

FIREPOINT



IAAI JOURNAL



Firepoint

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EDITORIAL

In this issue we include a major case study by the respected American fire investigator, John Lentini. The case he argues is thought provoking, but it has drawn out many critics, as well as those who have seen it as important. It raises many issues fire investigators encounter, as professionals from different areas interact.

The Victorian Newsletter provides a detailed account of the protocols and methodology used in that state in fire investigations. The interaction of people from different areas is noted, and an attempt made to definitively define their roles.

The NSW FIU Report presents a major breakthrough in the re-establishment of communications between that fine group and the wider communication. It is good news to see common sense prevailing over bureaucracy.

What a diverse group of people there are involved in a fire scene. Amongst those I have encountered have been fire brigade staff, police, insurance staff, investigators of many types, and lawyers, but at times also social workers, ambulance staff, press reporters and coroners, as well as curious sightseers, victims and neighbours. They all have a different role, yet they need to work together in a constructive, effective and harmonious way. Not easy, and not always achieved.

It is our responsibility to try and see we can work together better, since we all share the same objectives: to find out as accurately as possible what happened at each fire scene we attend.

Wal Stern

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QUEENSLAND NEWS

MEMBERSHIP

The Chapter Committee welcomes the following new members to the Queensland Chapter:

- Tony Lorimer - Suncorp Insurance & Finance
- Philip Scanlon - Barrington Group
- Pat Goddard - Patricks Jewellery
- Charles Meng - O'Brien Glass
- Bill Clarke - Crawford THG Pty Ltd
- John Davies - John Davies Fire Consultancies
- Ross James - McLarens Toplis

All members should be aware that fees for the Queensland Chapter for 1998 are now due. Reminder notices will be forwarded in February.

ANNUAL GENERAL MEETING

The AGM of the Queensland Chapter will be held on Wednesday 25th March 1998. Venue details etc. will be forwarded to members shortly.

QUEENSLAND THEME 1998

"A MAJOR INDUSTRIAL LOSS"

The Committee of the Queensland Chapter has resolved to adopt an all-year theme for 1998. Our major project is intended involve the destruction of an industrial structure and we will be looking at the various issues which involve such a major loss. These issues involve input from experts in the following areas:-

- Structural Engineers
- HAZCHEM

- Workplace Health & Safety
- Pollution
- Mines Dept. - Gas Examiners
- Fire Protection Engineers - Sprinkler installations.
- Local Authority - Guidelines, input and legislation
- Insurance liability - legal considerations.

The Qld Chapter will be holding three (3) breakfast meetings prior to the major project and one (1) following. Our "Theme" in mind, breakfast meetings will be directed towards this major project with speakers from both private companies and statutory authorities addressing the specific issues needed to be addressed following such a loss.

A Co-ordinator for the major project has already been appointed, and following the elections for committee positions, a more detailed program will be announced.

The proposed program and major project for Queensland this year will provide great interest for both members of our own local Chapter and of other Australian and New Zealand Chapters, and we anticipate that there will be an immense benefit derived from the face-to-face interaction between members of the various authorities, insurers, lawyers, private forensic and engineering firms.

1998 ACTIVITIES

Please take the opportunity to note the dates of the following activities in your diary:-

Breakfast Meetings

- **Tue 24 February** - *Charity breakfast with guest speaker Danny Hoyland OAM, 4BC Radio. Profits will be donated to Queensland Lifesaving.*

- **Tue 28 April** - *Major Project Theme.*
- **Tue 23 June** - *Major Project Theme.*
- **Tue 18 August** - *Major Project Theme.*
- **Tue 20 October** - *Major Project Theme "Insurance Liability - Legal Considerations".*

Major Project

- **Wed 16 to Fri 18 September** - *3 Day Seminar. "A Major Industrial Loss"*

Social Function

- **Fri 4 December** - *Xmas function.*

QLD NEWSLETTER

The Queensland Newsletter has now been in production for eight months and has received enormous support throughout Queensland.

A lot of hard work goes into producing the monthly newsletter and the Queensland Committee would like to take this opportunity to thank Bernice Norman for her time and effort as Editor of the newsletter.

We would also like to thank our sponsors:-

- Wyatt Gallagher Bassett
- FAI Insurance
- Mullins Emergency & Restoration Services
- Zurich Australian Insurance
- Suncorp Insurance & Finance
- Patricks Jewellery
- O'Brien Glass
- McLarens Forensic

If you wish to contribute to the Queensland Newsletter in 1998

either as a sponsor or by submitting an article, please contact Bernice Norman on (07) 3831 1900.

QAFI ON THE WORLD WIDE WEB

At the last meeting in December 1997 of the QAFI Committee, it was agreed that the Association would embrace the future and proceed with our own Web Site.

Sgt. Geoff Nufer accepted the position of Co-Ordinator for this important project.

Further details will be advised.

EXPRESSIONS OF INTEREST

Mobile Safety Facility

The Electrical Safety Office of the Department of Mines & Energy and the Queensland Fire & Rescue Authority are seeking sponsors for a mobile safety facility promoting electrical and fire safety awareness throughout Queensland.

The Semi-trailer based facility will operate primarily in regional Queensland, visiting regional shows, special events, major activities and schools in conjunction with the Fire & Rescue Authority and Electrical Safety Office in conjunction with Electrical Corporations.

The program is planned to commence in February 1998 and will be supported by a media advertising campaign.

Potential sponsors seeking further information should contact Mr Peter Owen on the following numbers:-

Phone: (07) 3237 0218
Fax: (07) 3237 0229

E-Mail: powen@dme.qld.gov.au

The semi-trailer side drops down to give a stage like effect. This then allows for the public to walk through a series of static and mobile displays including:-

- electrical work / maintenance
- first aid
- hot water protections using shut down valve
- Rural fires
- Overhead power lines
- Safety switches
- House wiring
- Sprinkler systems
- Alarm systems
- Gas safety

The semi-trailer will carry the sponsors names on the outside of the truck. The area that the semi will cover will provide an enormous marketing tool to interested parties.

