

FIREPOINT



IAAI JOURNAL



Firepoint

Victorian Chapter No. 58

President: Brian Neal

Phone: (03) 9754 4569

Fax: (03) 9762 2969

Mob 019 197 913

Secretary: Terry McCabe

Phone: (03) 9616 9594

Treasurer: Adrian Edwards

Phone: (03) 9865 2468

Postal Address: IAAI

Victorian Chapter No. 58

P.O. Box 7419

479 St. Kilda Road

Melbourne

Victoria 3004

Western Australian Chapter

President: Bill Mansas

Phone: (09) 223 3521

Fax: (09) 223 3548

Postal Address: c/- 2 Adelaide Terrace

Perth

Western Australia 6000

Association of Fire Investigators (Queensland). Chapter No. 59

President: Terry Casey

Phone: (07) 3832 7052

Fax: (07) 3832 7063

Secretary: Charles Foley

Phone: (07) 3864 6244

Fax: (07) 3822 4246

Editor: Terry Casey

Phone: (07) 3832 7052

Fax: (07) 3832 7063

Postal Address: Qld. Assocn. of Fire Investigators

P.O. Box 5173

Alexandria Hills Qld 4161

Association of Fire Investigators (N.S.W.) Chapter No. 47

President: Ross Blowers

Phone: (043) 883585

Fax: (043) 883585

Secretary: Robert King

Phone: (02) 9651 3499

Fax: (02) 9651 3104

Postal Address: NSW Assocn. of Fire Investigators

P.O. Box 148 Concord NSW 2137

Editor: Wal Stern

Phone: (02) 9514 1743

Fax: (02) 9514 1460

Postal Address: 93 Deepwater Road

Castle Cove NSW 2069

EDITORIAL

In this issue we conclude the three articles by Richard Kocsis on aspects of psychology in arson investigation. There are two articles by a French-Canadian electrical engineer, and two articles from the Internet.

If you have an article for consideration, we'd love to hear from you. Just send me a disc (Microsoft Word) or e-mail it to Wal.Stern@uts.edu.au

Best wishes to all our members for a happy holiday, and a bright New year ahead.

Wal Stern

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Stuart Ritchie BSc

P.O. Box 229, Lawson, NSW, 2783

Phone/Fax: (047) 59 2999

Mobile: 0417218081

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QUEENSLAND NEWS

MEMBERSHIP

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

- John Patrick Sharman - Barry & Nilsson Solicitors
- Alan Faulks - Dept. Mines & Energy
- Glynn Findlay - Suncorp Insurance & Finance
- Ken Horsley - Minter Ellison
- Stephen Grandidge - Robertson & Co.
- Paul Owens-Robertson & Co.
- Bill Arthur - Arthur Banks & Associates
- Ted Beitz - Qld. Fire & Rescue Authority - Fire Investigation Unit
- Kay Hughes - Corporate Home Unit Underwriting Agencies
- Charles Melloy - FAI Insurance
- John Fisher - FAI Insurance
- Det. Sgt Stephen Hollands - Qld. Police Service
- Det. Snr Constable Mark Hamilton - Qld. Police Service
- Det. Snr Constable Malcolm Gundry - Qld Police Service
- Gary Miles - LAC Loss Adjusters
- Michael Shield - LAC Loss Adjusters
- Graham Buntain - LAC Loss Adjusters
- Peter Mullins - Mullins Builders
- Neville Norman - Zurich Australian Insurance Ltd

SAFETY OF TELEVISION RECEIVERS

The Department of Mines & Energy has taken action in legislation within the terms of the current Uniform Approval Scheme to ensure that television receivers sold in Qld. comply to a published safety standard. This action has been necessary due to the

increase in the number of incidents of fire associated with television receivers.

This requirement will mean that from the 1st July 1997, all new models of television receivers sold must demonstrate compliance with AS/NZS 3250 - *Approval and Test Specification* - Mains operated electronic and related equipment for household and similar equipment including amendments 1 & 2. They will need to be issued with an approval certificate and be marked with an approval number or bear the Regulatory Compliance Mark (RCM).

