

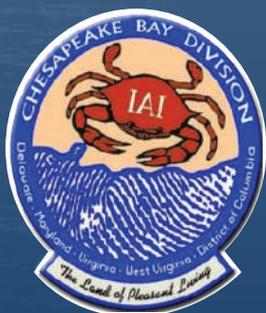
The Official Publication of the Chesapeake Bay Division of the
International Association for Identification

CHESAPEAKE

E X A M I N E R



20 Years
1998 - 2018



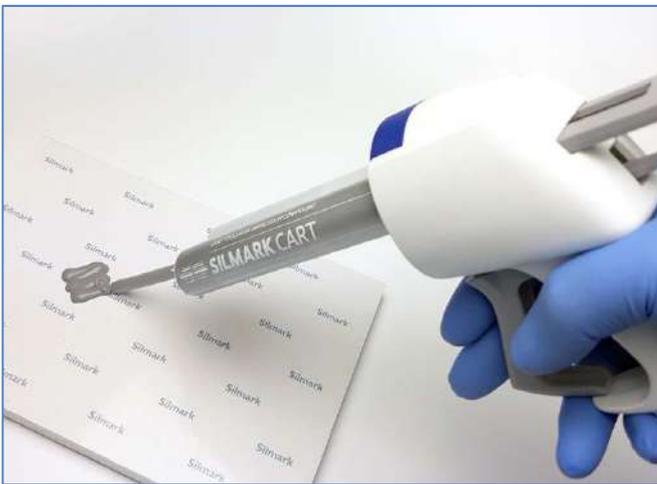
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SILMARK CART



2 component silicon compound for casting of tool mark impressions

SILMARK CART is a 2 part room temperature addition curing silicone with a short setting time and high viscosity. It is especially formulated for use in a cartridge and is used with a dispensing gun.



The grey and brown colored silicon material is available in two versions: a standard version and a version which is meant for use at lower temperatures called **SILMARK CART WINTRY**. The Wintry versions have shorter setting times at lower temperatures, see table for details.

SILMARK CART comes in 50 (1.69 fl.oz) or 75 ml (2.54 fl.oz) cartridges.

SILMARK CART Standard versions

Temperature	Processing time in minutes	Setting time in minutes
14° F / -10° C	5:20	32:00
32° F / 0° C	2:40	16:00
50° F / 10° C	1:20	8:00
68° F / 20° C	0:40	4:00
86° F / 30° C	0:20	2:00

SILMARK CART WINTRY versions

Temperature	Processing time in minutes	Setting time in minutes
14° F / -10° C	1:20	8:00
32° F / 0° C	0:40	4:00
50° F / 10° C	0:20	2:00
68° F / 20° C	0:10	1:00
86° F / 30° C	0:05	0:30

Actual temperature silicon material 20° C/68° F

SILMARK CART and auxiliary products

Cat. no.	Description
C-1105	Silmark CART Grey, 75 ml
C-1106	Silmark CART Grey, 50 ml
C-1005	Silmark CART WINTRY Grey, 75 ml
C-1006	Silmark CART WINTRY Grey, 50 ml
C-2405	Silmark CART Brown, 75 ml
C-2305	Silmark CART WINTRY Brown, 75 ml
C-8200	Dispenser gun
C-8300	Static mixing tips, 50/p
C-8350	Spreader tips, 50/p
C-8110	Silmark CART kit, comprising: 2x Silmark CART Grey, 75 ml 1x Dispenser gun 10x Static mixing tips



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Message From The Editor

Greetings fellow members and friends,

Thank you for allowing me to continue serving as the Chesapeake Bay Division IAI's Editor. It has truly been an honor and a privilege to continue in this position. I'd like to thank all of the members of the Editorial Committee for all their efforts this year - I couldn't have done it without you.

The CBD-IAI's goal with the Examiner is to promote further education, forensic training, encourage research, share recent advancements and developments within the field, and to foster growth within the forensic science community. As Editor, I will continue to do my best to uphold these goals.

If you are interested in submitting content and/or an advertisement in future editions, please contact me with any questions you may have. I am always happy to help.

Kelly Peak, Editor



DISCLAIMER: The Chesapeake Examiner is the official publication of the Chesapeake Bay Division of the International Association for Identification. The views and opinions expressed in the articles which are published in the Chesapeake Examiner are exclusively those of the writers and/or publications from which the information was taken and do not necessarily reflect an endorsement or position of the CBD-IAI or its membership. Permission to reprint original material published in this journal may be obtained by contacting the current Editor. An electronic copy of the material will be provided with the understanding that the appropriate authorship, article title, publication, volume, and issue information be included in the reprint. Submitted articles may contain the use of equipment or processes utilizing chemicals or combinations of chemicals which may be hazardous or potentially hazardous to the user's health. It is strongly recommended that all directions for equipment be read and followed and that appropriate precautions be exercised when using hazardous or potentially hazardous chemicals or combinations of chemicals wherein the hazards may not be fully known. The CBD assumes no responsibility for use of equipment, chemicals, or combinations of chemicals as set forth in any article.

PRESERVE & PROTECT



Latitude Fentanyl Filtered Hood



Ductless Fume Hoods

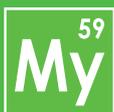
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Letter from the President

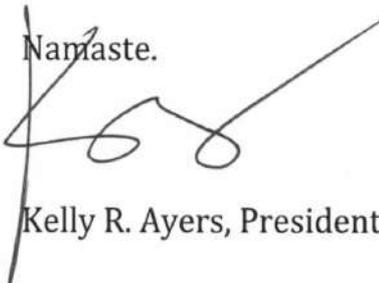
As I write this, my brain is swarming with questions of whether I've bought all the food I need, whether I've purchased all the gifts, and whether I've caught up at work enough to take some time off! As we all move at a frenetic pace through the holidays, I hope that we can also find time for ourselves to create joyous memories and peace of mind. If you're reading this, you've survived!

Speaking of things moving at a frenetic pace...I am finding it difficult to believe that I am already coming to the end of my tenure as the 56th CBD IAI President. Since being sworn in, I was able to attend conferences for the Rocky Mountain Division, the International Parent Body, and the Florida Division and felt privileged to be able to represent our division at each. Our upcoming conference in Morgantown, WV will be the one that I will remember! Officers and committees are working hard to make this an educational and networking opportunity that you don't want to miss. The agenda is filled with exciting presentations and engaging workshops. Register early to be sure you have a seat in the workshop of your choice!

As we celebrate 20 years of forensic science at West Virginia University, I invite alumni back to campus to see how the program has evolved. It is critical that alumni get to know one another and to serve as mentors to the current students. I expect a large student turnout and that makes my heart happy...they are the future of this organization! To the students: become members, become involved, and make this the strongest division of the IAI!

May your 2018 be everything you want it to be and I hope to see all your smiling faces in Morgantown!

Namaste.



Kelly R. Ayers, President



Division Officers & Board Members

Division Officers

President - Kelly Ayers
1st Vice President - Chris Claytor
2nd Vice President - Shelly Brazelle
3rd Vice President - Danielle O'Neill
Secretary / Treasurer - Jessica Landi
Editor - Kelly Peak
Sergeant at Arms - Lanette Turner
Historian - Sarah Dwyer
Webmaster - Da-il Kim

Board of Directors

Rebecca Wood (Chairperson)
Kelly Ayers (President)
Francis J. Curran, III
Amanda Lane
Mallory McCormick
Gabrielle Toy
Jessica M. Shaffer



Fall 2017 Seminar Richmond, VA

Chesapeake Bay Division: International
Association for Identification

FALL 2017
SEMINAR



Education is one of the CBD-
IAI's primary missions. The
CBD-IAI strives to be
the main professional
association for those
engaged in forensic
identification,
investigation, and
scientific examination
of physical evidence.



October 21, 2017
Richmond Police Dept.
Training Academy
Richmond, VA

1202 W. Graham Road
Richmond, VA 23220

Parking: On Site (FREE)

<http://www.cbdi.ai.org>

If you are interested in presenting or have
any additional inquiries, please contact:

Chris Claytor, 1st Vice President

Claytorca@gmail.com

434-760-0804



Fall 2017 Seminar



Richmond, VA
Richmond Police Department's
Training Academy
1202 W Graham Road, Richmond VA

This year, the Chesapeake Bay Division of the International Association for Identification held the one day Fall Seminar at the Richmond Police Department's Training Academy. The Fall 2017 Seminar had several presenters representing a variety of agencies and organizations, making it a huge success.

The CBD-IAI thanks all the members, sponsors, and the Richmond PD for their participation and continued support.



Board of Directors Meeting

Frederick, MD
April 20, 2017

Attendees:

Jeff Barnes, Frank Curran, III, Jessica Shaffer, Shelly Brazelle, Rebecca Wood, Kelly Ayers, Jessica Landi, Chris Claytor, Lanette Turner, Mallory McCormick, Les Michel

1. Call to Order – President Rebecca Wood

Rebecca Wood called the meeting to order at 10:07 am at the Clarion Inn in Frederick, MD.

2. Roberts Rules of Order

Motion by Jessica Shaffer, seconded by Frank Curran, III, to waive Roberts Rules of Order, no discussion, motion carries.

3. Board Meeting Minutes from Previous Year Board

Unanimously accepts.

4. Old Business

Destroying recordings of meeting minutes (if there is written copy)

Motion made by Rebecca Wood, that if we have cassette tapes of both business and board meetings that have been converted into a written record, that the cassette tapes can be destroyed. Seconded by Jessica Shaffer. Discussion took place. Vote passed unanimously.

Motion made by Rebecca Wood, if we have digital files of both business and board meetings that have been converted into a written record, that the digital file can be destroyed. Seconded by Jessica Shaffer. Discussion took place. Motion passed unanimously.

5. Secretary/Treasurer Report

Secretary/Treasurer Jessica Landi provided account balance totals (as of March 31, 2017), profit and loss statements from the previous Spring Educational Conference / Fall Seminar and certification funds received from the IAI for passed exams.

The change in active membership numbers and geographical locations of the membership were presented. All information was reviewed; no additional discussion took place. Accepted by the board.

6. Officer Reports / Committee Reports

President Rebecca Wood

Currently there are 96 attendees registered for the conference and the CBD has successfully met its' room block. Therefore, the CBD will not have to pay any additional fees for the meeting space. Rebecca is working with the venue to ensure all attendees are under the room block.

1st Vice President – Kelly Ayers

Proposed venue – Morgantown Marriott at Waterfront Place April 27 – 28, 2018. Next year is going to be the 20th anniversary of the Forensic Science program at West Virginia University. This will attract a large amount of the alumni from all over the US. Possible keynote speaker: Nancy Grace. Kelly will use this year's conference to continue to work on planning next year's spring educational conference. Kelly provided information to the Board in regards to the venue and discussed the initial contract that was provided. After a brief discussion, it was decided that Kelly will speak with the potential venue and get answers to some additional questions. Once the answers are received, the Board will vote. This will be addressed at a future time and date. Board recommended that Kelly draft a letter stating that WVU will in no way receive any compensation for potentially partnering with the CBD for this conference.

2nd Vice President – Chris Claytor

Potential venue for the 2017 Fall Seminar: Richmond Police Training Division.

The Richmond Police Training Division has agreed to provide the seminar space free of charge and this includes a break out room for a lunch session. Chris spoke with Captain Powers and is awaiting potential dates that the seminar can be held. Once these dates are received, this information will be provided to the Board for vote. Sponsorships that will be needed include: breakfast, lunch and vendor break. Up to 20 free registrations will be given to the members of the Richmond Police Training Division. Chris will be reaching out to local businesses for possible donations and discounts on food and beverages.