When this semi attends shows, schools etc., it will be accompanied by fire trucks, ambulances etc.

This whole concept is a very unique opportunity for any interested parties to gain coverage throughout rural Queensland.

NEW SECTION INSERTED IN CRIMINAL CODE

Section 478 - Sending letters threatening to burn or destroy. Any person who, knowing the contents of the document, causes any person to receive any document threatening that any building or vessel, whether complete or not, or any stack of cultivated vegetable produce, or any such produce that is in or under a building, shall be burnt or destroyed is guilty of a crime, and is liable to imprisonment for

7 years.

Commentary on Section 478 - It is sufficient if the writing contains a threat even though the accused person did not intend to carry out the threat. See *R v Syme*.

Q.F.R.A. STATISTICAL INFORMATION

Almost half of all calls received by the Qld Fire & Rescue Authority between July 1, 1996 and May 30, 1997 were false alarms, QFRA statistics have revealed.

Figures collected by the QFRA's Statistical Information Section showed that 48% of all calls during those 11 months were false alarms.

During the same period, fire (grass, structure and other fires) constituted 32% of total call outs while motor vehicle accidents accounted for 10%, hazardous incidents 2% and other calls 8%.

In total, more than 37,000 calls were received.

Incident Statistics

Fatalities at Fires:

Structure	7
Grass, bush	5
Mobile Property	10
Other	0

GOOD FOR A GRIN

"How you know it is going to be a rotten Day"

- You wake up and discover your waterbed broke and then realise that you don't have a waterbed.
- Your income tax cheque bounces.
- Your wife says, "Good morning Bill" and your name is George.

ASSOCIATION OF FIRE INVESTIGATORS (NSW)

1998 CONFERENCE

Venue: SWISS GRAND HOTEL
Campbell Pde.,
Bondi, Sydney.

Date: 23 & 24 July 1998.

Cost: \$395.00 member
\$450.00 non member

Speakers: Mr. N. Cowdery Q.C. The role of the D.P.P. in fire investigations.

Ms. J. Wright. D.P.P. Prosecutor. A Case study.

Mr. N Barnes. Fire Investigation Scientist. C.F.A. Vic. Bush fire investigation.

* Mr. R. Corry. American Re Insurance Co. Presentation of 4 papers.

* Mr. P. Beering. Attorney at Law.

There will be two other speakers, including a session on
"Keeping fit and alert at conferences".

- * Mr. Robert Corry is a Director & Fire Investigation specialist in the Property Claims Division, American ReIns. He was a Police Officer with the Massachusetts State Police for 23 years, the last 15 years served in the State Fire Marshalls Office. He has been a principle developer of several arson training programs and lectures on fire/arson investigation, criminal investigation and other fire related topics at the National Fire Academy and the F.B.I. academy.
- * Mr Peter Beering is General Counsel for the Indianapolis Dept. of Public Safety. He is a prosecuting attorney and has been an officer, and fire investigator with the Washington Town Fire Dept. Ind. for 19 years. Several articles written by Mr. Beering have been published in Fire magazines in America. He is also the primary author of the Advanced Cause & Origin course conducted by A.T.F. in America.

Additional information regarding the conference will be forwarded to
all members when the program is finalised.

VICTORIAN NEWS

Welcome to the Victorian Chapter Report. We hope that all our membership has had a safe and rewarding break. Both the Editor of Firepoint and myself are always looking for articles that would be of interest to other members, so if you have a different case, article or short story don't hesitate to show us.

Membership

The Victorian Chapter committee and members welcome the following new members to the Chapter :

Don Tomkins
David Shaw
Wayne Edwards
Rachael Thompson
Sean Curtin
Brendan Johnston
Darren Treloar
Stephen Cato
Peter Di Biase
Neil Bennett
Michael Sheeran
Darrly Martin
Paul Aguirre
Pino Mucilli
David Jenkins
Sophie Arslan

The committee gives a special welcome to the new members from GIO Insurance, Melbourne

Office. This increase in membership is pleasing to see and should inspire all members to seek and encourage new membership. It has come to the notice of the committee that several members have not been issued with their Chapter certificate and would advise those members to contact any of the committee.

News from the Chapter Committee

Over the past few months the committee has worked together to produce an entertaining and educational program for the Chapter and members who will be notified as events are finalised. There is still a vacancy on the committee and any member may apply or enquire through any of the committee members. A revamp of administration will hopefully produce an up to date members list which will be forwarded to all current financial members together with accounts and receipts to all members. It is requested that any members with any

suggestions or comments should forward them to the Secretary so that they could be incorporated in the Chapter Activities.

Program for 1998

The following is the proposed program for the Chapter for 1998 :

May 1998
Coroners Court

July 1998
Annual General Meeting and Speaker

September 1998
Seminar

November 1998
Dinner Night TBA

Any member interested in being part of the Seminar Committee contact the Secretary as we are wanting to involve the membership in selection and format of the Seminar to meet the needs of the membership. The committee has some ideas at present and the Seminar sub-committee will be formed by the end of March.

DECKENFLURTER, HALOGEN FLOOR LAMP

The Metropolitan Fire & Emergency Services Board (MFESB) Fire Investigation & Analysis Unit has undertaken tests on a Deckenflurter brand domestic Halexon Floor Lamp, currently on sale throughout Victoria. This floor lamp is free standing with a shallow up-turned bowl-shaped light fixture mounted on top of a 1.8 metre pole and illuminated by a tubular halexon bulb.

This is similar to those tested in the United States under a voluntary in the home consumer repair program. Information from the United States was that this style of lights has been responsible for at least 11 deaths and 189 fires since 1992. Concerns include : the heat generated by the tubular halexon globe, the open up-turned bowl-shaped light fixture, the instability of the unit and the instructions provided with the unit.

The tests mention, caused the ignition of curtain material, paper and a toy teddy bear in approximately 15 seconds after contact with the halexon lamp.

