIRING PIN IMPRESSIONS

A scientific publication, issued monthly by the Laboratory of the Missouri State Highway Patrol, through the interest and cooperation of police laboratory technicians throughout the country. "THE TECHNICIAN" is a non-profit, and non-copyrighted bulletin, edited by the personnel of the M.S.H.P. Laboratory.

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THE COVER

This month's cover photograph is of a comparison microscope, fitted with the Leica photomicrographic apparatus described in the article submitted by Mr. Davis of the M.S.H.P. Laboratory, and included in this issue. The photograph was taken with a speed graphic, against an illuminated project-screen background.

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THE 3, AMINOPHTHALHYDRAZIDE TEST FOR BLOOD

By David Q. Burd*

Various preliminary or presumptive blood tests have been and are being used by the police technical laboratories of this country. The most common and frequently used are the benzidine, leuco malachite green, phenolphthalein, and Guaiac tests.

We have recently been running some tests with another reagent which, although not new, is to the best of our knowledge not commonly used by police laboratories. This reagent has been mentioned or discussed in several articles in the past but since it is not commonly known we feel justified in calling it to the attention of laboratory technicians who may be interested in it.

The reagent used is 3, aminophthalhydrazide and is made as follows:

0.10 gram	- 3, aminophthalhydrazide
5.00 grams	- sodium carbonate
15.00 cc	- 3% hydrogen peroxide
100.00 cc	- distilled water

This solution is placed in an all-plastic or glass atomizer and sprayed on the article being tested. This is done in a darkened room. If blood is present, even in very minute amounts, it immediately shows up with a bright blue-violet phosphorescence which remains from a half a minute to several minutes depending on the amount of reagent used and blood which is present. This test in no way seems to interfere with the application of other preliminary or proof tests for blood.

When mixed, the reagent will keep for several hours but should be used for testing purposes within a few minutes after mixing since it phosphoresces by itself in a short length of time, although the phosphorescence of the pure reagent on standing several hours is still very weak as compared to its phosphorescence when in contact with blood. Since this does occur it is much safer to use it as soon after mixing as possible, thereby preventing any misleading results.

As in the case of the other preliminary blood tests

this test is not specific for blood. On first trying the test it was at once appa rent to us that an ordinary atomizer, which contains metallic parts, could not be used. The metal reacted with the reagent and the spray itself on leaving the atomizer was strongly phosphorescent. This was overcome by the use of a glass and plastic atomizer. In order to determine what substances, other than blood, would give a positive reaction we tested the following materials:

BODY FLUIDS:

Substance	Reaction
Blood	**
Semen	--
Urine	--
Saliva	--
Perspiration	--

FRESH FRUITS AND VEGETABLES:

Substance	Reaction
Apple (peel)	--
Apple (pulp)	--
Apple (juice)	--
Appricot	--
Banana	--
Boysen berry	--
Carrot	--
Green onion	--
Orange (peel)	--
Orange (pulp)	--
Orange (juice)	--
Pea	--
Pea (pod)	--
Peach	--
Plum	--
Potato (peel)	--
Potato (pulp)	--
Summer squash	**
Tomato	--
Turnip	**

METALS:

Substance	Reaction
Aluminum	—
Brass	**
Copper	**
Iron	**
Iron rust	**
Magnesium	—
Nickel	**
Silver	**
Tin	**
Zinc	—

CHEMICALS:

Whenever a phosphorescence was obtained with one of these chemicals a positive reaction is recorded but in certain instances the color of the phosphorescence was slightly different from that obtained with blood or it appeared for only a few seconds after the application of the testing reagent. Therefore several of the following chemicals which give a positive reaction could be eliminated by comparing the persistence and color of the phosphorescence of an unknown stain with that of known blood.

Substance	Reaction
Aluminum sulfate	—
Ammonium chloride	—
Arsenic acid	—
Barium chloride	—
Barium nitrate	—
Cadmium iodide	—
Calcium chloride	—
Chromium chloride	**
Citric acid	—
Cobaltous chloride	**
Cupric sulfate	**
Ferric chloride	**
Ferrous sulfate	**
Iodine	**
Iodine, Tincture of	—
Lead acetate	**

CHEMICALS: (Continued)

Substance	Reaction
Lead chloride	**
Lead peroxide	—
Magnesium acetate	—
Mercurous chloride	—
Silver nitrate	—
Sodium chloride	—
Sodium cyanide	**
Sodium sulfide	—
Stannic chloride	—
Stannous chloride	—
Potassium cyanide	—
Potassium dichromate	—
Potassium ferricyanide	**
Potassium ferrocyanide	—
Potassium hydroxide	—
Potassium permanganate	—
Zinc chloride	—
Zinc sulfate	—

MISCELLANEOUS:

Substance	Reaction
Gelatin	-
Soap	-

It will be noted that with the exception of the various metals the reagent is nearly comparable to the other preliminary tests, although the same substances do not always give the same results. This list of substances tested is small and many more tests should be run to make it more complete.