Potential Venue for the 2019 Spring Educational Conference: Sheraton Four Points Midlothian

Initial contract was provided to the Board from the Sheraton Four Points Midlothian in Richmond, VA for the 2019 spring conference. All aspects of contract were reviewed and feedback was requested within 30 days. Once feedback is received from the Board the concerns will be addressed with the venue. Final contract will then be sent out for a vote. Chris is also working with the Richmond Region of Tourism to provide free advertising on attractions in Richmond, VA.

3rd Vice President – Shelly Brazelle

Potential venue for the 2018 Fall Seminar: Stevenson University.

Twelve vendors will be joining us in Frederick for the conference (\$2,550 from tables). Total sponsorships total \$5,000 (President's Reception, Hospitality Suite, Student Lunch, Speaker Travel Costs and Afternoon Breaks). Three vendors paid for fliers and five paid for Examiner advertising (\$1,050). A big thank you to Arrowhead Forensics for once again providing the speaker gifts (Tervis Mugs). Lastly, lots of door prizes were received to be raffled off to the attendees.

CBD needs to be aware of other conferences being scheduled at the same time. Multiple vendors stated that they were attending the North Carolina Division meeting, which was the same week.

Crime Scene Certification Committee

Kelly Ayers provided an update that the parent body IAI is no longer providing any funds from applicants to the regional bodies in reference to certifications. Discussion took place in regards to if the CBD certification committees are still needed. Further discussion will take place at a future date and the committees will remain intact.

Student Development Committee

Kelly Ayers stated that there are five posters being presented on Saturday (four from WVU and one from GW). Discussion took place that the CBD needs to advertise heavily at other universities to attempt to get them more involved. This advertising will be in regards to both the conferences and seminars.

Bill Greene with Prince George's County will be the guest speaker for the student lunch session. His topic will be in regards to what employers are looking for in new hires and possible disqualifiers.

Possible job fair at future conferences for the students will be considered.

Discussion took place in regards to the amount of the scholarship and increasing the total from up to four \$500 scholarships to a greater amount and only offering one scholarship. Discussion also took place about a possible point system that may be implemented in the selection of the applicant. The scholarship committee will be asked for their input and discussed further.

Continuing Education Committee

Rebecca Wood stated that DCJS continuing education hours for law enforcement approved 13 credit hours for the 2017 Spring Educational Conference for the State of VA. The CBD was unable to receive any for the state of MD. More research needs to be conducted in regards to the other credit hour options to attract law enforcement to future CBD events. DCJS also offers free advertising.

7. Constitution and Bylaws

Discussion took place in regards to potential changes to the Constitution and Bylaws. Jeff Barnes will be reviewing and updating potential changes to be presented to the Board.

8. New Business

Jeff Barnes made a motion that the revenue from the 2017 Fall Seminar will go into the student scholarship fund. Kelly Ayers seconded. Discussion took place and motion passed unanimously.

Jeff Barnes made a motion that any revenue made by the ticket raffle at the 2017 spring educational conference will be donated to the scholarship fund, Mallory McCormick seconded. Discussion took place and motion passed unanimously.

Board Member Jessica Shaffer proposed the idea of extending conferences to 3 or 4 days and holding the conferences during the week instead of the weekend. Discussion took place and it was decided that this topic will be addressed at a future date and time. An additional discussion took place in regards to facilitating specific training tailored to educate attorneys and judges. This specific training could possibly be in the form of a fall seminar. The CBD will take this into account when creating future agendas and possible topics to gain interest. Another possibility would be conducting a webinar.

President Rebecca Wood proposed that an Honorary Life Membership be presented to Da-il Kim, Webmaster for all his hard work these past three and a half years. A motion was made by Rebecca Wood, to present Da-il Kim with an Honorary Life Membership. Seconded by Jessica Shaffer. Discussion took place. Motion passed unanimously.

Board Member Frank Curran III proposed an idea in regards to the fall seminar format. Would it be beneficial to conduct a symposium rather than a seminar? The CBD would create a set agenda that is presented and it would take place different times of the year and move around to different locations. This topic will be discussed at a future date and time.

President Rebecca Wood spoke for Historian Sarah Dwyer in regards to purchasing a designated camera by the CBD for use by the Historian. Discussion took place and possible vendor donation or discounted rate from WVU will be considered. Further discussion will take place at a future time and date. Additionally, discussion took place into what documents are considered historical as Sarah Dwyer is sorting through material received at the 2016 spring educational conference. Sarah will categorize the documents received and provide them to the board for further discussion on which should be retained.

9. Adjournment

Meeting adjournment motion proposed by Jessica Shaffer at 2:00 pm, seconded by Mallory McCormick, motion passed unanimously.



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Business Meeting Minutes

Clarion Hotel, Frederick, Maryland

April 22, 2017



The meeting was called to order by President Rebecca Wood.

Motion made by Jeff Barnes to waive Robert's Rules of Order, seconded by 1st Vice President Kelly Ayers, motion passed unanimously.

President Rebecca Wood asked the Secretary/Treasurer, Jessica Landi, to read the minutes of the last business meeting. Jeff Barnes made a motion to waive the reading of the minutes as they were posted, seconded by Jessica Shaffer, motion passed unanimously.

Reports from Officers:

Secretary/Treasurer

Jessica Landi stated that the Treasurer's Report was posted on the board for everyone to review. Jessica Shaffer made a motion to accept the Treasurer's Report as posted, seconded by Jeff Barnes, motion passed unanimously.

President

Rebecca Wood thanked everyone for attending and stated that it was a successful conference and we had 111 attendees (35 members, 38 students and 38 daily registrations).

First Vice President

Kelly Ayers is in the midst of planning next year's conference. Location will be Morgantown, WV with a theme of "Celebrating 20 years of forensic science at WVU". Planning to partner with WVU to hopefully draw in alumni and obtain some new members.

Second Vice President

Chris Claytor thanked all the speakers and instructors for participating in this year's conference. There were no cancellations. Proposed venue for the 2017 Fall One-Day Seminar will be the Richmond Police Department's Training Division in Richmond, VA. Date to be determined and will be provided at a later date (October, 2017).

Third Vice President/Vendor Coordinator

Shelly Brazelle stated that we had 11 vendors purchased a table and attended the conference. The total revenue was \$8,500 (vendor tables, sponsorships, pre-printed advertising and The Examiner advertising). Shelly thanked the other officer's for assistance throughout the process and informed all members to thank the vendors if you see them at the Banquet dinner or at other conference in the future.

Historian

Sarah Dwyer hoped everyone enjoyed the table that was setup at the registration desk with the CBDIAI's historical items. This will be setup at all future conferences.

Sergeant in Arms

Laneatte Turner - Nothing to report.

Committee Reports:

Crime Scene Certification Committee

1st Vice President Kelly Ayers informed the members in attendance of the increase of \$100 for the application process. Also, the division no longer receives any funds for having a member pass the certification exam (Secretary/Treasurer Jessica Landi, stated that it was approximately \$800 received last year for all disciplines). Discussion took place and it was determined that the Committee's will stay intact due to communication with the parent body in regards to scheduling proctor's for certification exams.

Audit/Finance Committee

Les Michel noted that the financial records are in good order. A few minor recommendations were discussed as follows: searching for an alternative method for making deposits for Secretary/Treasurer Jessica Landi, as the closest PNC bank is over 45 minutes away, the informing of the Secretary/Treasurer when an officer is traveling on behalf of the CBD-IAI and to further look into vendors in which the CBDIAI purchases supplies from to see if any cost savings is possible.

Scholarship Committee

President Rebecca Wood reported on behalf of Sylvia Buffington-Lester that the CBD-IAI has awarded two scholarship winners of the George H. Robinson Scholarship, Kimberly Burke from Ohio Northern University and Allison Fisher from Stephenson University.

Student Development Committee

1st Vice President Kelly Ayers reported that the student turnout was great. Student lunch and poster presentation participation also was successful.

Membership Committee

Board of Director's member Gabbe Toy reported the membership is currently at 514 members (252 active, 14 associate, 1 life associate, 5 honorary life, 59 sustaining life, 172 life active and 11 sustaining life associate) and that we have 20 new members since the previous conference. We also have had 69 active members that have not renewed their dues for 2017.

Latent Print Certification Committee

Second Vice President Shelly Brazelle, spoke on behalf of Brian Jones. Brian proctored a total of 4 certification exams this past year and is in the process of scheduling 2 more in the CBD-IAI district.

Motion made by Stephen Meagher to accept committee reports as stated, Frank Curran seconded, motion passed unanimously.

Unfinished business:

None



New Business:

Les Michel began discussion in regards to seeking/locating more high profile speakers to attract not only the CBD-IAI membership but new individuals in the law enforcement/forensic community to come take part in the CBD-IAI.

Election of Officers:

Nominating Committee Recommendations

President – Kelly Ayers

1st Vice President – Chris Claytor

2nd Vice President – Shelly Brazelle

3rd Vice President – Danielle O’Neill

Secretary/Treasurer – Jessica Landi

Editor – Kelly Peak

Sargent in arms – Lanette Turner

Historian – Sarah Dwyer

Hearing no nominations from the floor for any of the officer positions, Stephen Meagher made a vote of acclimation to accept the nomination, Jeff Barnes seconded, motion passed unanimously.

Election to the Board of Directors:

Nomination Committee Recommendations

Frank Curran, III

Jessica Shaffer

Gabrielle Toy

Amanda Lane

Mallory McCormick

Hearing no nominations from the floor for the Board of Directors position, Stephen Meagher made a vote of acclimation to accept the nomination, Jeff Barnes seconded, motion passed unanimously.

Rebecca wood made a motion of adjourn, Jeff Barnes seconded, motion passed unanimously.

Constitution & Bylaw Amendments

CHESAPEAKE BAY DIVISION OF THE INTERNATIONAL ASSOCIATION FOR IDENTIFICATION

ARTICLE XIII: AMENDMENTS TO THE BYLAWS

Section 13.01 Board Approval of Proposed Amendments Any proposal to change the Bylaws of the Division must be approved by a majority vote of a quorum of the Board of Directors prior to being presented to the general membership.

Section 13.02 Required Vote Any motion to change the Bylaws of the Division must be approved by a majority vote of the delegates attending the Business Meeting at the annual conference.

Section 13.03 Publication

- (a.) The proposed changes to the Bylaws will be published in the Division's official publication prior to the vote of the general membership at a annual conference.
- (b.) In the event of an "emergency" situation, the Board of Directors shall decide upon a proposed change to the Bylaws, post said proposed change, and a vote shall be taken at the general Business Meeting without prior publication in the official publication of the Division. In the event of this occurrence, the changes to the Bylaws will be published in the next edition of the Division's official publication.

Section 13.04 IAI Approval of Amendments All amendments to the Division Constitution and Bylaws shall be submitted to the IAI Chief Operations Officer and shall not be effective until approved by the IAI. If the Chief Operations Officer does not take any action within six (6) months after receipt by the Association, the submitted amendment or amendments are automatically approved without any further action by the IAI.

To view CBD-IAI's Constitution
and Bylaws in full, go to
<http://cdbiai.org/about-cbdiai>



Message from the Secretary/Treasurer

Dear Chesapeake Bay Division Members,

I would like to thank all our members for the support of the division and for attending our conferences. The CBD-IAI strives to facilitate in the professional growth and knowledge of our members. I invite all members to get involved with the organization and come be a part of the excitement as we expand our efforts to make a greater impact in the forensic sciences.

Our 2018 Spring Educational Conference is approaching quickly. The conference will be held on April 26 & 27th in Morgantown, WV. Our President, Kelly Ayers, in conjunction with the other officers have put together an impressive two-day program. We will be holding interviews for officer and board positions at the conference. You can view the conference agenda and register online at <http://cbdiai.org/conferences>.