All members should be

aware of this report. Further information can be obtained by contacting the MFESB. FIA on 613 9420 3883 Fax 613 9420 3886 or writing to : 619 Victoria Street Abbotsford Victoria 3067.

VICTORIAN FIRE INVESTIGATION POLICY & PROCEDURES 1994

During 1992, following a coronial enquiry the Deputy State Coroner recommended greater levels of co-operation between agencies and Authorities involved in fire investigation. In January 1993 a Working Party was established to review the procedures throughout Victoria.

The agencies involved were Department of Conservation and Natural Resources, State Forensic Science Laboratories, Victoria Police, Country Fire Authority and Metropolitan Fire Brigades Board with each agency submitting their corporate objectives for Community Safety through the investigation of fire.

A set of Operational Policies for Fire Investigation was introduced in 1994 and have been in place since

then. These procedures have proven to be invaluable in the co-operation between agencies and we believe that this approach has increased the awareness and reduction of arson within Victoria. Produced below are the set of procedures :

OPERATIONAL POLICIES FOR FIRE INVESTIGATION

It is recommended that there be 2 protocols followed in fire investigation : one for Coronial investigations and one for all other investigations.

CORONIAL INVESTIGATIONS

1. Fire scenes are under the command of the Fire service, and the outer perimeter of the scene should be secured by the local Police until the fire poses no further danger.

2. Immediately upon arrival at the scene of the fire, the Senior Victoria Police investigator and the SFSL personnel confer with the senior member of the relevant Fire Service Investigation Section to decide respective roles

and responsibilities.

Co-ordination at the Scene - Coroner or his representative (Senior Victoria Police member)

Scene Investigation Cause & Origin - SFSL and relevant fire service investigator

3. Once the fire poses no further danger, control of the fire scene investigation is passed to the Victoria Police, and the examination of the scene is conducted using a team* approach.

4. To expedite the attendance of the on-call Arson Squad team at the scene of fires involving death or life threatening injury, the relevant Fire Service Investigation Section notifies on-line Supervisor at D24 Melbourne.

5. When a previously suspicious fire is found to be non-suspicious as a result of scientific examination of materials taken from the scene, the Officer in Charge of the SFSL - Fire & Explosion Examination Section, formally advises the Officer in Charge of the relevant Fire Service Investigation Section and provides that section with relevant

documentation. Exhibits are made available

6. Where activities of a serial arsonist come to the attention of either the Fire Service Fire Investigation Section or the Victoria Police, immediate contact, in writing, is to be made with the team* to ensure that they are also aware of the connections made between the incidents.

7.1 If media require information relative to a fire, only the Fire Service will make statements to the media. However, no comment is to be made relative to cause unless in the public interest and only after consultation with the investigating officer.

7.2 If media require information relative to a suspicious fire, only the Victoria Police are to make statements to the media relative to the cause.

7.3 If the media require information relative to a fire under joint investigation by the team* the relevant agencies are to determine the appropriate representative/s to make statements to the media. Media enquires are then to be directed to the relevant investigation representative/s.

8. When on scene, prior to conducting any investigation or removing samples from the scene, any representative of an external organisation is to be directed to contact the team*.

ALL OTHER FIRE INVESTIGATIONS

1. Fire scenes are under the command of the Fire Service, and the outer perimeter of the scene is to be secured by the local Police until the fire poses no further danger.

2. Immediately upon arrival at the scene of the fire, the Senior Police member/SFSL personnel should confer with the senior member of the relevant Fire Service Fire investigation Section/Incident Controller to decide respective roles and responsibilities.

Cause Undetermined

Co-ordination of Scene - Fire Service Incident Controller

Control of Scene Investigation - Responsibility of relevant Fire Service Fire Investigator

Suspicious Fires

Co-ordination of Scene - Senior Victoria Police member

Control of Scene Investigation Cause and Origin - SFSL is to be contacted through the Arson Squad to determine their attendance.

Where SFSL is on-scene, co-ordination rests with SFSL with assistance of the relevant fire service investigator if required.

Where SFSL is unavailable, the fire service investigator is to conduct site investigation liaising with the senior Victoria Police member

Where samples are to be taken by agency personnel other than SFSL, co-ordination is required with SFSL prior to taking samples.

3. Once the fire poses no further danger, control of the fire scene investigation passes to the following:

Suspicious - Victoria Police

All other - Fire service

In these circumstances, prior to SFSL being responded, the scene is to be assessed by a qualified fire service investigator who liaises with the local CIB Detective.

In the case of fires with the jurisdiction of Department of Conservation and Natural Resources, CNR is to conduct its own investigations assisted by other agencies upon request.

4. When a previously suspicious fire is found to be non suspicious as a result of scientific examination of materials taken from the scene, the Officer in Charge of the SFSL, Fire & Explosion Examination Section, is to formally advise the Officer in Charge of the relevant Fire Service Fire Investigation Section and provide that Section with relevant documentation.

Exhibits are to be made available for examination by the Fire Service Fire Investigation Section following consultation with the informant.

When previously unknown fire is found to be suspicious, the Fire Service investigator is to remain in control of the scene until such time as a

member of the Victoria Police has attended and taken control of the scene. The investigator is also to liaise with a member of SFSL to establish whether a scientist is to respond or if the fire service investigator is required to determine cause and origin, document the scene and take samples.

CNR is to conduct its own investigations, assisted by other agencies upon request.

5. Where activities of a serial arsonist come to the attention of either the Fire Service Fire Investigation Section or the Victoria Police, immediate contact, in writing, is to be made with the team* to ensure that they are also aware of the connections made between the incidents.

6.1 If media require information relative to a fire, only the Fire Service will make statements to the media. However, no comment is to be made relative to cause unless in the public interest and only after consultation with the investigating officer.

6.2 If media require information relative to cause of a suspicious fire, only the Victoria Police are to make statements to the

media relative to that cause only.

6.3 If media require information relative to a fire under joint investigation by the team* the relevant agencies are to determine the appropriate representative/s to make statements to the media. Media enquiries are then to be directed to the relevant investigation representative/s.