Industry co-operation is also sought in ensuring compliance of existing models through certification and the use of the RCM after this date. Existing models will need compliance by 1st July 1999. This action is necessary to achieve an effective solution in terms of providing public protection and justified market-place intervention.

A television receiver is defined as an electrical appliance which

- is for household use;
- is for the display of public or subscription television broadcasts; and
- incorporates a single cathode ray picture tube.

Regulatory Approval means that television receivers must not be sold after the application date unless they -

- comply with the Safety Standard AS/NZS 3250 - 1995;
- are the subject of a Certificate of Approval issued by the Electrical Safety Office or another electrical regulator; and
- are marked with the designated approval or compliance mark.

Information supplied by Alan Faulks - Department of Mines & Energy.

ALARMED HOME OWNERS

As of the 1st July 1997, the new edition of the Building Code of Australia (BCA 96), will be amended to make it mandatory for smoke alarms to be installed in new homes or houses, which have undergone substantial alterations or additions.

Prospective home builders will be required to include 240 volt hard-wired smoke alarms in their building plans in order to gain building approval. About 45% of Queensland's residences are now equipped with smoke alarms - even so, this leaves more than half the States' residents unprotected.

During April and May, seven Queenslanders died in residential fires. None of the dwellings were equipped with correctly installed smoke alarms. There have been no recorded fire fatalities in Qld. homes possessing correctly installed smoke alarms.

1995 - less than 25% of Qld. homes had smoke alarms - 27 people died in fires, the majority (20) in private homes which lacked correctly installed smoke alarms.

1996 - 11 fire related deaths, including seven in houses without correctly installed alarms.

1997 - 45% Qld. residences equipped with smoke alarms.

"One operational smoke alarm can increase your chances to surviving a house fire by 100%. The alarm reacts within seconds and buys you time to get out."

QUEENSLAND NEWS

Location of smoke alarms

When deciding on the position of smoke alarms, it is important to remember that they are intended to detect smoke before it reaches the sleeping occupants of a building.

The ensuing alarm is designed to wake the occupants and give them time to evacuate the building.

There are two types of smoke alarms -

Photoelectric - This type of smoke alarm uses a light source and photocell. As the smoke enters the detection chamber it interferes with the light beam which in turn causes the alarm to sound. These type of alarms pick up smouldering fires slightly faster than Ionisation alarms.

Ionisation - A small amount of radioactive material is used to create an electrical current which travels through ionised air. When smoke enters the detection chamber it impedes the flow of current and causes the alarm to sound.

Nuisance Alarms - Smoke alarms are extremely sensitive and may detect smoke and moisture created by common household activities (such as burnt toast or steam from a bathroom),

Accordingly, to reduce the likelihood of false alarms, the smoke alarm should not be located near coding appliances and bathrooms.

People seeking information on fire alarms and other fire safety measures should contact their local fire station.

Information supplied by Fire Safety Officer Graeme Thom - Qld Fire & Rescue Authority.

SMOKE ALARM LEGISLATION

As mentioned in the above article, new smoke alarm legislation came into force on July 1 making it mandatory for all new homes and largely renovated homes to have properly installed alarms.

The legislation, which is included in the amended Building code of Australia, brings Queensland into line with all other States and Territories, except the Northern Territory.

Emergency Services Minister, Mick Veivers said he was now keen to extend legal requirements from new homes to all homes.

The Minister said the question of how to police the installation of alarms into existing buildings, and what actions could be taken if alarms were not installed, were difficult to answer and would need to be investigated before legislation could be considered.

Information from Fire Life - official journal of the Qld. Fire & Rescue Authority.

COMMITTEE MEMBER HONOURED

Alan Faulks (Dept. Mines & Energy), a committee member of the QAFI has been honoured recently with the presentation of an Australian Fire Service Medal. Those honoured with Alan (who is an Auxiliary Lieutenant) were former Rural Fire Chief Bob Barchard, Far North Region commissioner Brendan Doyle, Gordonvale Volunteer Frank Steene and Warwick based fire officer Paul Tattersall. The medals were presented at Government House in September.

A GOOD YARN

A Charlotte North Carolina man, having purchased a case of rare, very expensive cigars, insured them against - get this - fire !!!