At the present time we do not feel that this test by itself is very satisfactory but it does have two distinct uses. The first is that it is a rapid and simple test for searching clothing for blood stains not readily apparent to the eye. The second use is in those cases where there is insufficient material present for the application of any of the proof tests. The technician frequently meets with objects from which he can get positive benzidine tests, although there are no visible stains. In such cases it is not

usually possible to obtain positive Teichmann or Takayama tests.

Any opinion as to whether or not blood is present when based on any single preliminary test is very dangerous and should not be given. If however, several of the various tests, and preferably all of them, are used and they all react positively it is possible for him to state that the stain is probably blood since practically all other substances are eliminated by one or more of the testing reagents.** Each new test that can be developed to eliminate more of the substances which give a positive reaction with the various testing reagents, will make the preliminary blood tests that much more valuable when they alone can be used.

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*David Q. Burd, Chemist and Ballistic Expert for the California State Division of Criminal Identification and Investigation, Sacramento, California. A.B. Degree in Technical Criminology received from the University of California in May 1941. Employed in present capacity since March 1942.

**See "The Preliminary Chemical Tests for Blood" by Ray H. Pinker in the proceedings of the 20th Annual Convention of the International Association for Identification. August 6-9, 1934.

TECHNICAL NOTE

Application of the "crystallography of hemoglobin" to the field of Police Science seems either not to have been made, or at least not referred to to any extent in the literature in this field.

We have noted, with interest, discussions of the subject, photomicrographs of hemoglobin crystals etc. in various texts such as Bodansky's PHYSIOLOGICAL CHEMISTRY, and other medical texts, in which the work of Reichert and Brown is mentioned.

The writer has had no experience in this particular phase of blood examination. However, it would appear that the form taken by the crystallized hemoglobin of the different animals has definite identification value. Possibly, for example, it could be used to indicate probable sources, and hence what precipitin tests might be the most fruitful in certain cases. Other advantages may exist.

If any of our readers has had experience in this phase of blood-work, a report of the methods and procedures, and the value (if any) to the Police Technician would undoubtedly be of interest to many of us. Information as to the conditions under which the crystals are obtainable, effect on their form etc. by contamination, age, etc. and discussion of practical applications would all be worth while.

JED, M.S.H.P.

A PHOTOMICROGRAPHIC ATTACHMENT FOR THE COMPARISON MICROSCOPE

By John E. Davis

Technician with the Laboratory of the Missouri
State Highway Patrol

Except in those instances in which it may be desirable to make very large prints from photomicrographic negatives, the 35 mm. film will generally be found to be quite satisfactory. In spite of possible loss in fine detail during the enlarging process, the speed, convenience, and degree of control which may be exercised in the use of this film generally more than make up for any disadvantages which may be associated with it.

We have in our laboratory a number of photomicrographic units, among which is the "Micro-Ibso attachment manufactured by Leitz, and intended for use with the Leica camera. The Micro-Ibso adapter is shown in the photograph on the cover of this issue. The device is intended for use with the ordinary monocular microscope, and consists essentially of a conical tube which is screwed into the camera lens position after removal of the latter, a shutter mechanism below this, and a prism and viewing telescope for focusing. Light leaving the ocular of the microscope strikes the prism and is reflected into the telescope marked "B" in the photograph, where the field may be sharply focused. Cross hairs in the telescope provide for sharp focusing of the view on the negative regardless of differences in the eyes of different observers. The cable release marked "D" in the photograph controls the shutter mechanism, while that of "E" moves the pri completely out of the path of the light rays while the negative is being exposed.

For use, the camera is set on "time", and the shutter opened. Exposure time is then controled by a mechanism on the attachment itself.

This apparatus has been in use in this laboratory for some time, and has proven most satisfactory and convenient for the taking of photomicrographs both in monochrome and in color.