7. When on-scene, prior to conducting any investigation or removing samples from a scene, any representative of an external organisation is to be directed to contact the team*.

NOTE : Team* can comprise of, but not limited to, members of SFSL; Fire Service; Fire Investigation Section; Victoria Police

NB : Whilst on-scene liaison must occur at all times with the Incident Controller

This has been produced for the information of Victorian Chapter members and other IAAI members, and to indicate the success of these procedures in Victoria with all the agencies involved in Fire Investigation.

NSW FIU REPORT

The NSW FRIU now has a new Superintendent in charge of the unit. Steve Smith took up the position in October 1997. Steve is a career firefighter having been in the Brigade for more than 20 years, and included in his many skills, along with fireground knowledge, he brings to the unit are management and computer skills.

A new policy has been adopted by the N.S.W. Fire Brigades in relation to the release of information on fires.

Verbal information may now be given to :

* members of the New South Wales and Commonwealth Police Services,

* officers of relevant government agencies, and

* the premises' owner/occupier, their insurance company, their agents or property agent, when these persons have established their identities.

The verbal information will be confined to:

- > time of call,
- > area of fire origin,
- > probable ignition factor,
- > whether there were indications of entry having been forced prior to the N.S.W.F.B. attendance or whether firefighters had forced entry, and,
- > Fire Brigades attendance.

There are limitations on the release of some of the information relating to suspicious fires and inquirers will be referred to the Police for further information.

Persons seeking additional information will be required to write to the Commissioner of the N.S.W. Fire Brigades, PO Box A249, Sydney South N.S.W. 1232, facsimile number (02) 9265 2886.

There are a few new faces in the unit these days due to the recent retirement of Bruce (BJ) Johnson and Jim Swaisland on long service leave.

The new officers will provide the same efficient, friendly and smiling service that has always prevailed !!!.

Roger Bucholtz

NEW SOUTH WALES NEWS

President's Report

I trust the Christmas and New Year celebrations were joyous and prosperous for all NSW AFI Members and their families.

Welcome to the first Firepoint magazine for 1998. I am confident the articles appearing in this issue will be of interest to all Members. Your Editor, Wal Stern has been very busy collecting new and interesting data for us to review and contemplate.

In the December 1997 issue of Firepoint I provided information concerning the proposed revisions to the NSW Commercial Agents and Private Inquiry Agents Act 1985. I have received correspondence from the Office of the Police Ministry advising that the new legislation will be introduced during the Autumn Session of Parliament.

The new legislation criteria for licensing "would follow the format adopted for the Security Industry Bill 1997. This Bill has since been passed by the Parliament but it has yet to be proclaimed." Matters relating to integrity will be closely scrutinised and will be controlled by the Police Commissioner.

Serious breaches of integrity by former Police Officers

within 10 years of applying for a licence will cause the application to fail. An appeal can be made if the "officer was removed under Section 181D provisions for other than integrity issues".

How the new legislation relates to the Insurance Industry, Banking and Finance sector, Loss Adjusting Fraternity or Special Agencies such as the Fire Investigation Unit is yet to be determined. I, like many others, await the new legislation with a great deal of interest.

The NSW AFI Executive has moved strongly to develop the July 1998 Seminar. The Conference will be held over two days at the Swiss Grand Hotel Bondi. Noted Local and International speakers will be in attendance.

More information is provided elsewhere in this issue, and will be released further to all Members throughout Australia and New Zealand, as it becomes available.

The NSW AFI strongly commends the up and coming March 1998 Conference in Nelson, New Zealand. The New Zealand Association of Fire Investigators have always been strong supporters of the NSW Chapter and it would be a great gesture of goodwill if Members throughout

Australia could show support and attend the conference.

The New Zealand Conference Agenda is varied and interesting in its approach and will no doubt provide food for thought.

Ross Blowers

Letters to the Editor

I am very familiar with the dryer fire problems noted in your magazine by Tony Cafe. My company provides a service to buildings to clean and service dryers and we see several hundred a month. Dozens have evidence of small fires that did not fully develop.

As you indicated, the leading cause is an accumulation of lint within the dryer housing itself. Lint is deposited on the switches, wiring and around the heater housing. This lint can be ignited by the heating element, the aging switches and through overheating of the wiring as a result of the insulating effect of the lint, increasing the heat and resistance. We often find burnt lint over wires, and upon removing the lint we discover the wire's insulation to be melted. It is easy to see how the cause could be (incorrectly) determined as being "faulty wiring".

Of course fires can also start within the drum as a result of drying flammable materials such as foam rubber found in pillows, shoulder pads, padded bras, as well as textiles that have been exposed to cooking oils, etc.

Robert Apens
Ontario, Canada

INTERNATIONAL ASSOCIATION OF ARSON INVESTIGATORS

MEMBERSHIP APPLICATION

TO THE SECRETARY, _____ CHAPTER _____
ADDRESS _____

STATE _____ POST CODE _____

(Refer to the list of State office bearers on page 3 for the appropriate address).

I hereby apply for membership of the _____ Chapter of the International Association of Arson Investigators Inc. in accordance with its constitution and By-laws and agree to be bound thereby. I attach the sum of A\$ _____ in payment of Annual Dues (\$ _____) and Initiation Fee (\$ _____).

All information recorded in this application is hereby warranted to be true and correct.

1. NAME IN FULL _____ 2. DATE OF BIRTH _____

3. EMPLOYER _____ 4. POSITION _____

5. BUSINESS ADDRESS _____

CITY/SUBURB _____ STATE _____ POST CODE _____

6. HOME ADDRESS _____

CITY/SUBURB _____ STATE _____ POST CODE _____

7. PHONE (BUS) () _____ FAX () _____

MOBILE () _____ HOME () _____

8. PLEASE LIST ANY FORMAL QUALIFICATIONS (DEGREES, DIPLOMAS, CERTIFICATES etc. WITH THE NAME OF THE ISSUING AUTHORITY AND THE YEAR OF QUALIFICATION.