Within a month, having smoked his entire stockpile of fabulous cigars and having yet to make a single premium payment on the policy, the man filed a claim against the Insurance Company.

The Insurance company refused to pay, citing the obvious reason, that the man had consumed the cigars in normal fashion. The man sued and won !! In delivering his ruling, the Judge stated that since the man held a policy from the company in which it had warranted that the cigars were insurable, and also guaranteed that it would insure the cigars against fire, without defining what it considered to be "unacceptable fire", it was obligated to compensate the Insured for his loss.

Rather than endure a lengthy and costly appeal process, the Insurance company accepted the judges ruling and paid the man \$15,000 for the rare cigars he lost in "the fires".

After the man cashed his cheque, however, the insurance company had him arrested on 24 counts of arson.

With his own insurance claim and testimony from the previous case being used in evidence against him, the man was convicted of intentionally burning the rare cigars and sentenced to 24 consecutive one-year terms.

VICTORIAN NEWS

MEMBERSHIP

The Chapter committee welcomes a new member to the Victorian Chapter, Rod East.

Membership and costs of the Chapter are currently being reviewed. The committee advises that those members who have not paid fees will be sent an account in the near future. Prompt payment is requested as the Chapter needs your funds to run.

There have been some movement of members with Ex-President Garry Martin moving from MFB Fire Investigation and Analysis Department to the MFB Training and Education Department, and Ex-President Adrian Edwards has changed from the Arson Squad Victoria Police to INS Investigations. All the best to both these members in their new ventures.

PROGRAM 1997

It is with much regret that the proposed Supper meeting to be held in October has been postponed, but it will be held as soon as possible. With the resignation of our administration officer Phil Harris, the strain is showing on those on the committee already doing too much. The Golf Day has been postponed till February, so don't throw your clubs in the cupboard yet; keep practising. Members will be notified as soon as arrangements have been finalised for both events.

COMMITTEE VACANCY

The committee still has a vacancy for a committee member. Any one interested should contact or write to the Secretary.

NEW ADDRESS

For those who did not notice our change of address in the last issue, it is:

IAAI - Victorian Chapter
P.O. Box 7419
479 St. Kilda Road
MELBOURNE VIC 3004

MEMBERS MERRY XMAS TO ALL OUR

NEW SOUTH WALES NEWS

NSW PRESIDENT'S REPORT

Welcome to the fourth and final edition of Firepoint for 1997. Over the past twelve months we have witnessed substantial development and maturity in the quality and content of the articles appearing in the "Firepoint" Magazine.

This positive direction has been essentially the work of our Editor - Wal Stern. I wish to extend sincere gratitude for his tireless effort and commitment to the task. The professionalism of "Firepoint" and its efforts to assist in the education process of the Membership is a mark of achievement.

Some extraordinary developments for the Investigation Industry as a whole in NSW have arisen. As President of the NSW AFI I was invited to be a Member of a Working Party for the Office of Police Ministry to review the current Commercial Agents and Private Inquiry Agents Act.

This piece of legislation governs the Investigation Profession in NSW. For some

time it has been in dire need of revision and upgrade. The NSW State Government has seen fit to commence the process now.

The *NEW* legislation will encompass a much broader spectrum of operatives in the Investigation Industry. Initial arguments were to have all claims personnel in the Insurance Industry Licensed because "they ask questions". The NSW AFI argued strongly against this aspect as it was seen to interfere with the normal course of business for the Insurance Industry.

As the "Working Party" continued to meet, there was a "drip feed" of information from the Policy Analyst which caused me some concern. As a result, the assistance of your Senior Vice President - Mitch Parish was brought into the fray to lend some much needed support and another strong voice.

The nomenclature of Investigator will now encompass any person or entity that engages in detailed searching inquiries. Those who will be required to be licensed as Private Investigators include: Forensic

Fire Experts, Motor Vehicle Accident Examiners, Factual Investigators, Loss Adjusters and Special Claims Units within Insurance Companies.