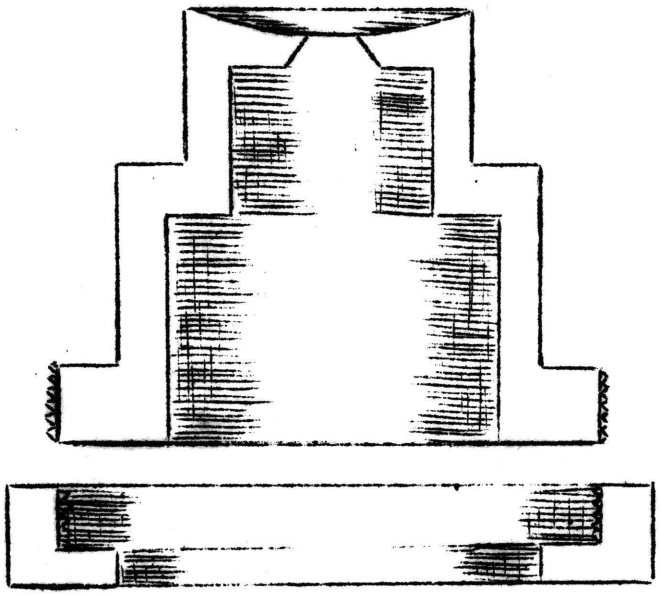
For bullet examinations, the laboratory is equipped with a Spencer comparison microscope as illustrated in the photograph. A 5 x 7 photomicrographic apparatus (Spencer) has been used exclusively for reproducing the field of view through this instrument, with excellent results. However, it naturally occured to us that the 35 mm. camera, if adapted to use with the comparison microscope would have certain advantages not obtained with the larger negative. Disadvantages to the use of 5 x 7 inch negatives with the apparatus used were (1) Difficulties involved in focusing the field on the ground glass, even with the aid of a special magnifyir view lens. (2) Difficulties in getting both halves of the field in focus simultaneously, and properly aligned at the same time. (3) The long exposures necessitated (often running from 15 to 30 minutes), and (4) time consumed in making the exposures, loading and developing film etc before the results could be observed.

Advantages to the 5 x 7 inch negative are primarily: (1) better rendition of fine detail, (2) larger prints possible, allowing more cropping, (3) relatively slight amount of grain in the enlargements.

By use of 35 mm. film, and the Micro-Ibso attachment, the disadvantages associated with the 5 x 7 inch negative would be obviated. On the other hand the advantages associated with the 5 x 7 inch negative would be lost in the use of 35 mm.

Considering these factors, and the fact that we had the Micro-Ibso attachment in our laboratory, it was decided to make an adapter which would permit attachment of the Leitz instrument to the Spencer comparison microscope. The shape and size of the eyepiece in the cross-bar of the instrument was such as not to permit a direct attachment of the Micro-Ibso and Leica to the ocular. Accordingly an adapter was designed which would fit down over the Spencer ocular, and onto which the Micro-Ibso collar would rest. This adapter was then turned out of bronze, and fitted to the instrument. It is shown in the illustration at the point "C", and in the diagram on the following page in cross-sectional form. The lower collar slips up onto the Spencer eyepiece from below (after first being removed from the cross-bar) and is threaded on the inside to fit the adapter which is fitted from above. The collar is knurled for convenience in attaching. Owners of the Spencer instrument as illustrated will recall that a separate spring-fitting collar with a diaphram

is slipped over the eyepiece when in use. The diaphragm is ordinarily about a quarter of an inch above the eye-lens. Accordingly, a similar (though slightly smaller) diaphragm was turned into the bronze attachment made for the instrument.



The next step was naturally a trial test of the adapter. The bronze had not been blacked, and it was feared there might be some internal reflections introduced into the system. Other fears were expressed as to the probable loss of fine detail and the probable graininess of large prints.

Generally speaking we use only panatomic-X photomicrographic work. This both in the 5 x 7 inch film and 35 mm.

Two test bullets were placed on the stage, and carefully aligned through the eyepiece. The attachment was then fixed in place on the adapter, and the field of view carefully adjusted as to lighting and focus. Exposure was in this instance made on Plus-X film rather than Panatomic-X, in order to emphasize graininess, and to reduce the exposure time. Exposures of 5, 10, 15, 20, 30, and 60 seconds were made with the lighting arrangement and field of view of such a nature that an exposure on panatomic-x 5 x 7 film would probably have been between 15 and 25 minutes long. All of the negatives were excellent, except that they ranged from light to overly dark. Exposure of 15 seconds was about right.

The film was dried and enlargements made. The 8 x 10 enlargment, while it did show grain when closely examined, was not so grainy as had been expected. Further, some cropping was done, which meant that the effective enlargment was greater than that which would, in a straight 8 x 10, have been obtained. 5 x 7 inch prints were quite satisfactory and not noticeably grainy. Detail was quite good.

As a result of these tests it seems that utilization of 35 mm. film with the comparison microscope is not inadvisable to say the least. The saving in time, the convenience of multiple exposures, the ease of handling the film, and the quality of the results more than make up for the disadvantages involved. In certain instances it would undoubtedly be better to use the larger film to reproduce certain fields of view and to allow for cropping in the enlargement. It is this writer's conclusion, however, that those departments which have these two instruments on hand would do well to utilize them in this manner, if they have not already done so.