9. MEMBERSHIP of OTHER ORGANISATIONS _____

10. HAVE YOU EVER BEEN CONVICTED of a CRIME? YES _____ NO _____

11. FULL CONVICTION DETAILS _____

12. ARE YOU A MEMBER OF THE INTERNATIONAL ASSOCIATION of the IAAI?

MEMBERSHIP No. _____

13. REFERENCES (Name, address, phone number, occupation)

A _____

B _____

14. RECOMMENDED by a MEMBER in GOOD STANDING

SIGNATURE _____ DATE _____

15. APPLICANT'S SIGNATURE _____ DATE _____

A CALCULATED ARSON

by John Lentini, BA

This is a slightly abridged version of a paper written by the author, a fellow of the American Academy of Forensic Sciences, a Past Chair of ASTM Committees, and a recipient of the ASTM Forensic Sciences Award, 1996. John has been touring the U.S., presenting a lecture on the case he describes.

Abstract

This is a report of an arson investigation and the subsequent trial which led to the conviction of the defendant in the case of the Commonwealth of Pennsylvania v. Han Tak Lee. The methodology used by the investigators is examined, as is the presentation of expert testimony in the trial of this matter.

This paper illustrates the need for trained scientists to become more involved in the collection and documentation of evidence prior to its arrival in the laboratory, and to testify in a manner which does not magnify the certainty or importance of inconclusive data.

Introduction

The purpose of this article is to acquaint readers with some of the methods still used by some fire investigators to obtain convictions. These methods pretend to be founded in science, but are in fact founded only in mythology and pseudo-science.

This fire investigation and subsequent trial demonstrate that a practiced expert witness with a straight face and a file full of "quantitative" data is capable of convincing an untrained jury and judge of just about anything. In this case, the Commonwealth's investigators calculated that a fire in a 1,000 square foot cinder block cabin had eight points of origin, and was ignited using 62 gallons of fuel oil plus 12.2 pounds of gasoline, despite the fact that the only ignitable liquid detected at the scene was collected from the furnace fuel filter and a container next to the fuel tank behind the cabin.

A review was conducted of all of the investigative reports plus all of the testimony of the expert witnesses and the Commonwealth's summation.

Background

Han Tak Lee was a native of Korea who immigrated with his wife and daughter to Queens, New York, where Mr. Lee operated a small business. Mr. Lee's daughter, Ji Yun, had difficulty adapting to her new life. She had an extensive history of mental illness, including several suicide attempts.

On Friday, July 28, 1989, young Ms. Lee got into an argument with her father about taking her medication. The argument got violent when the young lady grabbed a clock and threw it through a screen window. The police were called, and later, the pastor of the Lees' church was summoned. After talking with Mr. Lee and his wife, the pastor suggested that the young lady be taken to the Hebron Camp, a religious camp run by the Korean Assembly of God Church in Stroud Township, Pennsylvania. The Lees took their pastor's advice and Mr. Lee and his daughter travelled to the camp that day.

Ms. Lee was heard to state upon arrival that the camp was going to be her tomb. Later that night, she got into a screaming fit and had to be physically restrained by two

of the pastors at the camp. Still later that same night, the cabin where Mr. Lee and his daughter were staying burned. Mr. Lee escaped, and his daughter died in the fire.

The fire was reported to the Stroud Township Volunteer Fire Department at 3:18 a.m., and was reportedly extinguished very quickly. The total time of burning has been estimated at 28 minutes.

When the fire department arrived, the cabin was fully involved, with fire coming out the windows. Eventually, most of the roof was burned off and it was estimated that 90% of all combustible material was burned.

Mr. Lee was observed sitting on a bench across from the cabin, dressed in a short sleeved shirt, light brown slacks, and barefoot. The Stroud Township Police Department report states that Mr. Lee remained complacently seated throughout the fire.

At approximately 8:00 a.m., when it was learned that the victim's carboxyhemoglobin level was only 9.5%, the incident was declared to be a homicide/arson.

The Investigation

Trooper Thomas Jones of the Pennsylvania State Patrol, serving as an assistant state fire marshal, was the lead investigator on this case. He was assisted by

Patrolman/Investigator Vernon Bortz of the Stroud Township Police Department. Both officers prepared extensive reports describing the investigation.

A brief statement was taken from Mr. Han Tak Lee, and the fire scene examination began at approximately 5:20 a.m. At that time, the coroner removed the body from the scene for an autopsy and toxicology. Digging of the debris commenced at approximately 6:00 a.m.

According to Trooper Jones' report, clearing began in the hallway where the body was found. "Near the rear door of this hallway, a spill or flow pattern was observed. At this point, it was discovered the fuel filter on the furnace had been tampered with and unscrewed, spilling fuel upon the floor. The filter was checked, but it is the opinion of this officer that it was not damaged as a result of the fire but was tampered."

The next reported observations concerned a window on the back wall. "The window on the rear wall exhibited very fine crazing of the glass and was burnt clean." "Spill patterns and deep char patterns" were observed or detected on the floor in several places, and all of the burn patterns were, in Trooper Jones' estimation, "inconsistent with a normal fire."

On Page 3 of his August 8 report, Trooper Jones noted,

"Mr. Lee remained almost emotionless and while in view of this officer made no attempts to console his wife".

Trooper Jones' report makes no mention of the carboxyhemoglobin results, but Officer Bortz' report states, "At about 8:00 a.m. on said date, I was informed, via telephone, by Coroner Allen, that the carbon monoxide content in the victim's blood was a reading of 9.5".

According to Patrolman Bortz' report, when Mr. Lee was first interviewed, he stated that he was "woke up by the smell of smoke." Mr. Lee, who speaks no English, reportedly stated through an interpreter that he got up and saw fire in the victim's bedroom and the fire was going towards the bathroom. Mr. Lee stated that he attempted to rescue his daughter but was unsuccessful.