Licence fees will be increased substantially, Licence Holders must be a Member of an Accredited Organisation (defined under the Act), possess a qualifying certificate from an accredited education institution and continue an Education and Training programme whilst holding a licence.

An Industry Committee is proposed to monitor Ethical and Professional Behaviour and breaches of Codes of Conduct as prescribed by Accredited Organisations. The Industry Committee will make recommendations to the Commissioner of Police on licence disqualification, fines, suspensions and compulsory training.

It is proposed the *NEW* legislation will be tabled in Parliament and passed prior to the Spring Rising. The Act will not be promulgated until the first sitting period in 1998.

I strongly recommend that all interested persons review this *NEW* piece of legislation and make your thoughts known to your local Parliamentarian on the pro's and con's of the legislation.

To change the tone, I am sad to announce that this year, the NSW AFI will not be holding the annual Christmas function. It is sad to break tradition however, your Executive have taken into consideration the falling numbers at the Annual Christmas functions. The costs involved in the Christmas functions have largely been subsidised by the Association. This subsidy seems to only benefit the few people who attend the function.

Therefore, the Executive have decided to cancel this year's function and use the funds, which would normally be directed towards this event, to developing the two day seminar to be held in July 1998 at the Swiss Grand Hotel, Bondi.

A Conference Sub-Committee headed by Mitch Parish is now meeting to develop the theme and content. A great deal of thought and effort go into hosting the NSW AFI Conferences and I am confident the 1998 event will be of an extremely high standard. Should any members have ideas on content or agenda please

contact Mitch Parish or your Editor - Wal Stern.

I would like to extend a sincere vote of thanks to the Executive of the NSW AFI. Their support, friendship and guidance over the past 12 months has been an inspiration. I look forward to working with them and for them in 1998.

To all Members of the NSW AFI and State Chapters throughout Australia, I wish you and your families a happy, peaceful and joyous Christmas. May 1998 bring you peace, happiness and luck in all your endeavours.

A memorandum to all Chapter Members will be dispatched early in 1998 identifying Seminar content and dates leading up to the July 1998 Conference.

Merry Christmas and Happy New Year to all

Ross Blowers

("Small Fires Can Be Difficult To Investigate")
(concluding the article on page 10)

They hide some of the facts to protect a child experimenting with fire or because the witness wanted to hide his carelessness. This list could be extended without limits.

Conclusion

This small and simple fire teaches us a lesson. Such a small fire, under other circumstances could have been difficult to investigate. In fact, one would have been left with numerous reasonable hypotheses, with no way to eliminate all of them but one,

In fact, in such a fire, if there were three fire investigators, probably all of them will find a different cause by the process of elimination. The common problem is that with three fire investigators, one often has three different causes. Of course, that did not happen in this case. However, this author has many examples of such small fires that could present a real challenge because of some missing facts.

(This is one of two articles in this issue by Dr. Bernard Beland. The other is on pages 11-13)

SMALL FIRES CAN BE DIFFICULT TO INVESTIGATE

Introduction

Once in a while, one has the opportunity to examine the damages from a small fire. These fires may not challenge the fire investigator, however, they provide an opportunity to learn. Often, one learns more from these small fires than from the large ones. In the large fire, it is often left with numerous possibilities with no evidence to reject most of them. The investigator is then left with many possible causes.

Recently, this author was a witness to a small fire that did almost no damage. The fire by itself is of no interest, however, the lesson learned from it is enlightening, and shows the difficulty that a small fire sometimes presents.

The Fire

One evening, three of us were sitting around when we all smelled intermittent smoke, like that of burning hay or dried grass. The house was thoroughly inspected both inside and outside. Additional inspections were repeated over the course of an hour. The source of smoke could not be located, since it was intermittent, and there was a slight breeze. We also noted

that we never smelled the smoke when we were some distance from the house.

Eventually, some smoke was seen emerging from the ground beside a wooden balcony. Clearly, a lit cigarette had been disposed of on the ground that had recently been covered by about two inches of peat moss. Smoldering combustion took place in the peat moss and had burned an area of about one foot in diameter.