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TECHNICAL NOTE

For some reason or other it is at times difficult or impossible to get a positive reaction in the Florence test, even in the presence of an extract of a known seminal stain. In many of these instances it is possible to increase the sensitivity of the reaction by a method sometimes followed in this laboratory. An extract of the stain is made with distilled water as usual, and then the slide placed in the ice chamber of a refrigerator until the specimen freezes. It will begin to melt almost immediately upon removal, at which time the reagent (Florence or Wagner's) is added to the edge of the melting ice. Crystals will form almost at once.

This procedure has the advantage of precipitating the crystals where they might otherwise be unobtainable, but the disadvantage of producing, at times, atypical crystals. These atypical crystals may be in the form of the standard ones, but with a single plate or "shark-fin" extending out from one side. Feathery plates of this type may also form independently. Control tests with and without seminal extracts may be used for comparison if there is any doubt as to their identity.

JED, M.S.H.P.

A METHOD TO ASSIST IDENTIFICATION OR ASSOCIATION OF RIM FIRE CARTRIDGE CASES WITH A PARTICULAR FIREARM*

By Corporal A. Mason-Rooke
Royal Canadian Mounted Police,
Scientific Laboratory, Regina, Saskatchewan.

(Previously undisclosed in the literature by the writer)

Methods used by firearms examiners to determine whether or not a given cartridge case was discharged or in any manner associated with a particular firearm entail the comparative microscopical examination of the markings imprinted on a given cartridge case with those markings imprinted on cartridge cases known to have been discharged in or connected with the particular firearm.

These markings on a cartridge case are imprinted on those portions that are brought into contact with various parts of firearm when discharge takes place. They are the result of numerous small irregularities present on the contact parts of the weapon which leave impressions on the cartridge case.

Consequently the greater the number of places on a cartridge case where such markings can be found the easier becomes the task for the examiner to arrive at a definite conclusion.

It is noted that writers when dealing with the subject of cartridge case identification have neglected to draw attention to a locality on rim fire cartridges where it is often possible to find markings imprinted by a part of the firearm they have been discharged in, or associated with.

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* Reprinted from the June 9, issue of the "ROYAL CANADIAN MOUNTED POLICE GAZETTE" by permission of the editors of that bulletin.

This place is the forward edge of the rim of such cartridges at a point directly in front of the firing pin impression.

When the firing pin strikes the rim of such a cartridge, the forward edge of the rim in front of the firing pin is driven sharply against a portion of the cartridge head recess at the breech chamber of the weapon till the subsequent ignition of the priming compound and propellant powder takes place.

The brass or copper material of the cartridge case, being softer in composition than the steel of the firearm, causes minute irregularities present on this part of the weapon to be imprinted on the cartridge case.

Many rim fire weapons, however, are not constructed with a cartridge head recess. In such cases the forward edge of the cartridge rim is driven against the outward face of the breech chamber, and as a result frequently receive the imprint of quite prominent and distinctive irregularities from this portion of the firearm.

The construction of these portions of a firearm may be one of several different types of steel cutting or more properly described, steel tearing, operations. This obviates the possibility of any two weapons imprinting identical markings to cartridge cases. Hence the value of the markings for identification purposes is apparent.

Reasons for small variations in the intensity and number of these markings from one cartridge case to another when both have been stamped by the action of the firing pin in the same firearm are dependent on the following factors:-

(a) The hardness of the cartridge case material.
(b) The striking force of the firing pin.
(c) The nature and quantity of the priming compound at the locality mentioned in the rim of the cartridge.
(d) The presence of dirt and rust in the cartridge head recess or on the face of the breech chamber.

Attention is directed to the fact that whether the cartridge is discharged or has misfired is not an influential factor in this method of identification. It was used to good advantage in a recent case to determine whether a misfired cartridge had been connected with a particular firearm.

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TECHNICAL NOTE

This Department recently had occasion to investigate a murder in which the lethal weapon was a .351 caliber Winchester Rifle. The bullet recovery box available in the laboratory was designed for small arms and was of insufficient length for the recovery of rifle bullets. After several methods had been tried, unsuccessfully, to recover the bullets, it was decided that it would be necessary to construct a bullet recovery box especially for rifles.

The box was constructed of pine boards one inch thick, twelve inches wide and twelve feet long. The construction was the same as the conventional bullet recovery box; a circular opening in one end to fire into and the lid hinged on one side and fastened with window catches on the other, permitting access to the interior.