Both the 2017 Spring Educational Conference in Frederick, MD and the 2017 Fall Seminar in Richmond, VA were a tremendous success. I would like to take a moment to thank the officers and board members for all their hard work. Please let us know if your university or agency is interested in hosting our one-day seminar.

If any members have suggestions regarding the CBD-IAI's conferences, seminars, student involvement and ways to attract new members, please forward recommendations to cbdiaisec@gmail.com. Thank you all again for choosing to support the CBD-IAI!

-Jessica Landi, Secretary/Treasurer

From the Office of the Secretary/Treasurer

April 1, 2016 through March 31, 2017

Operating Accounts

Total balance in Operating Account as of April 1, 2016 **\$53,551.81**

Deposits from income

Interest Received on Operating Savings Account \$38,607.92

Interest Received on Operating Savings Account \$11.26

Transfer to Scholarship Savings (contributions received for Scholarship Fund) \$2,359.11

Total Amount Received 04/01/16 through 03/31/17 \$36,260.07

Total Disbursements \$36,600.94

Net Balance in Operating Accounts \$53,210.94

Balance in Checking Account \$29,421.33

Balance in Operating Savings \$23,540.06

Balance in Petty Cash \$249.55

Total Received from Latent Print Certification \$450.00

Total Received from Crime Scene Certification \$200.00

Total Received from Forensic Video Certification \$100.00

Total Received from Forensic Photography Certification \$100.00

Scholarship Account

Balance in the Scholarship Savings as of April 1, 2016 \$35,459.98

Direct Contributions to Scholarship Fund \$2,582.11

Interest Received on Scholarship Savings Account \$17.08

Transfer to Checking Account for Scholarship Recipient \$1,000.00

Net Balance in Scholarship Account \$37,059.17

Total Balance All CBD Accounts \$90,270.11

Respectfully Submitted,
Jessica Landi-Secretary/Treasurer



Profit and Loss Statement

Office of the Secretary/Treasurer
Spring 2017 Conference Frederick, MD – April 21-22, 2017

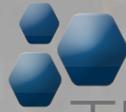
INCOME:

Conference Registration.....	\$14,412.50
Vendor Registration.....	\$2,400.00
Vendor Sponsorship of Social Events.....	\$5,000.00
Vendor Flyers.....	\$300.00
50/50 April 22, 2017	\$200.00
Total Income.....	\$22,312.50

EXPENSES:

Hotel Fees (food, meeting rooms, AV fees, etc. on master bill).....	\$11,034.18
Speaker's Gifts	\$0.00
(Sponsored by Arrowhead Forensics)	
Hospitality and Miscellaneous.....	\$1,006.45
(President's Plaque, Vendor Gifts, Registration Table Decor, etc.)	
Poster Presentation Winners.....	\$225.00
Registration Packet Supplies.....	\$153.33
(Folders, Certificate Paper, Meal Tickets, and Note Cards)	
* Program Guide	\$0.00
Total Expenses	\$12,418.96
* Programs printed in house with existing supplies	
INCOME.....	\$22,312.50
EXPENSES.....	\$12,418.96
PROFIT	\$9,893.54

Respectfully Submitted,
Jessica Landi-Secretary/Treasurer



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DISCOVERY

TRAINING



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Profit and Loss Statement

From the Office of the Secretary/Treasurer
Fall 2017 Seminar Richmond, VA – October 21, 2017

INCOME:

Seminar Registration.....	\$1,125.00
Vendor Sponsorship.....	\$1,275.00
Total Income.....	\$2,400.00

EXPENSES:

Sugar Shack Donuts/Coffee and Publix Fruit (Breakfast).....	\$159.03
Drinks.....	\$23.52
Mission BBQ and Publix Salad (Lunch).....	\$629.49
Publix pound cake and cookies (Break).....	\$35.21
Speaker Gifts (Mousepads and Coasters).....	\$42.50
Total Expenses.....	\$889.75

* Programs printed in house with existing supplies

INCOME.....	\$2,400.00
EXPENSES.....	\$889.75
PROFIT.....	\$1,510.25

Respectfully Submitted,
Jessica Landi - Secretary/Treasurer



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- Conferences
- Depositions
- Meetings
- Receptions
- Staff Retreats
- Seminars
- Sporting Events
- Team Building
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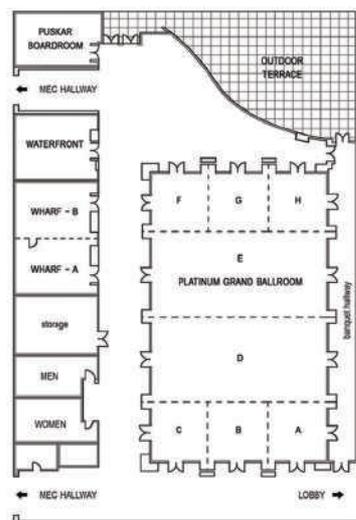
**	Dimensions	Sq.ft.	Theater	Classroom	Conf.	U-Shape	Reception	Banquet
Platinum Ballroom	108x66	7,128	900	400	N/A	N/A	1000	450
Salon ABCDE	86x66	5,676	760	320	N/A	N/A	840	360
Salon ABCD	54x66	3,564	340	200	N/A	N/A	420	210
Salon EFGH	54x66	3,564	340	200	N/A	N/A	420	210
Salon ABC	22x66	1,452	120	80	50	48	120	90
Salon FGH	22x66	1,452	120	80	50	48	120	90
Salon AB	22x44	968	100	50	36	32	100	60
Salon BC	22x44	968	100	50	36	32	100	60
Salon FG	22x44	968	100	50	36	32	100	60
Salon DE	64x66	4,224	520	240	N/A	N/A	600	240
Salon A,B or C	22x22	484	35	24	18	16	50	30
Salon F,G or H	22x22	484	35	24	18	16	50	30
Salon D or E	32x66	2,112	260	120	N/A	N/A	300	120
Puskar Boardroom	28x19.5	546	N/A	N/A	16	N/A	N/A	N/A
Waterfront	21x28	588	40	24	16	16	30	30
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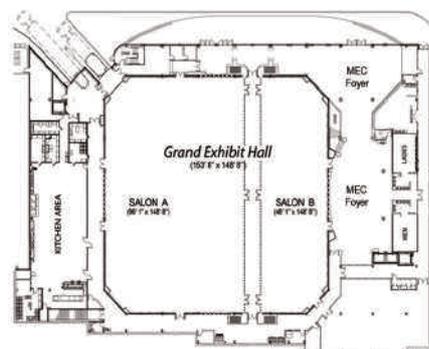
**	Dimensions	Sq.ft.	Theatre	Classroom	Ceiling Height	10x10 Booth	8x10 Booth	Banquet
Main Exhibit Hall	154x149	22,946	2,500	1,400	30 ft.	110	140	1,500
Exhibit Hall A	96x149	14,304	1,500	1,100	30 ft.	70	85	900
Exhibit Hall B	46x149	6,854	600	336	30 ft.	33	40	350
MEC Foyer	Varies	5,280	N/A	N/A	11 ft.	N/A	N/A	N/A
MEC Lobby	Varies	6,709	N/A	N/A	12-15ft.	N/A	N/A	N/A
George R. Farmer Jr. Boardroom	30x20	600	N/A	N/A	12ft.	N/A	N/A	9
Mon River A	14x18	252	N/A	N/A	12ft.	N/A	N/A	12
Mon River B	16x18	288	N/A	N/A	12ft.	N/A	N/A	12
Mon River A&B	30x18	540	N/A	N/A	12ft.	N/A	N/A	24
Green Room	35x25	875	N/A	N/A	12ft.	N/A	N/A	30
Outdoor Terrace	98x13	1,274	N/A	N/A	N/A	N/A	N/A	N/A
Outdoor Terrace	37x20	740	N/A	N/A	N/A	N/A	N/A	N/A

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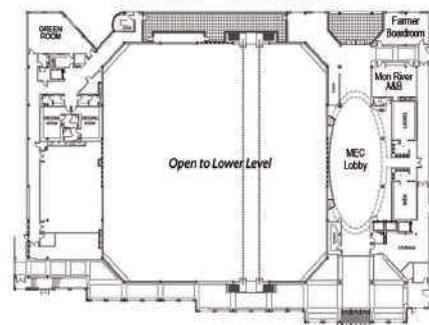
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Tentative Agenda: all presentations/workshops are subject to change

WEDNESDAY, APRIL 25, 2018

7:00 PM to 9:00 PM President's Welcome Reception

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THURSDAY, APRIL 26, 2018

7:00 AM Registration opens

7:00 AM to 8:00 AM Continental breakfast

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8:00 AM to 9:00 AM Opening Ceremonies
Presentation of Colors by Morgantown Police Department
Invocation
President's Welcome by Kelly Ayers, WVU

9:00 AM to 10:00 AM Welcome Address by WVU President E Gordon Gee
Keynote Address by Dr. Michael Yura

WORKSHOPS

10:00 AM to 12:00 PM *Detect More Evidence: Extend Your Search to Beyond the Visible*, Allyce McWhorter and Rebecca Walls, Foster + Freeman Ltd

1:00 PM to 5:00 PM *ULW*, Kimberly Bolyard & Marian Price, FBI CJIS

1:00 PM to 5:00 PM *Fracture Examination*, John Vanderkolk, Indiana State Police Laboratory

LECTURES

10:00 AM to 11:30 AM *Mared & Karen: The WVU Coed Murders*, Geoffrey Fuller, S. James McLaughlin and Kendall Perkinson.

11:30 AM to 12:00 PM *DNA or Latent Prints or Both?* Raymond Jorz IAI President/Lake County Crime Laboratory

12:00 PM to 1:00 PM LUNCH ON YOUR OWN
*12:00 PM to 1:00 PM Retirement seminar, Les Michel, Location at hotel, lunch available for purchase

1:00 PM to 2:00 PM *Serving Justice: Computer Interpretation as a Modern Tool for DNA Analysis*, Dr. Ria David and Beatriz Pujols, TrueAllele®

2:00 PM to 2:30 PM *Recent Advances in Face Recognition Technology*, Thirimachos Bourlai, WVU MILab

THURSDAY, APRIL 26, 2018 (cont'd)

2:30 PM to 3:00 PM

Afternoon Break

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3:00 PM to 5:00 PM

Vendor Open House: Vendor area open for conference and nonconference attendees

3:00 PM to 5:00 PM

Communicating Expert Findings: Strengths and Limitations, Hari Iyer and Steve Lund, NIST

6:00 PM to 7:00 PM

Vendor Meet and Greet Reception

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7:00 PM to 9:00 PM

Buffet Dinner with



9:00 PM to

Night Cap Social in Hospitality Suite

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FRIDAY, APRIL 27, 2018

7:00 AM

Registration opens

7:00 AM to 8:00 AM

Hot Breakfast

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WORKSHOPS

8:00 AM to 12:00 PM

Making Optimal Decisions in Latent Print Examinations, John R Vanderkolk, Indiana State Police Laboratory, and Dr. Tom Busey, Indiana University, Department of Psychological and Brain Sciences

8:00 AM to 12:00 PM

Overlooked Drug Evidence at Crime Scenes, Retired Deputy Joe Keil, Manitowoc County Sheriff

8:00 AM to 12:00 PM

Forensic Entomology for Investigators, Dr. Rachel Mohr, ABFE, WVU
*This workshop will be held offsite

FRIDAY, APRIL 27, 2018 (cont'd)

WORKSHOPS (cont'd)

1:00 PM to 4:00 PM *An Introduction to Forensic Vacuum Metal Deposition for Latent Fingerprint Development*,leigh Brewer, BSC MPHIL, West Technology Forensics

LECTURES

8:00 AM to 9:00 AM The McAllister Homicide, Jessica M. Shaffer, Forensic Scientist, Western Maryland Regional Crime Laboratory, Hagerstown Police Department