Discussion

That fire was easy to investigate and had quite an obvious cause. Let us assume that the fire had extended to the wooden deck and the plastic cladding of the house. Then the cause could have been difficult to establish. Some of the obvious causes would have been arson, a discarded cigarette or a child playing around with matches. To further complicate the analysis, an extension cord with a hedge trimmer was plugged into an outlet right above the point of origin.

Assuming that a flaming fire had lasted for five minutes or more, another reasonable hypothesis would have been a failed wall outlet or a fault

in the extension cord since arcing would have been likely to happen.

The cigarette cause would have been far from evident if the fire had lasted for a longer time with flames and falling debris. The owner of the house quit smoking many years ago and was known as a nonsmoker.

However, he admitted to me that, in fact, he sometimes still buys a pack of cigarettes. He did smoke before the smoldering combustion and had disposed of his cigarette at that exact place where the smoldering fire was discovered. He disposed of his cigarette quickly and carelessly when someone arrived because he wanted to hide the fact that he did smoke occasionally.

A fire investigator that would have questioned most people close to that friend would probably have found that no one smoked in the house. It is quite common to receive "facts" that do not correspond to the reality.

The above case is a typical example. This author knows of numerous cases in which nice people did not tell the truth.

(This article continues on page 9)

REFLECTIONS ON THE CAUSE AND ORIGIN.

(An article from the September 1997 edition of fire and Arson Investigator, from Dr. Bernard Beland.)

In the fire investigation process, it is generally agreed that one first determines the point of origin and then, the cause.

While the rule generally applies, it suffers numerous exceptions as will be seen by examples to be discussed. The most important result is that of finding the cause. Finding the area of origin is just one of the steps that helps establishing the cause. Sometimes, the point of origin could be found with some accuracy but still the cause is unknown because there are too many possibilities to consider with no means to eliminate all of them but one.

In other instances, the cause of a fire could be known with a high degree of certainty, even though the point of origin is not known. Examples will be given of such cases.

CAUSE-ORIGIN

The semantic problem of using "cause and origin" or "origin and cause" should not bother us in this article. The point of origin or at least the area of origin is often found with a reasonable degree of accuracy, assuming the damages are not too extensive. Alternatively, there are numerous instances for which the point of origin is not clear, even in the case of a

limited fire that extends only to one room.

If one can determine both the point of origin and the cause from independent facts and reasoning, then one has a very high probability of being right. For example, if the probability of being right is 90 percent in each determination, then the cause is known with a 99 percent certainty.

However, this is very seldom the case, since the two processes are often interrelated. In fact, in numerous cases, one finds the area of origin. In that area, a beaded wire is found. Then an electrical arc is pointed as the cause of the fire. This process is wrong since an arc is a normal consequence of almost all fires.

The two events are dependent. For example, a fire could be set with a match and paper in the vicinity of an electrical cord and a bead is most likely to be produced. In such a case, the evidence of the arc is almost useless by itself. It is just like the presence of charred wood. It is evidence of the fire and not of the cause. However, if through an independent process, it could be shown that the cord was severely overloaded to the point of constituting a danger of fire in the presence of proper combustibles, then the possibility of an electrical fire becomes acceptable.

An overload just above the ampacity of the National Electrical Code (NEC) would not be sufficient evidence. For example, 20A in a No. 14 AWG

copper cable would not be sufficient evidence. The load would have to be of the order of 50A and sustained over a long time. The exact conditions would have to be evaluated for each circumstance such as ambient temperature, thermal insulation and other factors.

All too often, the fire investigator determines the general area of origin, then finds evidence of beading and concludes as to the cause. The report then mentions that the exact point of origin was determined and, at that point, only electricity could have caused the fire.

Often the point of origin was not clearly determined, and the report is silent on the exact nature of the electrical fault and on the reason for the fault to have happened so as to cause the fire. The electrical cause was used as an example, but other causes could have been used to illustrate the point.

FIELD CASES

A few field cases will now be discussed briefly to illustrate the introductory remarks. They correspond to actual cases that have been investigated, although there could be some modifications to better illustrate the discussion. Most of them would have been encountered by fire investigators, although the details could vary.