Debris samples were collected from six locations within the cabin. A liquid sample from the furnace fuel filter as well as a small can containing liquid found outside the cabin were submitted. Additionally, Mr. Lee's clothing was submitted along with a "control" sample of carpet.

These samples were submitted to the Pennsylvania State Police Regional Laboratory in Wyoming on July 31. On August 3, two additional debris samples and

a sample of a plastic jug and part of a glove from the bathroom floor were submitted to the same laboratory. According to the laboratory report, "No common accelerants were identified in any of the debris samples. Fuel oil was found in the liquid sample from the furnace filter and the liquid sample from the small can."

Mr. Lee's clothing reportedly contained "a volatile substance with a hydrocarbon range of C 7 to C 22. Of the evidence submitted on August 3, only the plastic jug and glove part contained anything of interest, also "a volatile substance with a hydrocarbon range of C 7 to C 22".

Later in the investigation, tissue samples from the victim were analysed for ignitable liquid residue, but the results were negative

On August 3, 1989, a criminal complaint warrant, #C-121-89, was issued charging Han Tak Lee with criminal homicide, arson, and related offences. Mr. Lee was extradited from New York to Pennsylvania on August 4.

Two months later, Trooper Jones contacted Daniel Aston, a Certified Fire Protection Specialist, who began his career as a fire fighter in 1960, and took his first course in fire investigation in 1969. Mr. Aston made observations concerning the construction, available fuel sources, the

size of the building, and the length of time in which the fire occurred. His final report, dated December 20, 1989, formed the basis of the State's case, which was presented in September of 1990.

Mr. Aston's report follows a peculiar format wherein he compares the behaviour of this fire to a time/temperature curve described in an ASTM test procedure E 119, "Methods of Fire Tests of Building Construction and Materials". While this standard time/temperature curve, developed in 1918, is meant only to describe the operation of a furnace in measuring the fire rating of resistive assemblies, Mr. Aston took the position that any deviation from this curve, particularly evidence of temperatures exceeding the time/temperature curve, would be evidence of an excessive fuel load.

The concept of using the curve for determining whether a fire was "normal" was not original to Mr. Aston. In "Physical and Technical Aspects of Fire and Arson Investigation", Carroll, on Page 72, uses this curve and states: "Using this flame spread index (available from Underwriters Laboratories, Inc.), a fire investigator can determine the comparative rate of how fast a fire should or should not have spread under normal circumstances by comparing the burning rates of known fires and the standard ASTM (American

Society of Testing and Materials) time/temperature fire exposure chart shown.

The Standard Time-Temperature Curve shows the temperature acquired as a function of time which has been found to be the average temperature eight feet off the floor. It is used as a basis in comparing the burning rates of structures."

Despite numerous experiments on real fires which show that this ASTM time/temperature curve has no relationship to reality, Carroll used it for that purpose, and his book was unfortunately a major text at the National Fire Academy for many years.

Test data from a series of NFPA tests and its relationship to the ASTM curve show the effects of changing the ventilation in a 1,000 square foot room, with a fuel-load slightly higher than that calculated by Mr. Aston. All of the curves on this chart exceed the ASTM curve in terms of temperature.

Mr. Aston calculated that the fire consumed 7,788.28 pounds of Class A combustible materials. He did this by "assigning" a weight to all of the furnishings and building materials in the cabin. Added to this were "carefully calculated" weights of the wooden members, using values published in "Safeguarding Structures Against Windstorm

Damage," which gives the weight of a 2 by 2 at .74 pounds per running foot, a 2 by 4 at 1.48 pounds per running foot, a 2 by 10 at 3.86 pounds per running foot, and roof decking at 1.7 pounds per square foot.

Once he had determined the precise weight of the fuel consumed, it was only necessary to multiply by 8,000 BTU per pound to determine the energy content of the fuel.

Two methods of analysis were used by Mr. Aston once he had gathered all of the "Physical Details". In one method, he noted that the American Forest Products Association reported a burn depth rate of 1.54 inches for every 40-45 minutes, and further noted that the heat source for the 2 by 10 ceiling joists was "from below."

Therefore, at a "normal" burn rate, the 2 by 10 joists would have required 4.8 hours to burn, since in Mr. Aston's estimation, there was not a significant amount of heat impinging on the sides of the joists.

In the second analysis, using the "physical data," he noted that the time required to obtain the melting point of copper per the standard time/temperature curve was 3 hours 45 minutes, yet in this fire, which lasted only 28 minutes, melted copper was observed. "Deviations of Burn" was another table which appeared in Mr.

Aston's report.

Based on these "deviations," Mr. Aston was able to calculate how many additional BTUs were needed to account for the fire burning in the way that it did, and then, using the known BTU content of flammable liquids, was able to demonstrate that not only were the 62 gallons of fuel reportedly missing from the full fuel tank required, but that an additional 12.2 pounds of gasoline was also required. (There was reportedly some gasoline "missing" from a shed about one-quarter mile away from the cabin.)

On Page 9 of his report, Mr. Aston reported the quantity of flammable liquid at 3.069 gallons per square foot in selected areas. (The report does not explain how deep this "puddle" would have been. According to the author's calculations, the liquid would have been at least 2.5 mm deep and up to 12 cm deep "in selected areas".

Later in the report, Mr. Aston presented yet another table, this one comparing a "normal" burn to the "actual" burn. This table concludes that the actual fire burned 81.6% more severely than "normal".

The Trial

Testimony of Trooper Thomas Jones

In his trial testimony, Trooper Jones stated that at approximately 8:00 a.m., he learned that the victim's carboxyhemoglobin level was 9.5%, and he concluded "this girl was probably dead when that fire started." (Later, it would be necessary for the medical examiner to admit that the victim had to have been alive).

Trooper Jones went on to state that he was "now at a crime scene." Despite having made this determination, six pages later in the transcript, Trooper Jones stated, "Well, as of right now, I am down to where I have two points of origin...I haven't determined yet that this fire is arson because I'm not finished, but now I know I probably don't have an accidental fire because I found two separate places of origin."