9:00 AM to 9:30 AM The Use of Forensic VMD for Latent Fingerprint Development on Fired Ammunition,leigh Brewer, BSC MPHIL, West Technology Forensics

9:30 AM to 10:00 AM Forensics in the Battlefield: One Examiner's Experience, Erin Armstrong, Fingerprint Specialist, CLPE, Treasury Inspector General for Tax Administration

10:00 AM to 10:30 AM Break

10:30 AM to 11:00 AM "How Old Are They?" A White Lines Case Study That Defies Expectations, Meredith Coon, Forensic Scientists II, Baltimore Police Department

11:00 AM to 12:00 PM Bolt Out of the Blue: Forensic Investigation of Lightning and Electricity Related Deaths, Stephen Richey, Kolibri Forensics

12:00 PM to 1:00 PM LUNCH ON YOUR OWN

*12:00 PM to 1:00 PM Student Lunch Session – Please ensure you sign up on your registration.
All Those Classes and All I Have To Show For It Is This Crazy Pen: How My Forensics Degree Let Me Travel the World, Allyce McWhorter and Rebecca Walls, Foster + Freeman Ltd

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MYSTAIRE

1:00 PM to 3:00 PM **BREAKOUT SESSION** – Bridging the Gap: Investigative Techniques When Forensic Evidence is Lacking, Special Agent Haley Nelson, South Carolina Law Enforcement Division (SLED)

1:00 PM to 1:30 PM The Interstate Photo System – Today's Capture – Tomorrow's Search, Margery Broadwater, Management and Program Analysis FBI CJIS

1:30 PM to 2:00PM How to Improve Mugshot Image Quality, John Tomanovich, Compass Technical Consulting, LLC

2:00 PM to 3:00 PM Considerations for Forensic Response in a CBRNE Environment, Ashleigh Wojslawowicz CSI, City of Charleston Police Department

FRIDAY, APRIL 27, 2018 (cont'd)

3:00 PM to 3:30 PM Afternoon Break and Poster Contest

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3:30 PM to 4:00 PM How Can You Teach Forensic Science Online?, Robin Bowen, WVU

Business Meeting will be held at the conclusion of the last speaker.

7:00 PM to 9:00 PM Installation Banquet Dinner

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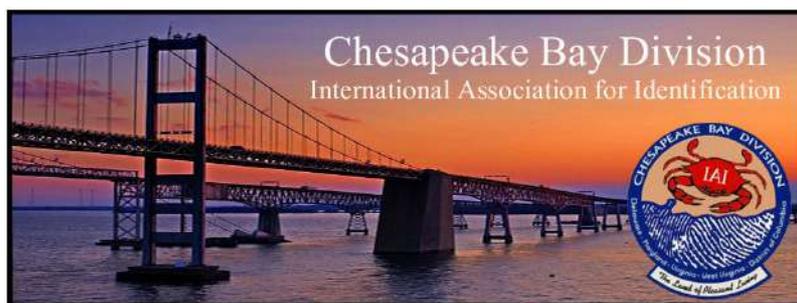


9:00 PM to Night Cap Social in Hospitality Suite

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There are no strict formatting requirements, but all submissions must contain the essential elements needed to convey the article. Divide the article into clearly defined, logically organized sections. For research articles: abstract/introduction, materials, methods, results, conclusions, artwork and tables with captions, etc. For general papers: statement of purpose, analysis of procedures or evidence, conclusions and implications. Please ensure that any figures/tables included are placed next to the relevant text rather than at the bottom or top of the file.

Footnotes should be used sparingly as the program I use to publish does not support this. All submissions should be typed and double spaced. Please review and edit your article thoroughly before submission.

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Research

Forensic "Food for Thought" Quick Studies:

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Forensic Science – Let’s talk about the positives for a change!

Danielle O’Neill
M.S.F.S. CLPE
3rd Vice President CBDIAI

Before glamorous television shows, such as CSI and NCIS tried to give a glimpse into the world of forensics, few knew that forensic testing existed, let alone what it was. Truth be told, scientists and law enforcement officials have been working behind the scenes of crimes for over a hundred years. The so-called “CSI effect” has caused the public, including jurors and other members of the court, to question the reliability of the evidence forensic scientists are presenting. Errors made by forensic scientists in highly publicized criminal cases (i.e. Madrid, Shirley McKie, Annie Dookhan, etc.) have caused intense scrutiny of the science of forensics. These cases along with others have led national and international commissions and boards to write detailed criticisms and areas of required improvement in each of the forensic science disciplines.

The NAS report of 2009 and the PCAST report of 2016 are just two well-known articles which come to mind. Some of these responses have prompted the federal government to provide more funding to state and local laboratories which have allowed for additional training and research providing significant advancement in many disciplines. Other critiques lacked a basic understanding of the science and were provided by individuals who had limited forensic science knowledge.

Even though errors have been made by forensic scientists, when compared to the amount of accurate results reported out every day these errors are small in number. Analysts are constantly questioned about the aforementioned cases partially because they have garnered so much media attention. News agencies do not sell papers based on articles about a scientist at the police laboratory who analyzed one thousand glassine packets, all of which tested positive for heroin; thus bringing down a major supplier. Why? Because this is a mundane task analysts complete accurately day in and day out. What glues people to their televisions is the bust of the supplier or the intrigue of government incompetence.

As human beings, forensic scientists do make mistakes, no one is perfect. Forensic laboratories around the country and the world have quality assurance systems. These quality assurance programs have been developed, put into place and adjusted when necessary to help catch and correct most if not all errors that may have occurred in a case. In addition to these quality assurance programs most laboratories are accredited or obtaining accreditation from internationally recognized accrediting bodies, which implement ISO standards. These laboratories gain accreditation in order to be held to a higher standard. Extra steps are being taken to prevent mistakes from happening and to correct ones that have been made. In addition, forensic scientists go through rigorous ethics training. Most analysts go into this field with a sense of civic duty, hoping to provide a service to their community. A few bad apples do not negate the hard work, professionalism and commitment to rigorous scientific standards

provided by forensic examiners for over 100 years. It is not as if we breed bad apples as a majority, but like in any field that does happen. It is great to bring to light the negatives so they can be improved upon, but it would also be just as great to put forward all the positive progress, work and advancement the field has achieved over the last one hundred years.

Reference:

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf

<https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093498/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3299696/>



Method Validation Simplified

Danielle O'Neill
M.S.F.S. & C.L.P.E.
3rd Vice President CBDIAI

In any science field, there are certain requirements that need to be met in order to begin or continue to experiment, process, and invent. Method validation is one of the requirements set forth by accreditation bodies in order for forensic laboratories to begin or continue analyzing evidence. Method Validation is a demonstration that a particular procedure, process, reagent, or instrument gives the expected results when put into practice. Laboratories are not given structure or directions on how exactly to go about this; they just have to come up with a plan, or use references for each in order to show that the test, reagent, instrument, etc. works. In my experience laboratories tend to do either too little or too much.

The reason for the excess or the lacking is because there is no direction in how a laboratory should validate their procedures. The easiest way to validate is to come up with a standard operating procedure (SOP) that you want to implement and use that as your laboratory's standard method of validation. An SOP will speed up the process, ensure consistency, and once complete, no additional documentation is required.

How do I record the results? It is not necessary to write a book of your results and everything you used. The simplest way to document a method validation is to put it in a worksheet. Figure 1 and 2 below are examples of blank and completed validation worksheets. All results should be documented even the failed attempts. Adjust the SOP where necessary in order to get the results desired and then retest.

How many times do I have to run the process? This is always a question on analysts' minds when running a method validation. Is once enough? No, this could have been a fluke or chance it does not prove that the process, reagent, etc. actually works. Should we run it one hundred times, just in case? No, this is a complete waste of time. It is not wrong, but it is just in excess and not an efficient way of doing things. Many laboratories do this because they believe it is what the accreditation bodies want to see. In my experience, anywhere from three to ten runs is sufficient to show consistency in results. Consider using test items your laboratory will encounter for more representative results.

For example, my laboratory's SOP for the validation of crystal violet, a reagent for developing latent prints on adhesive surfaces, were written based off of research articles and the laboratory conditions. In order to update the validation, three tests were conducted on five items of evidence my laboratory regularly encounters. The results were documented using worksheets, and along with resulting photographs stored on the laboratory's network. Once approved by the quality assurance manager this process was implemented and is very efficient on processing adhesive items. It is not necessary to over validate but it is necessary to do the validation more than once in order to show consistency in results.

When are Method Validations required? Method validations should be conducted on equipment or techniques that have a significant impact on the results. Widely accepted methods that have been peer reviewed do not need to be validated. Journal articles can guide you in the right direction for what

temperature, humidity, etc. to start with in your process but the laboratory should adjust based on the conditions within. In order to get the best case/evidence results. Method validation does not have to add to the stress of a laboratory's workflow, but if simplified, can make it more efficient and effective.

Figure 1

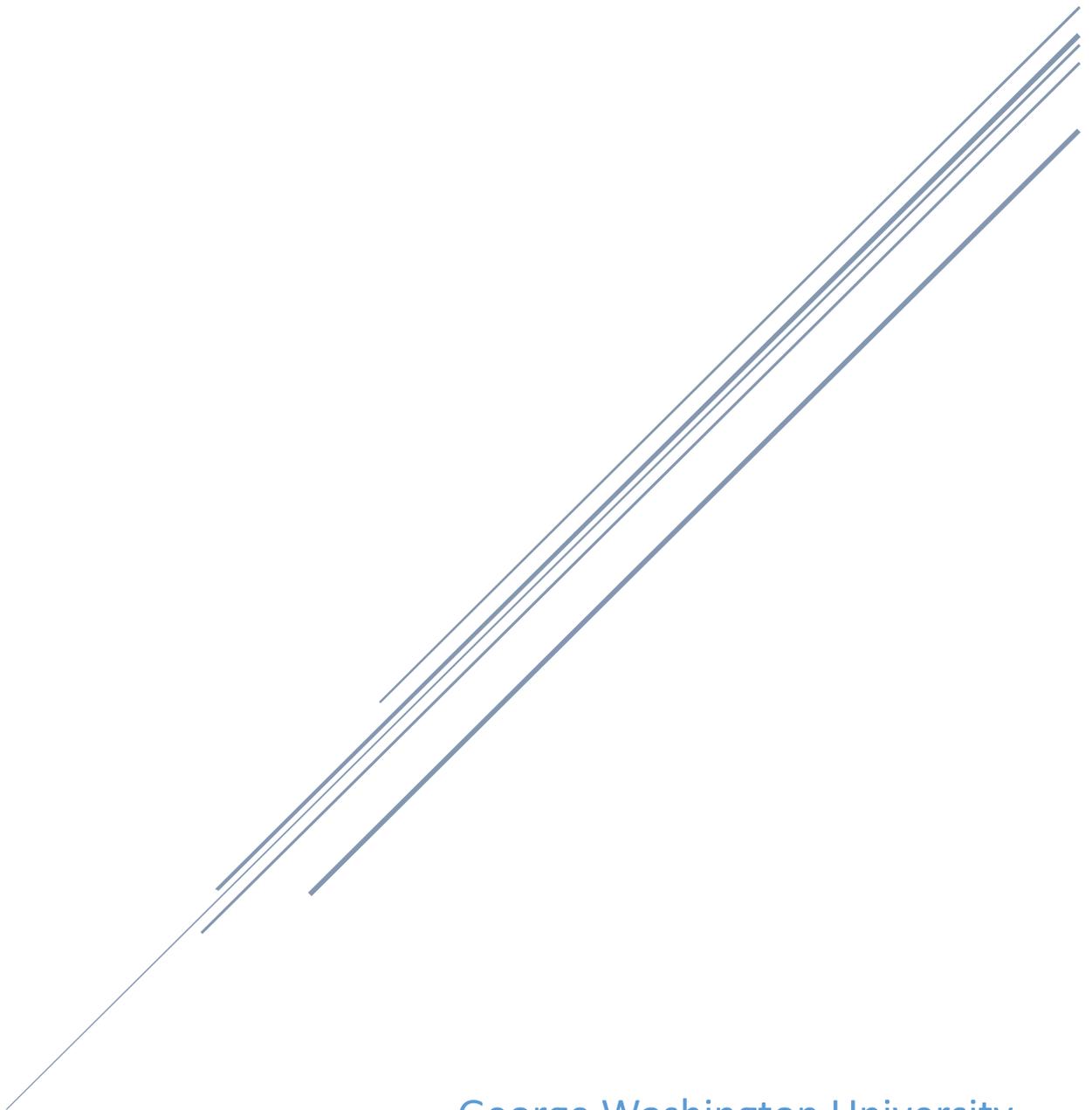
Process:	
Manufacturer and Lot:	
Date(s) of Process:	
Description of Substrate(s):	
Parameters:	
Notes:	
Result:	Trial #1: Trial #2:
Examiner(s):	Primary Verifier:
Photograph of Impression(s):	
Camera Model:	