CASE 1 (FLOATING NEUTRAL)

A truck ran into a triplex cable that fed a summer house and severed the neutral. The house had no public water system and, therefore, the ground was provided only by electrode rods driven into the soil. Severing the neutral removes the house from the power company ground. The open neutral constitutes a serious danger of fire, that is enhanced by the poor ground.

A fire ensued about half an hour later and completely destroyed the house. Under that open neutral condition, some of the loads in the house are fed by a higher than normal voltage while others are underfed. The actual values depends on many circumstances; typical values could be 150 and 90V or some other combination which sum equals 240V.

In such a case, the cause of the fire is known with a reasonable degree of certainty. It is the floating neutral. This is the most probable cause by a large margin. Other causes could be considered as a remote possibility, but should be rejected unless other strong evidences are found. This is a good example of a fire in which the point of origin is unknown but the likely cause is very clear.

Other engineers working for the truck insurance company dug the debris, found evidence of beaded wires and claimed that the fire was caused by electrical malfunction that had nothing to do with the severance of the neutral. This is not exceptional and is often encountered in practice.

There is a tendency to write a report that pleases the organization that retained the service. A fire is a very uncommon phenomenon. In a given house, it does not happen for years.

If a fire happens almost simultaneously with the creation of a dangerous situation, then, there is probably a relationship between the process and the fire. That relationship can sometimes be removed but very strong evidences must be presented to remove it.

CASE 2 (THAWING OF WATER PIPES)

On a very cold afternoon (-35°F), an oil-fired furnace broke down. An electrician was called to install temporary electrical heating to prevent the water from freezing and protect the facility. The installation was completed around 10 p.m. and a fire was discovered some three hours later. The fire completely destroyed the building. This author was called to investigate the fire and, if possible, find evidence to recover the losses from the electrician.

The investigation revealed that the electrical work was well done. He had used the proper size of conductors and the work was professional, at least for a temporary work that was to be removed the next day after a new furnace installation.

The code was not adhered to in all details. For example, cables to the heaters were run on the concrete floor without mechanical protection. Although the code was not

adhered too, that specific violation constitutes no danger of fire and, it will be hard to blame the electrician.

An investigation did not reveal the area of origin. There were numerous low burns everywhere. There was also numerous evidence of arcing in the temporary wiring and elsewhere. This is not unusual.

The close time proximity between the electrical work and the fire suggests a relationship between the two events. But there was nothing wrong with the installation. Further investigation revealed the presence of an oxyacetylene torch with its tanks. That facility was used to prepare and store food. Acetylene is not used to prepare food and, therefore, its presence was intriguing and called for an explanation.

The owner was questioned. He also owned a garage. That is a good reason to own that welding equipment. The next question was "Why did you have that equipment at the food plant?" With great embarrassment, he explained that, to prevent the freezing of the water pipes, while the temporary heating was being installed, he used the torch to heat the pipes. The pipes were installed close to the walls that were finished with loose-fiber insulating board.

That material may be ignited by a match in a matter of a few seconds. If one blows out the flames, the material will sustain smoldering combustion inside. The inside is red hot while the outside surface is black and charred. That smoldering process proceeds at a speed of inches per hour and could

eventually lead to a flaming fire.

The owner was told that the thawing process is dangerous under the circumstances. He agreed and replied that, in fact, he started fires on the wall a few times. But he was with his son. His son had a bucket of water and quenched the flaming combustion a few times. Tests showed that, under that condition, although the flames are extinguished, smoldering combustion could continue inside.

Very clearly this fire was most probably caused by torch-thawing of water pipes. The cause is known with a very reasonable degree of certainty while the point of origin is unknown.

REMARKS

These two examples show clearly that, sometimes, the cause could be known with a reasonable degree of certainty, even if the point of origin is unknown. Numerous other examples could have been used.

The second example requires further comments. The owner of the building who conducted the thawing process already knew or, at least, strongly suspected the cause of the fire. In fact, he tried to hide the fact.

When he was asked if he had done anything dangerous that

could have caused the fire, he said no. However, when he became aware that the torch had been found, he was clearly ill at ease. Obviously, the fire was not intentional. The fire resulted from a dangerous process that was not conducted properly.