Rifle boxes may be constructed much shorter than twelve feet. However, ordinarily in these boxes it is necessary to use a considerable portion of the cotton waste wet, rather than dry. The use of wet waste necessitates the use of a waterproof box as the regular wooden box will warp and crack to the extent that it will become useless.

The .351 Winchester Rifle when fired into the box, penetrated approximately seven feet. Later a .30 caliber Springfield Rifle, using service ammunition, was fired and the bullet recovered after penetrating approximately nine feet.

The use of the box twelve feet long will give a good margin of safety for practically all of the rifles that are examined by a firearms identification expert.

PRI M S U P

TECHNICAL ABSTRACTS AND NOTES

This section is devoted to a listing of abstracts and notes appearing in other journals, which may be of interest to technicians.

(1) "Detection of Blood by Means of Chemiluminescence", by Proescher and Moody. Journal of Laboratory and Clinical Medicine, 24: Page 1183, August, 1939.

(2) "Notes on the Identification of Seminal Stains by Means of the Florence Reaction", by Joseph Beeman, M.D. Archives of Pathology, Vol. 34, PP. 932 and 933, November 1942.

A reprint of the second article listed above was sent us by the author, and indicates that in his experience Florence reagent gives gross amorphous precipitates with aqueous extracts of tissue, feces, lipoids, and dried milk, but that the typical Florence crystal has not been observed with these, nor with old lecithin, dried egg yolk or white, nasal or vaginal mucus, serum, sweat, gonorrheal pus, wine, whisky, beer, or ice cream residues. Male urine containing sperm cells is reported to have given a positive reaction, whereas urine specimens lacking spermatozoa fail to give positive reactions.

(3) "Acute Sodium Fluoride Poisoning", by Wm. Lidbeck, M.D., Irvin B. Hill, M.D., and Joseph K. Beeman, M.D. Journal of the American Medical Association, March 13, 1943, Vol. 121, pp. 826 and 827.

THE EFFECT OF RUST UPON THE IDENTIFICATION OF FIRED BULLETS

By Ray B. Jenkins
Firearms Examiner with the
Laboratory of the Missouri State Highway Patrol

There has been published a quantity of material on the identification of bullets fired from different types of guns, of the methods followed, and the factors upon which such identifications are based. Mention has been made also, from time to time, of comparisons of bullets fired from "matched guns", firearms bored and rifled with the same tools, etc. On the other hand, practically nothing has been said regarding the effect on the identification possib.ilities of projectiles fired from arms subjected to various treatment such as rusting, excessive heat, chemical corrosion, etc. This is particularly noticeable in view of the relative frequency with which rusted and corroded small-arms are submitted to the firearms examiner for identification purposes.

The first instance in which we had occasion to actually run a series of control tests on such a gun occured only recently.

Officers had been informed that a .38 caliber Colt revolver had been found, which might have been connected with a bank robbery which had occurred some time before. The gun had been found in the woods, and apparently had lain there for some time, for when submitted to the laboratory it was found to be quite rusty and corroded. The barrel and cylinder were rusty both inside and out, and the general condition of the gun was poor.

There were submitted no questioned bullets for identification. However, the condition of the gun suggested that it would lend itself well to experiments designed to determine the effect which rust and corrosion would have on bul-

lets fired in it subsequent to that rusting.*

It was also thought that cleaning of the gun might have some effect on the striations produced on the bullets. Accordingly, the experiments were conducted in such a manner as to indicate whether or not this would be the case.

To facilitate the comparison, all cartridges were marked, both on the bullet and cartridge case, before being placed in the cylinder, in order that they would all enter the chamber in the same manner.

Only one chamber of the cylinder was used, the cartridges being placed consecutively in it for firing.

Experimental test shots were fired, with the condition of the bore as indicated below:

(1) Bore, cylinder, and breech face in the same condition as when the gun was received.
   (a) Shots 1 through 5 were fired and bullets and cases numbered in that order.

(2) The gun was then cleaned with a fiber-bristle brush and Hoppe's No. 9 cleaning solution.
   (a) Shots 6 through 10 were fired and the bullets and cases so numbered.

(3) The gun was cleaned with a brass-bristle brush, and Hoppe's cleaning solution, followed by a cleaning with the fiber-bristle brush, and a final swabbing with cotton patches.
   (a) Shots 11 through 15 were fired, and the bullets and cases marked accordingly.

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*The practical application of this determination would not be so great as if it had been possible to compare these test bullets with others fired before rusting occurred. In this particular case, inasmuch as no previously fired projectiles were available, that determination was not possible. It is our intention to continue these experiments, firing test bullets from small-arms, subjecting them to various treatment, and then comparing those bullets with others fired after the induced rusting, corrossion, etc. has been effected. Results of these experiments should have definite practical value, and will be reported in "THE TECHNICIAN" in the interest of other technicians.