Figure 2

Process:	Crystal Violet
Manufacturer and Lot:	Sirchie 3/17 (In house lot number)
Date(s) of Process:	January 18, 2017
Description of Substrate(s):	Three (3) pieces of clear tape, Three (3) pieces of packing tape, Three (3) postage stamps, Three (3) pieces of Duct Tape, and Three (3) white labels
Parameters:	Aqueous mixture of 0.1g Crystal violet weighed using an Explorer/OHAUS E06120 balance to 100mL of distilled water. Stir with magnetic stir bar on fisher scientific stir plate until dissolved under Fisher Scientific 93-508Q hood.

KNOWING LEFT FROM RIGHT: IDENTIFYING A RELATIONSHIP BETWEEN BIFURCATION DIRECTION AND HAND OF ORIGIN

Jordan Edgell, MFS Student



George Washington University
jedgell2175@gmail.com

Introduction

Fingerprints have been an important part of our criminal justice system since their implementation in the United States military and police forces in the early 1900's (Barnes, 2012). Because of their ability to identify an individual from a population, they are one of the most powerful tools at the disposal of investigators. While they are very versatile, they frequently appear in crime scenes as partial representation of the whole fingerprint. Latent print experts are trained on how to work with such partial prints, but are always exploring methods that may improve their ability to perform comparisons more efficiently and accurately locate a sample to use for comparing.

Reports such as the NAS report (2009) and the PCAST (2016) report have critiqued the lack of traditional experiments that prove what many experts have known anecdotally or culturally. One such observation is using the direction of bifurcation openings in loop patterned fingerprints to indicate which hand the fingerprint has originated. A bifurcation is a minutiae feature that occurs when a single ridge splits or divides and becomes two ridges without separation, and is one of the most common minutiae found in fingerprints (Barnes, 2012). The direction of an opening is found by starting on the single ridge and moving toward the two ridges. Figure 1 shows an example of both left opening and right opening bifurcation.



Figure 1: Left opening and right opening bifurcation illustrations, respectfully

A loop is the most common fingerprint pattern to occur, and is the pattern that results from ridges entering one side of the print, going past the middle point of the finger, recurving, and exiting on the same side. Figure 2 shows an example of both a left slant loop and a right slant loop.

Traditionally, loops that have ridges that enter and exit from the left side of a finger originate from the left hand, and loops with ridges that enter and exit on the right side of the print originate on the right hand (Christophe Champod, 2016).

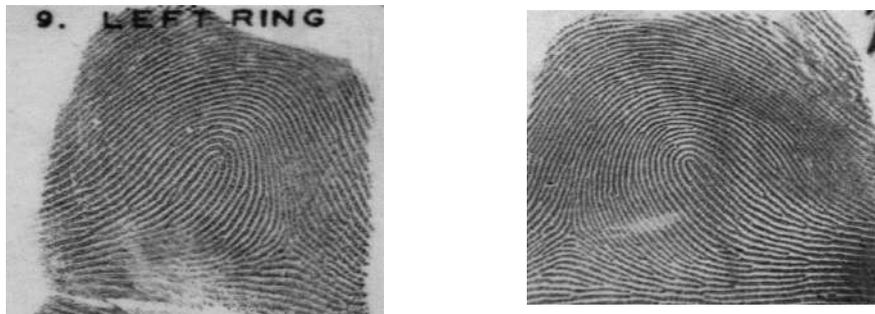


Figure 2: Left and right slant loops

The aim of this paper is to determine if there is a relationship between the direction of bifurcation openings and the hand that the fingerprint originated in loops.

Materials

Samples

Sample fingerprint images were obtained from the NIST Special Database 4 available online on the NIST website (NIST, 2017). This database contains 8-bit gray scale images, with a resolution of 19.7 pixels per millimeter. This database was chosen due to its ease of access and download capability, the pool of potential samples, and guarantee of both left and right loops being present. Additionally, using a database of fingerprints that has been made available for public use sanitizes the sample and removes much of the personal risk associated with using

fingerprints for research purposes. When selecting samples, only the quality of the ridges were considered.

Image processing

All of the images were processed and enhanced using GIMP, a free image manipulation software. This was chosen because of its availability and affordability. Most sample images did not require any enhancement from the image pulled from the database, and the ones that did were only manipulated using the levels tool.

Statistical analysis

Microsoft Excel was used to complete the statistical analysis and create the graph used in this study.

Methods

Choosing images to use

Starting at the first image of the database, images that were either a right or left slant loop were pulled out of the database and saved in a different folder, until the number of samples pulled was 400. 200 of the samples were right slant loops, and 200 were left slant loops. Discretion was given if the sample contained obvious distortion due to factors such as heavy pressure or other obvious distortion factors. Since the database had two impressions of each finger, if the first one was deemed unusable for the study, the second print was considered. In the case that neither of the prints were suitable, the sample was not used. After evaluating the 400 pulled sample loops, several samples were deemed unusable due to the lack of quality and clarity of the ridges, thereby decreasing the number of samples from 200 per hand to the amounts shown in Figure 3.

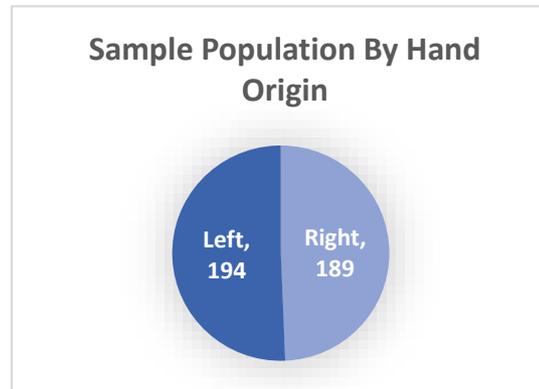


Figure 3: Total Population of sample used in study, broken down into hand of origin

Determination of inner and outer sections

Once the images were selected, the core of each sample was identified. Fifteen parallel ridges were counted out from the core, and that measured length was used as a radius to define the perimeter of the inner section. This was repeated for every sample. A similar method of counting was done in a study counting minutiae and finding frequencies and was adapted for this study (Esperanza Guterrez-Redomero, 2011). Figure 4 shows an example of how the inner and outer sections were defined.



Figure 4: Inner and outer sections of Sample 1147

Identifying Bifurcation

After the samples had the inner and outer sections determined, bifurcations in the sample were identified. Left opening bifurcations were marked with a purple dot, and right opening bifurcations were marked with a blue dot. In a few samples, left or right preference could not be determined, and those bifurcations were marked with a red dot. Figure 5 illustrates the type of

bifurcations that were encountered and the associated color used to mark them, and Figure 6 is an example of a sample after a completed mark up.

Counting and Summarization of the Bifurcations

After marking each sample, the bifurcations were counted. A spreadsheet was created and utilized for the purpose of recording the data. Inner bifurcations were recorded separate from the outer bifurcations, left and right opening bifurcation respectively. Vertical bifurcations were also recorded separately. Bifurcations that were on the border of the inner and outer sections were counted in the inner section. The total bifurcations reflects all of the marked bifurcations in the sample. Tables 1, 2, and 3 show the results of the data.

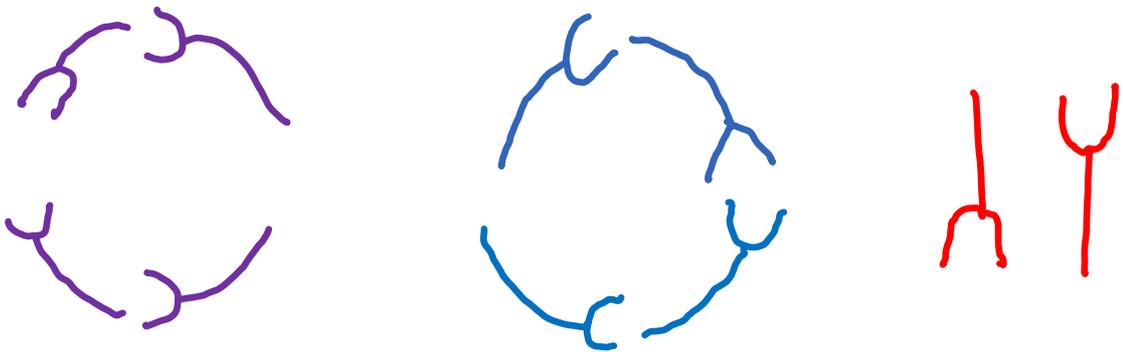


Figure 5: Examples of different bifurcations encountered in the sample, and how they were labeled. The colors purple, blue, and red respectively were used to mark up the samples.

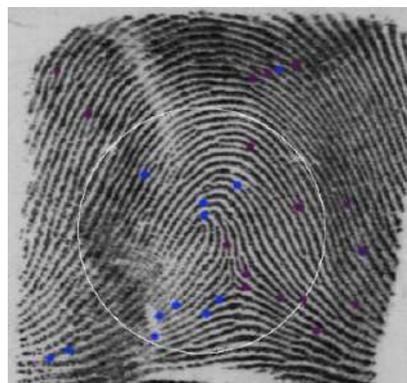


Figure 6: Sample 1147_09 after complete bifurcation markup.