Numerous other examples of such fires could be discussed in which there is already someone who suspects the cause because of some processes that were performed.

The perpetrator of the process will do everything he can to avoid being pointed as responsible. It is human nature to be reluctant to admit one's fault. The culprit is often determined by carefully investigating the fire scene, looking for something unusual or out of place that calls for some explanation.

Often, the fire investigator does not even know specifically what he is looking for. By being inquisitive, one sometimes may solve a complex problem. In fact, the solution often looks very simple, once found.

Complex explanations for fire cause are often faulty. This author knows of many fire cases in which there was already someone that knew or at least suspected the cause of the fire. The above case is just one example.

The first case stresses the relation that often exists

between a fire and a dangerous act or process that happens in close time proximity with the fire.

The second example stresses the same point, but adds a word of caution. That relationship may not be unique. When something happens such as the failure of the furnace, not only the electrician's work could have caused the fire but other acts or processes could also have taken place.

CONCLUSION

It has often been stressed that one must determine the point of origin of a fire before the cause could be established. While that sequence is desirable, it suffers many exceptions. Field cases were used to illustrate that it is sometimes reasonable to establish a cause with a reasonable degree of certainty, even if the point of origin is unknown.

(About the Author: Bernard Beland has studied fires under laboratory conditions and in the field. He has taught at numerous Canadian universities and recently retired from the Université de Sherbrooke as a Professor in the Department of Electrical Engineering. He is a frequent contributor to the IAAI Journal.)

Psychological Crime Scene Analysis in Arson Investigations

By Richard Kocsis B.Psych(Hons), M.Crim.

Abstract

The 'Organised/Disorganised' behaviour dichotomy is the principal maxim underlying the 'Crime Scene Analysis' approach to criminal profiling. It represents a method of analysing crimes by their level of sophistication. Despite minimal published empirical support of its validity, the American Federal Bureau of Investigation has continued to expound this maxim. A sample of Australian profit and vandalism motivated arsonists was tested for empirical support of the organised/disorganised dichotomy. The results support the existence of distinct behaviour patterns and offender characteristics between profit and vandalism motivated arsonists that match those predicted by the organised/disorganised behaviour dichotomy. However, the results also indicate that the holistic analysis of criminal behaviour by this dichotomy is unrealistic and highly subjective in its interpretation for the construction of criminal profiles.

Author's Note

Article length allows only an abridged summary of the undertaken research. A full research report of this material is available through the NSW Police State Intelligence Group, NSW Police central library, or by contacting the author, c/- Department of Psychology, University of New England.

Introduction

Possibly the most widely established approach to criminal profiling is the technique of 'Crime Scene Analysis' as first espoused by the American Federal Bureau of Investigation (Kocsis, 1997). A basic premise of crime scene analysis is to assess a crime by its level of sophistication. This assessment is accomplished by identifying various features of the crime referred to as 'crime scene indicators'. From the presence or absence of these indicators the crime is judged to be either 'organised' (a crime representative of a high level of sophistication) or 'disorganised' (a crime representative of a low level of sophistication). From previous FBI research typical offender characteristics have been matched with the organised or disorganised behaviour patterns (Ressler, Burgess, & Douglas, 1988). The compilation of these various offender characteristics from their corresponding crime scene indicators represents a criminal profile.

The principal mechanism underlying the crime scene analysis approach to profiling is this 'organised/disorganised' behaviour dichotomy. Although this behaviour dichotomy is theoretically plausible, it has received little published research empirically supporting its validity. Even from its inventors, the FBI Behavioural Science Unit, the only published research demonstrating its validity has been the original study where it was first advocated (Ressler *et al.*, 1988). Despite this paucity in validation, the FBI has further developed the organised/disorganised maxim by its incorporation into a lexicon of typical criminal motivations known as the *Crime Classification Manual* (Douglas, Burgess, Burgess & Ressler,

1993). In this text the FBI categorise various motives and behaviour patterns inherent to crimes of homicide, rape and arson. Underlying each of these categories is the level of sophistication characterising it towards either an organised or disorganised style of offence.