The nonuniformity of the burning in this cabin was used by Trooper Jones to indicate that material dropping down could not have caused any of the burning on the floor. Why falling debris should produce a uniform burn was not explained.

Crazing of glass was used by Trooper Jones to indicate that the glass was close to or very near a point of origin. Crazing of glass, of course, has been shown to be related

to the rapid cooling of glass and to yield no useful information about the progress of a fire.

Trooper Jones later talked about ruling out the accidental cause of smoking in bed because the "springs have lost their temper." This is another bit of conventional wisdom which has been thoroughly and effectively refuted by previously published work. The temper, or lack thereof, on furniture and bed springs is of no probative value in arson investigations.

Trooper Jones talked about low burning at doorways, as an indication of an intentionally set fire. He concludes, "Something was introduced or placed in that area to make it continue to burn that low or it would have burnt its normal course." This is typical fire investigator testimony, wherein the radiational effects of flashover are ignored, and the "heat rises" theory of fire spread by convection is all that the jury hears.

It is well known to fire investigators, and now described in detail in NFPA 921, that low burning at doorways is normal in compartments which become totally involved in a fire. Trooper Jones' misunderstanding of the phenomenon of flashover was demonstrated later in his testimony. When asked about whether the building had

flashed over, he said that it had not (despite reports that fire was spilling out of all of the windows and the roof was burned off). He stated, "You would probably see almost a straight line around that entire building where this flashover happened." The straight line to which Jones refers is a smoke line or a heat line, which actually precedes flashover and is generally destroyed soon after.

All of the combustible material in the main rooms of this cabin was consumed down to the level of the cinder blocks. Trooper Jones apparently was misled by a photograph in "Physical and Technical Aspects of Fire and Arson Investigation" which erroneously shows a heat line on a wooden wall and states that the room was ignited by flashover.

Trooper Jones further justified his conclusion that the fire was intentionally set by noting the lack of communication between the holes burned in the floor. The roof was completely burned off, and the walls were completely consumed, but this two-dimensional thinking regarding the condition of the floor is something that is typical of many fire investigators. Because there were areas of the floor less damaged than other areas, Trooper Jones attributed this to multiple points of origin.

Trooper Jones is of the opinion that floors should

never burn, as exemplified in his testimony on Page 250, where he states, "Normal fires, without accelerants, flammable liquids being used, at floor level should probably burn about 300 degrees." (Notwithstanding that the ignition temperature of wood is over 450°F.)

He states further, "Normally, a fire will not completely burn through a floor unless something is there to make it burn through that floor." Despite a diligent search of the literature, the author is unable to find any references to 300 degrees being the normal temperature of a floor level fire. NFPA 921, however, describes floor damage as a normal consequence of full room involvement.

Later, Trooper Jones was allowed to testify that "accelerant" was found in the jug, in the sample from the fuel filter, in the can underneath the furnace window, and that accelerant was found on the defendant's shirt and pants, despite the fact that the laboratory report is not at all clear on this subject. As will be discussed shortly, the chemist, Thomas Pacewicz, gave testimony on this subject which was not straightforward.

Testimony of Chemist Thomas Pacewicz

Chromatography was not presented to the jury, but Mr. Pacewicz did state that he

had used a packed column for his analysis. By the time this case was appealed, the chromatograms had become "unavailable".

While the report makes no mention of gasoline or Coleman Fuel, in the trial, the chemist testified, "Around C 7 to about C 9 or C 10 is a range normally found in gasoline and Coleman Fuel." He then stated, "When you start getting above that range, you're running into fuel oil components, and fuel oil runs all the way up to about C 22."

Mr. Pacewicz then used the wide range of carbon numbers to infer the presence of two different accelerants. Later, Mr. Pacewicz went as far as to say that there was a "substantial" quantity of gasoline found, despite the fact that there is no mention of gasoline in his report.

In an apparent attempt to show the jury that he could not have been misidentifying pyrolysis products, Mr. Pacewicz made the statement, "If there is no accelerant present, you get a straight line."

On cross examination, defence counsel apparently noted some differences in the chromatography, and asked Mr. Pacewicz about them. The State used the alleged similarities between the "range" of hydrocarbons found on Mr. Lee's clothing and the "range" of hydrocarbons found on the

sample of plastics from the bathroom to make a connection. Mr. Pacewicz answered somewhat disingenuously, "They both covered the same carbon number range." As any novice chemist knows, this says almost nothing about the similarity of the two chromatograms.

Later on in his cross examination, when asked why he did not report the gasoline, he states, in contrast to his previous "substantial quantity" testimony, "There wasn't a sufficient quantity of accelerant to confirm by our instrument." (Apparently, a sample can contain a substantial quantity of gasoline, but still not have sufficient gasoline for identification.) When asked whether mass spectrometry would have given him a greater indication of what the "other liquid" was, the chemist answered, "No."

The deferential cross examination of Mr. Pacewicz failed to include any questions about why such a persistent substance as fuel oil could not be detected in any of the debris samples, despite the contention that 62 gallons were used in the fire.

The unfortunate testimony of the chemist is a common occurrence in misdiagnosed cases of arson. Erroneous findings by the chemist will back up erroneous findings by the scene investigator. In this case, however, the findings reported in writing

differed significantly from the findings reported to the jury.

Testimony of Daniel Aston

Daniel Aston was the State's lead expert. He walked the jury through the same precise calculations which appeared in his report, but there was one calculation which he did not do, and this one affects his credibility as a witness.

He was asked to estimate the number of fires that he had been called upon to examine in his career and he stated, "Perhaps in my career I've probably experienced some 15,000 fires that I have been called upon to determine the cause for." This was from a part-time investigator who had a day job designing sprinkler systems.

In the 20 years between his first fire investigation course and the occurrence of this fire, Mr. Aston would have had to work 750 fires per year, or 15 fires per week, which allows approximately three hours each, assuming an outrageously busy full-time schedule. (A typical very busy fire investigator may work fifteen fires in a month, and possibly as many as 5,000 in a career).