Results

Table 1: Breakdown of Minutiae Openings for the Sample Population

All Samples	Bifurcations Inside		Bifurcations Outside		Total Left Bifurcations	Total Right Bifurcations	Total Bifurcations in Sample
	Left	Right	Left	Right			
Average	7.03	6.83	7.85	8	14.87	14.83	29.82
Std Dev	3.40	3.38	4.75	5.07	6.30	6.85	9.821
Std Err	0.17	0.20	0.25	0.24	0.32	0.35	0.50

Table 1: Summary of data collected for entirety of sample population

Table 2: Breakdown of Minutiae Openings for the Samples from the Left Hand

Left Hand	Bifurcations Inside		Bifurcations Outside		Total Left Bifurcations	Total Right Bifurcations	Total Bifurcations in Sample
	Left	Right	Left	Right			
Average	5.87	8.66	6.54	9.32	12.41	17.99	30.51
Std Dev	2.83	4.00	4.09	5.62	5.34	6.94	10.51
Std Err	0.21	0.28	0.29	0.29	0.38	0.49	0.75

Table 2: Summary of data collected for loops from the left hand of the sample population

Table 3: Breakdown of Minutiae Openings for Samples from the Right Hand

Right Hand	Bifurcations Inside		Bifurcations Outside		Total Left Bifurcations	Total Right Bifurcations	Total Bifurcations in Sample
	Left	Right	Left	Right			
Average	8.22	4.95	9.19	6.64	17.41	11.59	29.12
Std Dev	3.50	2.54	5.02	4.01	6.23	5.02	9.03
Std Err	0.25	0.18	0.36	0.29	0.45	0.45	0.65

Table 3: Summary of data collected for loops from the right hand of the sample population

Table 4: Hypothesis Testing Results

	Total Bifurcations	Left Opening by Hands	Right Opening By Hands	Left Hand Left v Right opening	Right Hand Left v Right Opening
Whole Image	Equal	Not Equal	Not Equal	Not Equal	Not Equal
Outer Section	Equal	Not Equal	Not Equal	Not Equal	Not Equal
Inner Section	Not Equal	Not Equal	Not Equal	Not Equal	Not Equal

Table 4: Statistical outcomes of Hypothesis Testing on respective samples

Discussion

To begin comparing data sets, it is imperative to understand what is being compared and what the outcomes of the statistical test mean. For this study, a hypothesis test was used to identify any similarity between the various sample means. This test can be used to find if two samples

are different based on sample mean and variance within the sample. The strength of the test is determining if the samples are not equal, and therefore well suited for this study. The null hypothesis is that the number of bifurcations that open toward the left are equivalent to the right opening bifurcations, and the alternative hypothesis is that they are not equal (Giselle B. Limentani, 2005).

To complete the hypothesis test, the following equations were used:

$$t_{value} = \frac{|\mu_1 - \mu_2|}{\sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Equation 1

$$s_p = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}$$

Equation 2

Where t_{value} is the calculated test statistic, μ is the sample means for the various breakdown of the samples, n is the population of each of the samples, and s_p is the pooled measure of standard deviation of the samples. Equation 2 is the method used to calculate s_p . Other values necessary are the critical t value, which must be looked up in a statistic table or using the TIVN function in Excel (degree of freedom, confidence value). For this study, a 95% confidence interval was used. Once the t_{value} is calculated, it is compared to the $t_{critical}$ value. If the t_{value} is greater than $t_{critical}$, the two sample means are not equal.

Tests that are for the whole population or include the whole sample data should result in an equal determination, meaning that the t_{value} is less than the $t_{critical}$. This would indicate that the same number of bifurcations exist in both hands. This was the case for the whole sample size and the

outer section, but not for the inner section. Thus, resulting findings for the inner section do not have as strong of evidence to support the resulting claims. Tests that compare only part of the sample, such as comparing the amount of right bifurcations in either the right or left hands, need to result in a t_{value} greater than the t_{critical} to show that the results reject the null and support the alternative hypothesis. This result is shown in all of the tests similar to the provided example.

Limits of the study

The data in this study was collected by a novice latent print student, and therefore had limited experience choosing true bifurcations. The lower quality of the images being used in conjunction with the inexperience of the author could have led to misidentification of bifurcations, and therefore skewed the data unintentionally.

Conclusions

The data collected in this study shows there is a correlation between the direction that bifurcations open and the hand from which the latent print originated. The hypothesis test showed that there is a difference between the means of the amount of marked left opening and right opening bifurcations in both the right and left hands. To be more specific, the prints that originated from the right hand have more left opening bifurcations than right opening bifurcations, and the opposite is true for the left hand. The left hand contains, on average, five more right opening bifurcations than left opening, and the right hand contains six more left opening bifurcations than the right opening.

This can also be expanded to describe the different amounts of bifurcations in the outer section of the sample. Because latent prints often contain either the outer section or the inner section, the ability to apply these findings would be vital to the usefulness of this study to examiners.

The same findings as the whole sample apply to the outer sections, showing that the left opening bifurcations are more common by three bifurcations in the right hand, and the right opening bifurcations are more common in the left hand by three bifurcations. The inner section, however, proved that the initial sample means for the left and right hands were not statistically dissimilar enough to allow further extrapolations to be valid.

Further research is required to validate these results. Studies that show the commonality of bifurcation in both the inner and outer sections of loop patterned prints, as well as expanding this study to other pattern types would supplement the results of this study.

Acknowledgements

I would like to thank Shelly Brazelle for the continued support of completion of this study. I would also like to thank Norberto Rivera for the idea and advice on how to complete this project.

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The Importance of Detail in Forensic Photo Identification

Colleen Fitzpatrick, PhD

Abstract

The hat, the horse, the man, the scene...the mystery. Who is he and why was he photographed in a top hat and tails sitting on a dead horse in the middle of 8th St. in Sheboygan, WI?

Detailed analysis of the Sheboygan Dead Horse Photo is presented as an example of how much information can be derived from careful examination of a photograph. Drawing on knowledge of photography, the history and geography of Sheboygan, WI, and analysis of the shadows cast by a sundial in the picture, we were able to determine that the photo was taken at approximately 4:48 p.m., on August 10, 1873 or August 10, 1879. The appearance of a full-sized locomotive in the photograph not only confirms the location as the intersection of 8th and Griffith Aves in Sheboygan, but also supports the fact that a wide-angle lens was used to take the picture. However, the identity of the man and the motive for his unique pose remain unknown.



Figure 2. Location in Sheboygan of the man in the photograph.

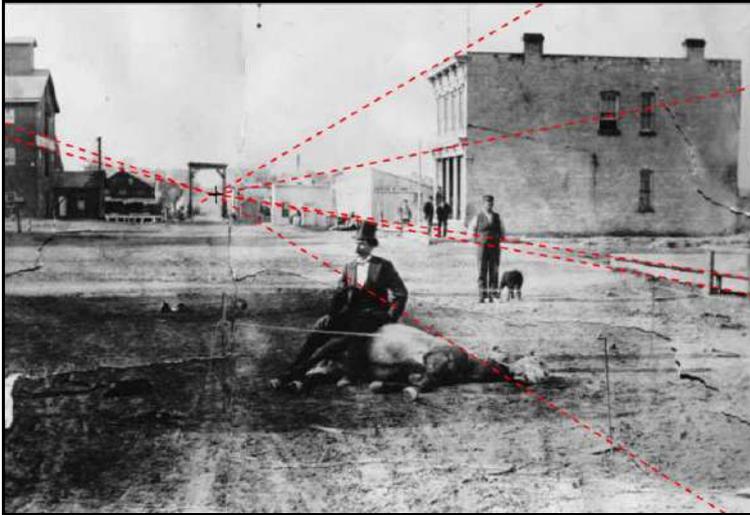


Figure 3. Lines of perspective.

the shadow of a building located to the left, out of the field of view of the camera. The area of the street around him has been roped off. A hammer along with the bridle of the horse appears on the ground to the left of the cordoned area. In the distance, there are several buildings, identified by the Center as a grain elevator (background left), and the Evergreen Hotel (northeast corner of intersection). The Evergreen has an outline of a shed on its south-facing wall, which was apparently removed at an earlier date to clear a path for Indiana Ave.

Early theories to explain this bizarre scene included the result of a tornado that struck Sheboygan while a horse show was in town in 1901. Another theory that was advanced stated that the owners of the Sheboygan tannery were staking their claim to the hide after a horse had died in the street.

We first drew the lines of perspective to provide a geometrical context for our analysis of the picture. As shown in Figure 3, the vanishing point is just inside the gantry and to the left of center of the photograph. This implies that a portion of the image projected by the lens must have lay beyond the left edge of the picture and that the photographic plate was positioned in the camera off-center, in order to frame the scene. The façade of the Evergreen Hotel and the edges of the construction platform on the southeast corner provide lines of perspective to the right, with the façade of the grain elevator providing lines of perspective to the left. Another line runs across the top of the shadow in which the man in seated, indicating the shadow is the projection of a building located to the left, out of the field of view of the camera. As the vanishing point is not far from the center of the gantry, the midline of the street can be approximated as a line extending from the center of the gantry, normal to the bottom edge of the picture. See Figure 4.

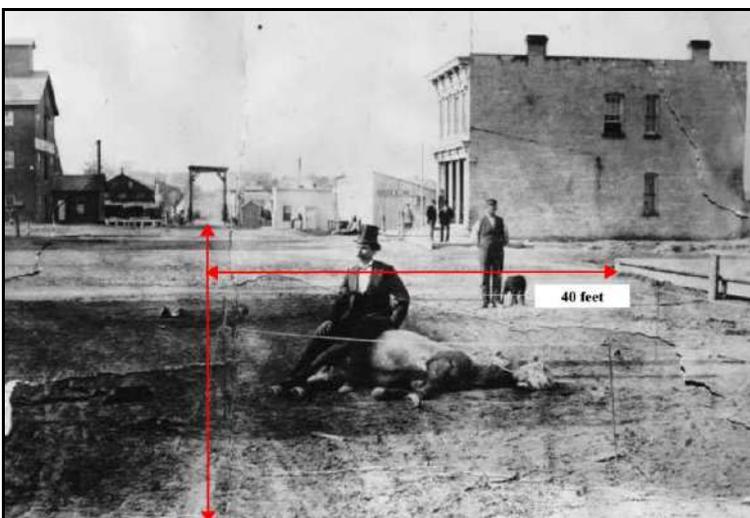


Figure 4. The street is 40 feet wide.

Introduction

A 1200 dpi high resolution version of the photograph in Figure 1 was obtained from Beth Dibble, the Director of the Sheboygan County Historical Research Center (SCHRC) in Sheboygan Falls, WI. Although neither the provenance nor the date of the photograph was known, the location was identified by the Center as the intersection of Griffith (now S. 8th) and Indiana Ave. in Sheboygan, with the camera facing north through a wooden gantry securing the bridge spanning the Sheboygan River. A map of the area is shown in Figure 2.

The man in the center of the photograph is seated on what appears to be a dead horse, in

the shadow of a building located to the left, out of the field of view of the camera. The area of the street around him has been roped off. A hammer along with the bridle of the horse appears on the ground to the left of the cordoned area. In the distance, there are several buildings, identified by the Center as a grain elevator (background left), and the Evergreen Hotel (northeast corner of intersection). The Evergreen has an outline of a shed on its south-facing wall, which was apparently removed at an earlier date to clear a path for Indiana Ave.

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The Earliest and Latest Years the Photograph Could Have Been Taken

Based on the geometry provided by the lines of perspective, it was possible to characterize the type of lens used to take the photograph, leading to an earliest possible date it could have been taken.

The 1884 Sanborn Fire Insurance Map of Sheboygan (Figure 5) indicates that Griffith Ave. was 80 feet wide. The 40-foot half-width of the street is described in Figure 4 by a line perpendicular to the midline and extending from the midline at the wooden platform to the right. The photographer does not appear to be far from the scene. His

distance can be estimated by noting that the building casting the shadow appears to be about 30 feet wide when compared to the 80-foot width of the street as shown on the map. Note that the corners of the building correspond to the two relatively long shadows extending across the street from the top of the building's silhouette. One of these shadows can be seen behind the man with the dog, with the other located just up-street from the horse's head. The building was probably under construction; the shadows were probably part of the posts used to frame the corners of an upper floor. Note that the width of the building does not account for the full width of the shadow. There is apparently a structure next to it to the south, perhaps a scaffold or a tree, which makes the shadow of the building appear wider.

The photographer was apparently about two building widths from the top edge of the shadow, or about 60 feet away. The angular field of view of the lens Θ_{lens} that was used to capture this scene can be approximated as:

$$\text{Eq. 1} \quad \Theta_{\text{lens}} = 2 * \tan^{-1} (w_s/d_c) = 2 * \tan^{-1} (40/60) = 67^\circ$$

where w_s is the half width of the field of view, or about the width of the street, and d_c is the distance of the camera from the top edge of the building's shadow. This large angular field of view is characteristic of wide-angle lenses, which typically have angular fields of view ranging from 64° to 84° degrees.¹

The first commercially available wide-angle lens, known as the Pantoscop, was produced in 1865 in Rathenow, Germany by Emil Busch.² See Figure 6. Although it was first used for commercial purposes in 1867 by Albrecht Meydenbauer for photogrammic documentation of buildings and cityscapes³, it was not in common use even in the 1880s. The earliest year the photo could have been taken is 1865.