These bullets and cases were then carefully examined under the comparison microscope, and attempts made to obtain matches between the various shots of the series.

Results of the comparisons are presented below, in tabular form. In each case, the best match obtainable was used as a basis for the conclusion presented under "results".*

NUMBER OF BULLET	RESULTS
1 and 2	No identification made
2 and 3	Good identification
3 and 4	Good identification
4 and 5	Good identification
5 and 6	Poor identification - some land and groove markings beginning to show.
6 and 7	Fair identification
7 and 8	Good identification
8 and 9	Good identification
9 and 10	Good identification
10 and 11	Fair identification
11 and 12	Good identification
12 and 13	Good identification
13 and 14	Good identification
14 and 15	Fair identification
1 and 15	No identification made
2 and 15	Poor identification
3 and 15	Very poor identification
4 and 15	Fair identification
5 and 15	Very poor identification
6 and 15	Good identification
7 and 15	Fair identification
8 and 15	Poor identification
9 and 15	Fair identification
10 and 15	Fair identification
11 and 15	Fair identification
12 and 15	Good identification
13 and 15	Excellent identification
14 and 15	Fair identification

The results of this examination would seem to indicate the possibility of the identification of bullets fired from a rusty gun. However, this would depend considerably upon whether the shots were fired consecutively, as rust particles, and foreign matter which may be marking the first few bullets will be removed by them in their passage through the bore. Bullets fired after the first two or three should be more consistent in their markings, and show less variation in appearance. The results of the second series of examination show, however, that the markings are still not consistent enough to assure identification when several shots are fired. There appears to be some alteration in the bore of the gun with each successive shot in this series, and is such as to reduce the possibility of obtaining a satisfactory match with bullets which might be subsequently fired.

Comparison of the bullets of the first and second series, interestingly enough, gave no particular indication that the cleaning of the gun with brush and solvent, had any effect on the striations being produced. Comparison of the second and third series similarly failed to indicate any noticeable effect due to the cleaning. While it is probably that some slight change would be effected by the cleaning, the major change is obviously due to the passage through the bore, of the bullets themselves.

The actual amount of change which might be expected in a case of this type would probably depend on the extent to which the bore had rusted (the thickness of the rust layer, as well as its character otherwise -- hardness, etc.). The number of shots which might necessarily be fired before a definite and consistent pattern began to appear would probably depend on the same factor.

Comparisons of the cartridge cases was made in a similar manner. The results follow:

NUMBER OF SHELL	RESULTS
1 and 2	Good identification
2 and 3	Good identification
3 and 4	Good identification
4 and 5	Good identification
5 and 6	Good identification

NUMBER OF SHELL (Cont'd.)	RESULTS
6 and 7	Good identification
7 and 8	Fair identification
8 and 9	Fair identification
9 and 10	Fair identification
10 and 11	Very good identification
11 and 12	Very good identification
12 and 13	Very good identification
13 and 14	Good identification
14 and 15	Good identification
1 and 15	Good identification
5 and 15	Good identification
10 and 15	Very good identification

The above examinations were made not only on the various markings of the breech facing, but also on the marks produced by the firing pin, which was of a peculiar shape.

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*The conclusions reached under "results" in the tables are based on the examination of the entire circumference of the bullets. While the photographs reproduced elsewhere in this issue may not seem to bear out these results, it should be remembered that the photographs show only a small portion of one side of the bullet.

The term "identification" as used in this article does not imply that an identification of that quality in a criminal case would be accepted in the laboratory as an actual and positive identification. In fact, had these bullets not been marked before being placed in the gun, probably some of these matches -- even of the quality shown, would not have been obtained. Thus, the term "identification" may, in some instances mean that the quality of the comparison was as designated, and, under the circumstances of the experiments it could be considered as an "identification".

NOTE: The identifications were photographed with the comparison microscope - Micro-Ibso attachment and Leica camera described elsewhere in this issue, and pictured on the front cover. Eastman Panatomic-X film

was used. Exposure time was one minute.

The photographs on the inside of the back cover refer to the examinations made in tables one and two, on the examinations of the bullets. The photograph on the inside of the front cover is a reproduction of the firing pin impressions of cartridges numbered 13 and 14.