When the number 15,000 first appeared in the transcript at Page 440, it was the author's belief that there must have been a typographical error, but the same number with the comma in the same place appears also on Page 443 and

Page 444. The Court was persuaded to allow Mr. Aston to testify. Defence counsel, rather than challenging this clear overstatement of qualifications, attempted to narrow down the number of times that Mr. Aston had investigated a 1,000 square foot cinder block building which had burned.

Mr. Aston testified that he found eight, and possibly nine, areas where he could determine that there were separate fires within this cabin. Given that the ceiling burned off of the main room and that there was communication among all of the fire damaged areas in this cabin, this type of determination cannot be supported by the evidence.

No attempt was made to account for the fact that the alleged arsonist, Mr. Lee, would have been incinerated, and in the unlikely event that he survived a fire which he allegedly set with more than 60 gallons of fuel, his clothes would have been reeking of fuel oil, not "hydrocarbons in the C 7 to C 22 range."

Despite the lack of positive debris samples, Mr. Aston attributed "extremely low burn patterns" to fuel oil on the floor, again following the theory that floors don't burn.

Mr. Aston tried to explain to the jury the significance of a piece of sheet steel being "deflected." He cited temperatures of 970-1,200°F

to cause the deflection of the steel on the baseboard heater, and attempted to find some meaning in that fact. Mr. Aston testified that a copper pipe being melted indicated exceptionally high temperatures.

Later, Mr. Aston referred to alligatoring, and stated, "A shiny alligatoring pattern generally indicates a very quick fire. A dull alligatoring pattern indicates a slow, very slow fire." This conventional wisdom has been shown to be without scientific foundation.

Aston later infers "extreme temperatures" from burned wood around a window, failing to take into account the effects of ventilation. He then goes on to describe how an inch to an inch and a half of lumber is consumed every 45 minutes, and then repeats his statement that a 2 by 10 joist would take 4½ hours to burn.

Unfortunately, no one in this trial thought to ask how he could rule out burning of the exposed wood from the sides. Even if the wood did burn at only 1½ inches in 45 minutes, it could easily have been consumed in the 28 minutes available. The standard time/temperature curve was then presented to the jury as the norm for fires.

Mr. Aston repeated Trooper Jones' misconceptions about crazing of glass. He told the jury that there were 62 gallons of home heating fuel and 12.2 pounds of gasoline

used in the fire scene and goes through an added calculation to convert pounds to gallons by multiplying the vapour density of gasoline by 8.33. Unfortunately, no calculations were presented to the jury to show them how deep the ignitable liquid would have been, or to explain the suspension of the law of gravity required to allow a five-inch deep puddle to exist on a flat surface.

The Defence

Mr. Lee's attorney, Robert M. Rosenblum, was overwhelmed by the evidence, and chose to believe that this was an arson fire. He called no expert witnesses, despite their availability. (The author did not get involved in this case until after the conviction, when, after reviewing the transcripts, he offered his services *pro bono*.)

Mr. Rosenblum's defence was that the fire was set as a successful suicide attempt by Mr. Lee's daughter. In Korean culture, a suicide in the family is a disgrace, and Mr. Lee refused to cooperate with this approach.

The Summation

David Christine, the District Attorney for Monroe County, summarised the evidence on behalf of the Commonwealth. Where the chemical analysis report states that the only identifiable "accelerant" came

from the fuel tank and fuel line, the disingenuous testimony of the chemist was used to bolster the Commonwealth's case.

"You know from common sense that this fire was started effectively. Whoever did this knew what they were doing. How do you know that? You know that because there was a mixture of accelerants.

You remember Thomas Pacewicz told you that accelerants found on the glove and the jug and found on Mr. Lee were a mixture. He said it was a fuel oil mixture and it was mixed with either gasoline or Coleman Fuel.

He told you, you couldn't tell which of those two other types of gasoline it was because the gas chromatograph dips and peaks overlapped, but he did tell you that it was a mixture of fuel oil and something. Another accelerant in the gasoline or Coleman Fuel range."

Actually, the evidence showed nothing of the sort. Mr. Christine argued that low burning meant accelerants. He went so far as to identify for the jury the order in which the various points of origin were ignited, thus attempting to explain how Mr. Lee avoided incinerating himself.

He referred several times to the mixture of accelerants.

He explained the positive reading for carbon monoxide in terms of young Miss Lee being choked or otherwise put at "death's door," thus explaining how she managed to breathe in a little bit of smoke. Finally, in arguing that the daughter could not have set the fire, Mr. Christine takes the position that, "If Mr. Lee did not start this fire, if, in fact, his daughter did, he would be dead because all the points of origin were started when they were poured to keep the place from blowing up. He would be a charred mess here in bandages, now, even a year after the fire and he came out with almost nothing."

Thus, like other individuals wrongly accused of arson, the fact that Mr. Lee survived is used against him. As in other cases, the mischaracterisation of a fire as arson resulted in a denial of the presumption of innocence and a wrongful prosecution.

Conclusion

The quality of the evidence presented by the Commonwealth speaks for itself. Fuel loads calculated to six significant figures, hydrocarbon "ranges" being interpreted as evidence of a mixture, furnace operating instructions being touted as normal fire behaviour, and a host of other "old wives tales" were used to

convict Han Tak Lee.

There are over 500,000 structure fires every year in the United States. (Approximately 15% are labelled suspicious or incendiary.) Each presents an opportunity for erroneous cause determination, and a significant number of erroneous determinations do occur.

Even if fire investigators are correct 95% of the time, that allows for 3,000 incorrect determinations of arson each year. These calculations demonstrate the need for objective investigations based on the scientific method.

Much has been written lately about the criminal justice system allowing guilty people to escape justice due to sloppy police work. Here is the case of the wrongful conviction of an innocent man, surely a worse result. The Lee case represents the ultimate triumph of junk science.

(Editor's Note: There has been considerable discussion on the Internet of this case, and its implications. It certainly leaves much room for thought, both in terms of the presentation of evidence, and by the inadequacies of the defence).