The latest date for the photograph was obtained from knowledge of Sheboygan's history.

The style of the gantry over the entrance to the Sheboygan River Bridge is that of a truss swinging bridge, with the gantry used as the anchor for the trusses. According to *One Hundred Years of Sheboygan, 1846-1946*, by J. E. Leberman, the bridge was constructed in 1846 and rebuilt in 1869, 1881, and 1893. A sketch of the bridge from 1888 in *Sheboygan centennial celebration, 1853-1953: official souvenir program and*

historic booklet, August 9th thru 15th, 1953 clearly shows a bridge of a different design without a gantry.⁴ See Figure 7. The gantry must have been removed before 1888 during an earlier renovation, giving 1881 as the latest date for the photo.

The date can be improved upon somewhat using information provided by the Sanborn map and United States census records. The 1884 Sanborn map (Figure 5) indicates that the northwest and southwest corners of the intersection of Griffith and Indiana Ave. were occupied by saloons, indicated on the map by the abbreviation "sal". This is confirmed by the United States 1880 census records for Sheboygan.⁵ Yet, the shadow that is falling on the man and the horse is not cast by a building at the end of the block; it is cast by the building second from the end. The corner is empty.

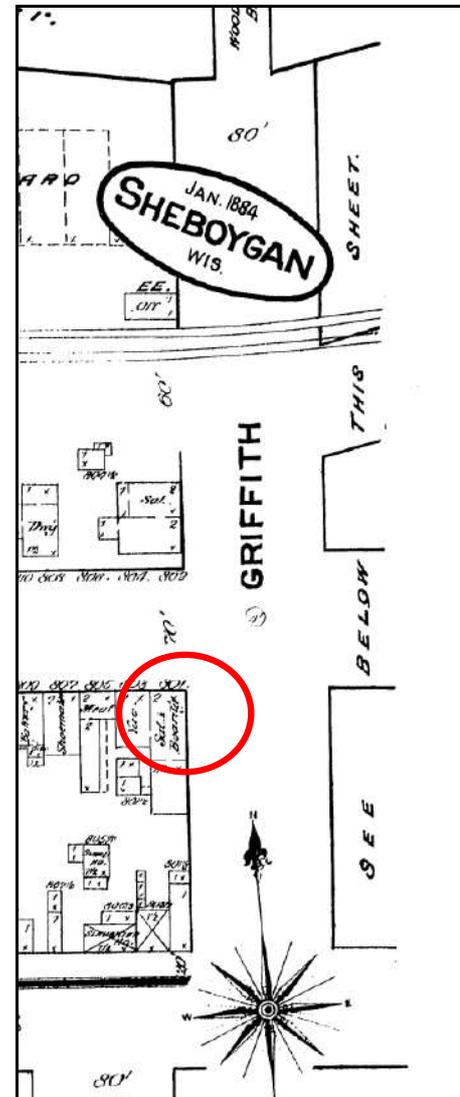


Figure 5. 1884 Sheboygan Sanborn Fire Insurance Map showing the intersection of Griffith and Indiana Aves. Note saloons (indicated by "sal") on the northwest and southwest corners. Circle indicates 1 1/2 story building.



Figure 6. Emil Busch's Pantoscop.



Figure 7.

Therefore, the picture must have been taken before June 7, 1880, the day the census was recorded for the intersection.

Note that the lengths of the shadows of the framing posts that define the corners of the building are half the length of the shadow of the building itself, presumed to be a single story high. See Figure 8. Therefore, the total height of the completed building was to be 1½ stories high, consistent with the structure shown second from the corner on the 1884 Sanborn map. This confirms that the posts were probably part of the building’s frame during its construction prior to 1880.

Calculation of Time of Day and Day of the Year

The time of day and the day of the year were calculated thanks to a fortuitous alignment of the sun at the moment of exposure. According to the Sanborn map, the building faces due west; its shadow and the shadows of the framing posts seem to point due east, as does the shadow of the man with his hat, just down-street from the shadow of the south framing post. The sun is therefore due west, at azimuth 270°. The elevation of the sun Θ_e can be calculated by treating the man on the horse as a sundial (Figure 9) with

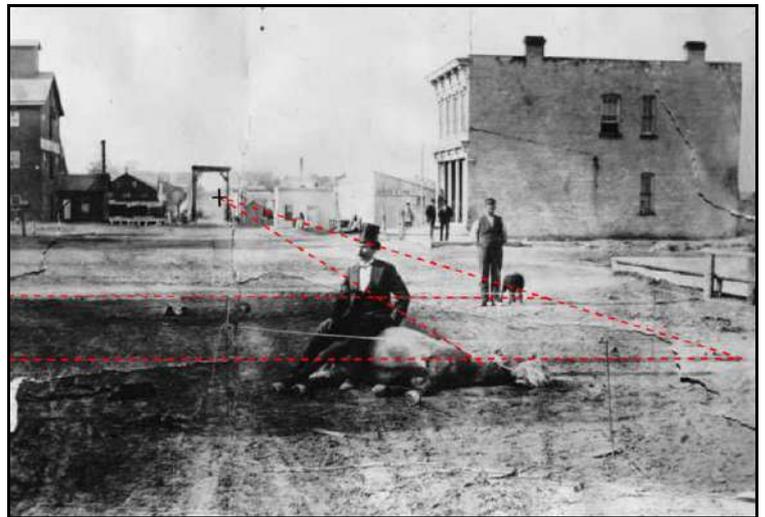


Figure 8. The building casting the shadow is 1½ stories high.

Eq. 2

$$\Theta_e = \tan^{-1} (h/d)$$

where h is the height of the upper edge of the hat from the ground, and d is the distance along the width of the street to the tip of the hat’s shadow. Note that the fact that the camera is apparently pointing due north along Griffith Ave., eliminates the need to correct for parallax in measuring the lengths of the shadows.

Using a high-resolution version of the picture gives the relative values for the sides of the triangle as h = 729 units, and d = 301 units. However, there is a tear in the picture, which artificially lengthens the base. Fortunately, there is a post stuck in the ground that spans the tear, providing a correction factor for the offset of 8 units. See Figure 10. The final values of

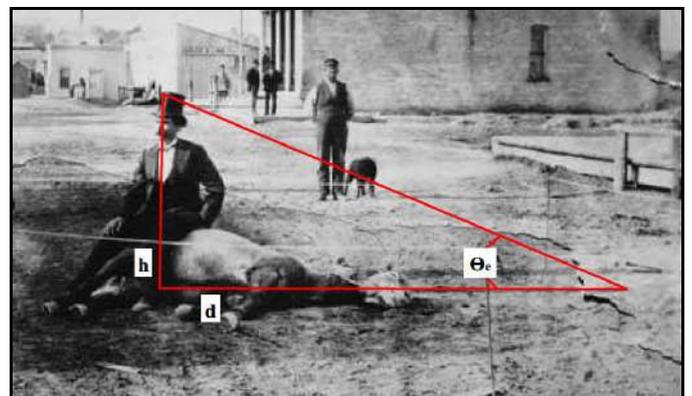


Figure 9. Calculation of the elevation of the sun based on the man’s shadow.

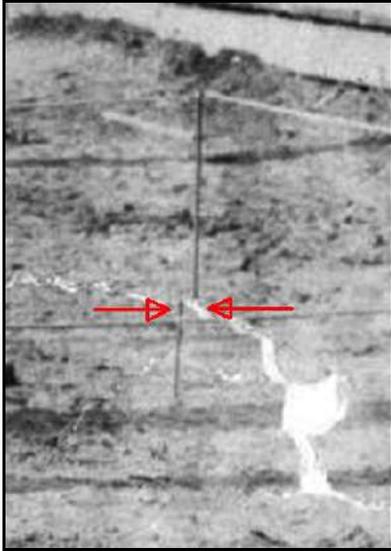


Figure 10. The post crosses a tear in the photograph.

h and d are $h = 729 - 8$ and $d = 301$; Eq. 1 yields $\Theta_e = 22.85^\circ$.

The calculation of the time of day and day of the year also requires the latitude of the position of the man who is the source of the shadow. His GPS coordinates can be obtained from Google Maps as $43^\circ 46' N, 87^\circ 42' W$.

The United States Naval Observatory (USNO) Astronomical Applications Department Sun Azimuth/Altitude Table⁶ can be used to generate solar elevation and azimuth data at one-minute intervals for any given date, for years between 1700 and 2100, and for any latitude and longitude. Because we already knew the position of the sun in the picture but wished to find the associated time of day and day of the year, we input a date into the USNO calculator, and then checked the corresponding elevation and azimuth for each minute during that date to find the time in the afternoon when the sun is closest to the desired altitude of 22.8° . (The calculator only outputs elevation angles accurate to a tenth of a degree). If the solar azimuth corresponding to this elevation was not 270° , we repeated the process with a new input date, until we discovered a date and time that yielded both coordinates.

To facilitate the calculation, we graphed the time of day when the solar elevation is 22.8° versus the day of the year using 1871 as a nominal year. See Figure 11. We plotted a second curve on the same graph, indicating the time of day when the solar azimuth is located at 270° . The intersection of the two lines shows that both conditions are met at about 4:48 pm on August 10. Similar calculations show that the same conditions occur earlier in the year on May 5 at 4:39 pm.

Our calculation includes several approximations. The USNO calculator outputs data only in one-minute increments, with solar elevations and azimuths expressed in tenths of a degree; our time estimates were based on an elevation of 22.8° (not 22.85° , as required by the photograph). The calculation is also heavily dependent on the shadow-length values used to estimate the solar elevation at the time of the photo, and on the assumption that the shadows are pointing due east. A higher resolution photograph would probably give a slightly different answer.

According to the SCHRC, the Evergreen Hotel included a saloon as far back as our earliest date of 1865, yet the street appears to be deserted. The area was also an industrial part of town. Because of there are so few people in the street, we made the reasonable assumption that the photo was taken on a Sunday. We used a perpetual calendar⁷ to narrow the date for the photograph to only five years between 1865 and 1880 when May 5 or August 10 occurred on a Sunday. May 5 was a Sunday in 1867, 1872, and 1878. August 10 fell on a Sunday twice, in 1873 and 1879.

There is one more clue that we used to narrow the date even further – the weather. Since the tree to the left in the background seems to be in full foliage, the photo must have been taken during the time of the year when Sheboygan experiences warmer weather. See Figure 12. Historical data for the daily and the average monthly temperatures for Sheboygan in the 1860s and 1870s was not available for this article and it is possible that the picture was taken during a year when the town experienced warmer than usual weather. However, if we assume that the climate

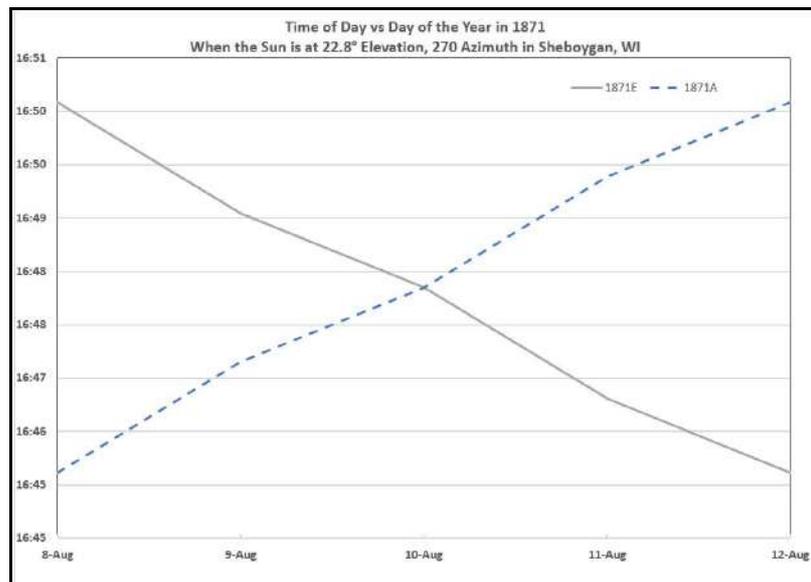


Figure 11. Time of day versus day of the year when the sun is at 22.8° elevation (solid line) and 270° azimuth (dotted line) for August 1871. The lines cross at August 10. A similar graph can be produced for May 5.