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A Letter to the Editor:

Last month we printed a letter from one of our readers, which offered comment on the article on Seminal Stains which appeared in the May issue of "THE TECHNICIAN". A reply was made to that letter on June 7. This letter is presented below, as is the final answer to it. We are including copies of these letters for the interest of our readers mainly because we feel that they indicate much as to the "thought processes" of different men in the field. From a purely scientific standpoint--or a literary standpoint--they may offer less. Comments received, and sent, in letters are in many respects more interesting than articles submitted primarily for publication. These views and expressions may well be made available to other technicians, if a true spirit of interest and cooperation is to be maintained between us.

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M.S.H.P. Lab.
June 7, 1943

Dear Sir:

* * * * *

Your letter commenting on the article on Seminal Stains would undoubtedly be of interest to other readers. May we print it in the June issue?

As to your comments themselves, there can be but little or no criticism. I thought the comments fully justified. However I do wish to make a few remarks relating to the subject in general.

It seems to me that one of the best methods of bringing facts to the attention of the persons working in a particular field is in the "round table" type of discussion wherein all sides to a question are expressed in a manner likely to result in a mild sort of "controversy". I do not mean that there should be an argument, nor an establishment of two or more "schools of thought", nor should any publication, as such, take sides in the issue in

question.

Actually there were two main reasons for including that article in "THE TECHNICIAN".

In the first place, there was actually some doubt in my mind as to the reliability of such conclusions as have been advocated as valid under those circumstances. And, to be frank, there is still some doubt in my own mind. I agree that in presentation of court testimony that the expert should state the facts and let the jury decide the importance of it. On the other hand the expert is often asked--either by the prosecution or the defence, "Just what significance do you attach to the observation or results of your test?" Or he may be asked "Just what is your opinion, as a technician familiar with this type of evidence, in this case?"

You would undoubtedly reply that it was your opinion based on the nature of the test-results, that semen might be present, but that beyond that you had no conclusion."

In my own case, if asked that question, I might possibly reply that although there was no proof of the presence of semen, that I felt in my own mind that it was present.

For instance, in the examination of suspected seminal stains, if all preliminary tests run are positive, it is usually my personal opinion (as an <u>individual</u>) that seminal stains are present. As a technician, on the other hand, I am aware of the accepted inconclusive nature of preliminary tests. Suppose we consider the expression of <u>opinion</u> which is now permissable. It is obvious that I can not state that semen is actually present. I therefore state the fact that it may be present. May it not be my opinion that it is? If so am I in error to express such an opinion if asked to do so?

You will note here a tendency to allow the existence of a double type of opinion--namely that opinion which I have as an individual, and that opinion which I have as a technician. The latter would be nothing more than a factual (non opinion) conclusion of a rather inconclusive nature, and accordingly seems to me not really to be opinion.

Opinion, it seems to me could only be offered from my ability as an individual with technical training and experience, to draw an opinion-conclusion from the facts observed. Your statement that "semen may be present" is a fact, not opinion. What would you say if asked for an expression of opinion--could you honestly say that you had no opinion? It is rarely the case that I am unable to form some sort of an opinion from the observations I make. It is hardly possible to even think without forming opinion-conclusions about things. True, you could say "it is my opinion that semen may be present". Possibly this should be the statement made regardless of a man's opinion as an individual. If indeed you will grant justification for having such two separate "opinions".

The second factor brought up was as to whether or not it was permissable to consider preliminary tests for semen as more valid than they had previously been considered as indicating proof of presence of these stains.

It was, and still is to some extent, my feeling that they do have somewhat more significance than is attributed to them. Obviously this is the case or I would never have any opinion that a stain was semen without isolation of sperm cells. It was of interest from my own personal standpoint, to find out what others thought about the matter. Hence the article. I know that some technicians consider the Florence test as a proof test by itself. I do not. To me their conclusions seem unjustified and unwarranted altogether as being incomplete. No doubt your reaction to my ideas are similar, and I can understand that attitude.

Respectfully

John E. Davis

June 10, 1943

Mr, John E. Davis
Missouri State Highway Patrol Laboratory
Jefferson City, Missouri

Dear Mr. Davis:

Acknowledgment is made of your letter of June 7th.

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I am very much gratified to know that you, like myself, believe that the round table types of discussion are most productive.

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Getting back to the problem of seminal stains, first I should like to point out that on being asked "Just what is your opinion, as a technician familiar with this type of evidence, in this case?", the technician may answer in several different manners. He may state that due to his vast experience, location of the stain, odor of the stain and positive preliminary test, he believes, or he thinks, or he is of the opinion that the evidence stain is a seminal fluid stain. However, he must be prepared to answer the question "Is there any other substance which will give identical reactions as those obtained by you in the examination of the evidence?". Here the truthful answer would obviously be "Yes" because there are many bodily secretions which may give rise to identical reactions. However, this is the exact analysis of the furthest advance into the identification of seminal fluid other than by isolation of the sperm cell. As yet, no one is definitely able to establish seminal fluid without finding the spermatozoa because most of the workers report that the other bodily secretions will react in like manner. If you should have occasion to do any research work on this I would be very much interested in your results as to the reaction of the Florence reagent with other secretions such as urine, nasal discharge, pus, etc.

In the above paragraph I attempted to differentiate between opinion and conclusion. Conclusion is sometimes defined as "A conviction from inference". In logic it is defined as "A proposition the truth of which is inferred from a premise or premises; especially, the third proposition of an Aristotelian syllogism", while opinion is defined as "A conclusion or judgment held with confidence, but falling short of positive knowledge". In strict accordance with these definitions, you must admit that testimony of the expert on seminal fluid stains, when isolation of the spermatozoa is lacking, can only result in an opinion. As soon as the spermatozoa is seen microscopically, then his testimony becomes conclusion.

This leaves us with a very peculiar dilemma. In cases of azoospermatic males, no spermatozoa is found in the seminal fluid. What then can the technician conclude in such cases. Under our present methods of analysis he is very definitely limited to opinion and not conclusion. From a strict logical standpoint, I disagree with you that a statement "Semen may be present" is a fact. Probabilities cannot be considered fact. A thing must be actual to fall within the realm of factuality. However, that is digression from the point in question.

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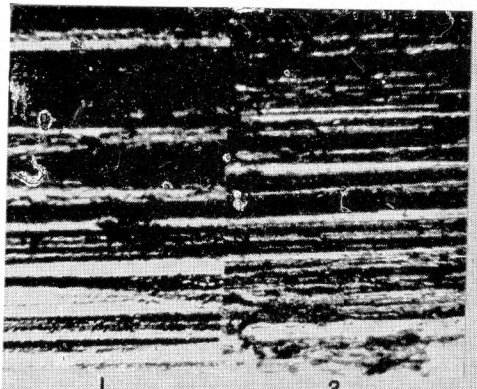
Sincerely yours



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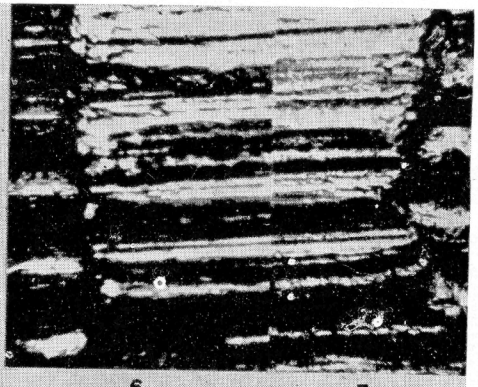

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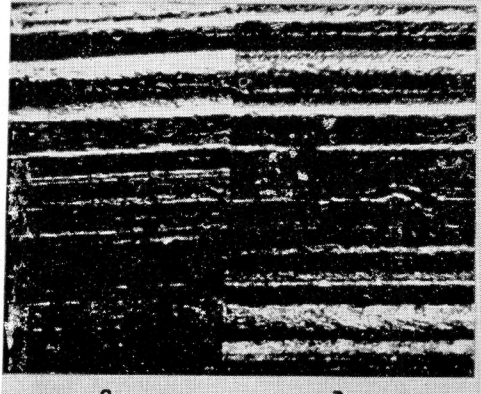

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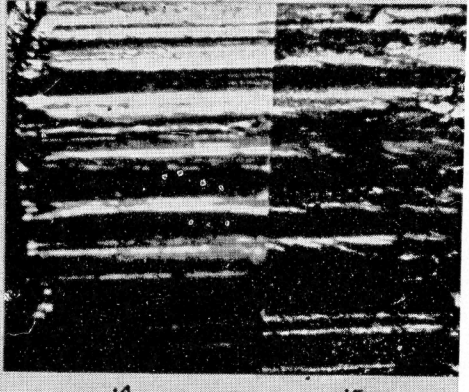

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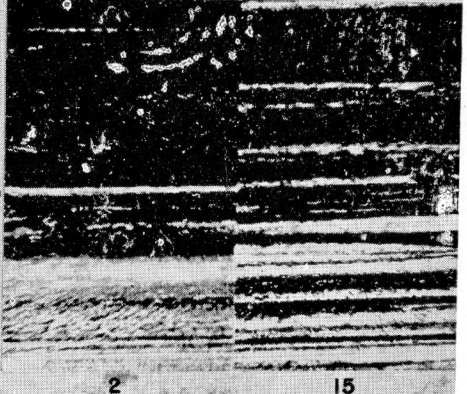

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