Figure 12. The tree appears to be in full foliage.

in that area has not changed much over the last 150 years, we can use the average temperatures for 1981-2010 provided by the Midwestern Regional Climate Center (MRCC)⁸ to determine probable weather conditions for April-May and July-August 1871. These appear in Table I.

With temperatures averaging 44.7° for April, and 55.6° for May, it is unlikely that the tree in the background would be full of leaves as early as May 5, so we can probably rule out this date. August 10 is more likely, as the tree would have had time to foliate during the summer, with average temperatures of 70.6° and 68.8° for July and August, respectively.

Based on the shadows, the assumption that the picture was taken on a Sunday, and the average monthly temperatures for Sheboygan, we conclude that the picture was probably taken at 4:48 p.m. on either August 10, 1873 or August 10, 1879.

Table 1. Average Temperatures for Sheboygan, WI, 1981-2010.^{vii}

	April	May	June	July	August
Maximum (°F)	54.8	66.2	76.3	80.8	78.7
Minimum (°F)	34.7	45.0	55.1	60.4	58.9
Mean (°F)	44.7	55.6	65.7	70.6	68.8

Hidden Locomotive

There is one additional item of interest – a full sized locomotive that appears in the photograph, but which is obscured by the effects of using a wide-angle lens used to take the picture.

Library of Congress maps and Sheboygan historical publications document that the railroad was completed through Sheboygan in the early 1860s, and later Sanborn maps, including the 1884 version shown in Figure 5, indicate the tracks ran across Griffith Ave. near the river. Sheboygan was an important depot for the Fond du Lac and Sheboygan railroad in the mid-1870s.⁹ An article in the *Oshkosh Daily Northwestern* on Friday, October 15, 1875 reported that the Williamson, McKenzie & Crawford Co. had unloaded fifteen thousand tons of coal and wood from vessels into railcars at Sheboygan for transport to Fond du Lac, where the cargo was shipped out by barge via the Wolf River and Lake Winnebago. Railroad tracks should appear crossing the road in front of the gantry during the time period calculated for the photograph, 1865-1880. Yet no tracks are apparent.

The use of a wide-angle lens probably explains this discrepancy. Evidence for a rail line can be observed as part of the A-frame building in the background to the left of the gantry. The building appears to have three windows in a horizontal row, the left one of which is eclipsed by the shed in front of it. The right edge of the house's sloped roof appears cut off by a white chimney. There is a thick white line that zigzags below the windows from the shed to the chimney.

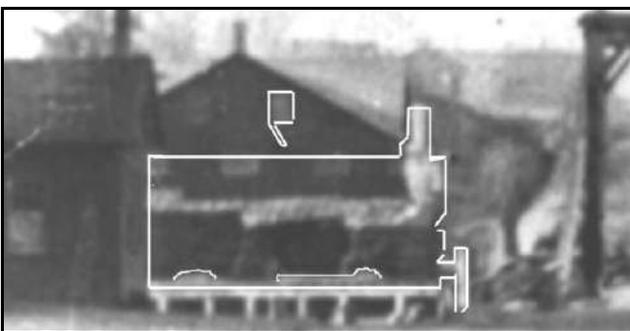


Figure 13. The locomotive.

On closer examination, it can be seen that the white chimney is the smokestack of a locomotive. The zigzagging white line could be the joint between the top and the bottom halves of its boiler. The thick white line nearer the ground is the bottom of the locomotive frame; the horizontal lines below it are glints from its wheels. The white square near the top right of the A-frame building is the semaphore on the other side of the tracks used to signal the train. There is steam from the engine billowing in front of the locomotive. The shed in front of the tracks and the A-frame house behind the tracks could be part of a train depot.

The locomotive is hard to see, since using a wide-angle lens tends to distort distances, with objects in the foreground appearing to be closer to the camera and more well-separated, with objects in the background appearing further away and closer together. The outline of the locomotive is shown in Figure 13.

To confirm our conclusions, we researched the type of locomotive and consulted with two locomotive historians.

Figure 14 depicts a locomotive known as the Cyfarthfa, a Penydarren steam engine used by the Cyfarthfa Iron Works in Australia. The Cyfarthfa was built in 1870.¹⁰ It resembles our mystery engine with its short smokestack, and long body. It also has a platform on the front instead of a cowcatcher.

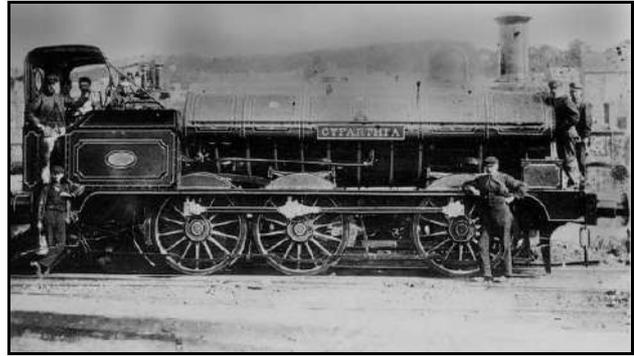


Figure 14. The Cyfarthfa.

To check its proportions, we compared its height of the engine boiler to the door of the shed on the right of the gantry, which was probably about the height of a person. As shown in Figure 15, if a man were to stand on the front platform of the engine, his head would be a little higher than the top of the boiler. This is consistent with the height of the man standing on the platform on the front of the Cyfarthfa.

Surprisingly, the experts we consulted were not at all in agreement about whether the image was that of a locomotive. We consulted with Lee Witten, Secretary of the Golden Spike Chapter of the Railway and Locomotive Historical Society in Ogden, UT, and with Bob Kreiger, the Vice President of the Union Pacific Historical Society in Cheyenne, WY.

Lee was not convinced he saw a locomotive in the picture. According to Mr. Witten:

The picture of the Australian locomotive does not look like anything that an American railroad would have used at that time, at least from what I've seen and read but that's not a conclusive argument on my part. Even if it was like the Australian engine, the pattern of the shadows and that zigzag line simply don't jive with what you would expect of a cylindrical boiler with domes on it. I'm just not totally convinced it's a locomotive.

On the other hand, Mr. Kreiger not only believed he saw a locomotive, he even thought he knew the type:

Though it's very difficult to see, it would appear by its vague shape to be a small 0-6-0 tank engine used for moving cars about at a yard or docks. No way to know which railroad.

Summary

Based on historical records of Sheboygan, the length and position of shadows in the picture, and average monthly temperatures for Sheboygan, we have determined that the Sheboygan Dead Horse Photograph was probably taken at 4:48 p.m. on either August 10, 1873, or August 10, 1879. This estimate could be refined by using a higher resolution version of the photograph, along with a solar calculator that accepts higher precision data. We have confirmed that the scene was located at the intersection of Griffith and Indiana Ave., in Sheboygan, WI, based on the presence of a full-sized locomotive positioned in front of the gantry across the Sheboygan River. The photographer used a wide-angle lens to take the picture.

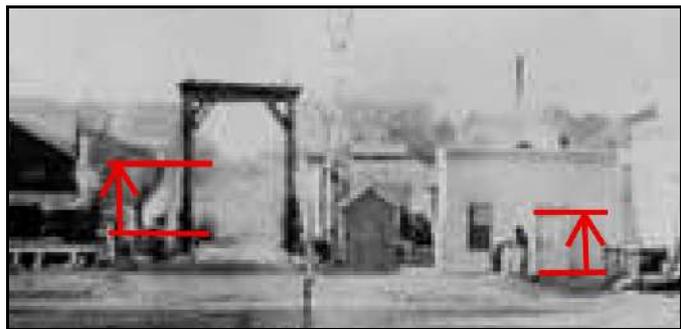


Figure 15. The mystery engine is about the same height as that of a person.

Only two questions remain to be answered about the photograph. Who is the man and why was he photographed in top hat and tails sitting on a dead horse in the middle of Griffith Ave. in Sheboygan, WI?

Acknowledgements

The author wishes to thank to the Sheboygan Historical Research Center for allowing the use of the Dead Horse picture for this article. We also thank Roger Bailey and Steve Lelievre of the sundial community for their help with understanding the calculations of time of day and day of the year based on solar azimuth and elevation.

¹ en.wikipedia.org/wiki/Wide-angle_lens

² www.camerapedia.org/wiki/Emil_Busch

³ www.hasler.net/Meydenb.pdf

⁴ Sheboygan centennial celebration, 1853-1953: official souvenir program and historic booklet, August 9th thru 15th, 1953

⁵ Year: 1880; Census Place: Sheboygan, Sheboygan, Wisconsin; Roll: 1447; Page: 270B; Enumeration District: 216

⁶ aa.usno.navy.mil/data/docs/AltAz.php

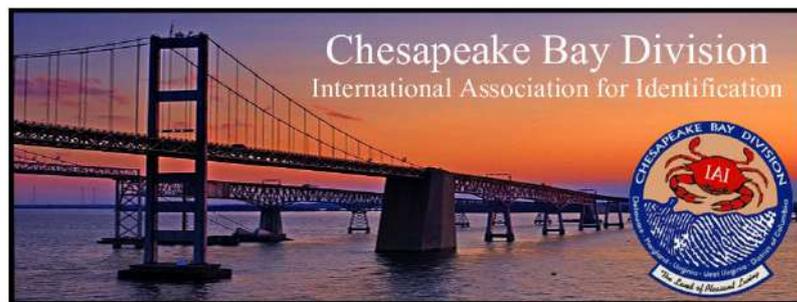
⁷ See www.wiskit.com/calendar.html for example.

⁸ Midwest Regional Climate Center,

mrcc.isws.illinois.edu/mw_climate/climateSummaries/climSummOut_temp.jsp?stnId=USC00476678

⁹ Joerns Brothers / Illustrated historical atlas of Sheboygan County, (1902), The State of Wisconsin Collection, Travel and transportation, p. 17

¹⁰ www.epolitix.com/EN/MPWebsites/Dai+Havard/cadd7449-f6b8-40ac-9e17-6b1fd8649977.htm



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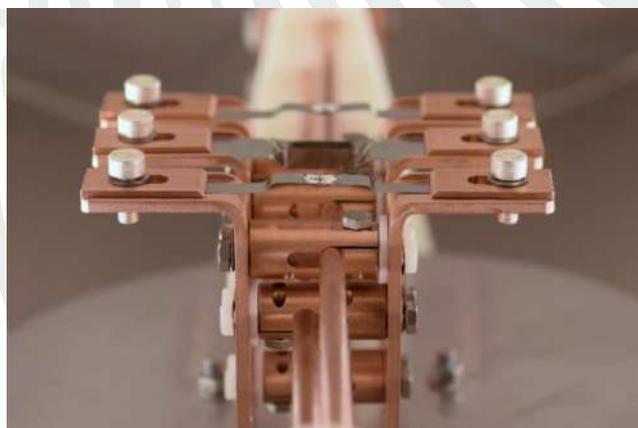
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