This study sought to empirically test the validity of the organised/disorganised behaviour dichotomy in a sample of Australian profit and vandalism motivated arsonists. The *Crime Classification Manual* (Douglas, Burgess, Burgess & Ressler, 1993) predicts that profit motivated arsonists typify the behaviour patterns of an organised offender. Conversely, the vandalism motivated arsonist typifies the behaviour patterns of a disorganised offender. Should corresponding behaviour patterns be observed in the Australian samples to the predictions of the CCM, these results will lend support to the validity of the organised/disorganised behaviour dichotomy.

Method & Results

A sample of 42 profit motivated and 16 vandalism motivated arson cases were studied from the case files of the NSW Police Service. All cases were closed, and included details on the convicted offender. Each case was coded for 26 crime scene variables and 30 offender variables. All data were then analysed with a combination of both descriptive and inferential statistical techniques.

Descriptive statistics produced templates of typical crime scene behaviours and offender characteristics for profit and vandalism motivated arsonists. These templates matched the predictions of the *Crime Classification Manual* (Douglas, Burgess, Burgess, & Ressler, 1993). Inferential statistical analysis of these templates indicated that profit and vandalism motivated arson were significantly different. Finally, although the generated templates were found to be significantly different, trends of co-occurring behaviours were observable between the differing

categories. Table 1 and table 2 summarise some of the behavioural and offender characteristic for the sampled Profit and Vandalism motivated arsonists.

Table 1. Profit Motivated Arsonist - Organised Offender

Crime Scene Indicators

Primarily target commercial facilities
then residential structures
Set multiple points of origin
Frequently use accelerants
Will use delayed action devices to initiate fire
Severe fire damage to target
Seldom force entry
Seldom leave physical evidence
Displace personal effects

Offender Characteristics

Adult offender
Predominantly self employed
Married or in defacto relationship
Usually posses a motor vehicle
Generally do not have prior criminal record
May commit solo attack or with accomplice
Reside within privately owned home

Table 2. Vandalism Motivated Arsonist - Disorganised Offender

Crime Scene Indicators

Primarily target educational facilities
Predominantly set single point of origin
Do not commonly use accelerants
Damage to targets tend to be less severe
Force entry
Frequently leave physical evidence
Do not displace personal effects

Offender Characteristics

Juvenile offender
Predominantly unemployed or students
Commonly without any partner
Do not posses a motor vehicle
Frequently have record of prior criminal offences
Commonly commit attack with accomplice(s)
Live with family - no propriety interest in home

Discussion

The results demonstrate distinct patterns between profit and vandalism motivated arsonists. These patterns follow the predictions of the *Crime Classification Manual* (Douglas, Burgess, Burgess, & Ressler, 1993) and therefore concurrently support the proposed organised/disorganised behaviour dichotomy.

Following the principals of an 'organised' offender the profit motivated arsonist demonstrates elements of premeditation and a high level of sophistication in the commission of an offence. Attributes of premeditation are observable in the data by the use of accelerants or the setting of multiple ignition points to ensure the destruction of the target. Other attributes of premeditation and sophistication are the precautions offenders undertake to avoid detection. These include the absence of physical evidence or the use of delayed ignition devices. These behavioural patterns of sophistication and premeditation are representative of an older, wiser offender. This notion is borne out by the results. Sampled profit motivated offenders were adults, predominantly family men with their own homes and businesses.

In contrast, the 'disorganised' offender (vandal) demonstrates a spontaneity and low level of sophistication. The initiation of a fire in these cases is an incidental or opportunistic behaviour. The data support these predictions of spontaneity in vandals by their lack of additional behaviours to ensure the fires destruction of the target. A single point of ignition and the absence of accelerants are less effective in destroying a target and indicate that the fire was not planned. Similarly, the frequent presence of physical evidence and the small amount damage¹ to the target also indicate that the arson was not planned. These behavioural patterns are characteristic of a younger, less experienced

offender. The FBI profile of the vandal arsonists was supported by the results. Sampled vandals were all juveniles who were either studying or unemployed. They seldom had a partner and lived under the care of parents or guardians.

Whilst these results do lend support to the organised/disorganised behaviour dichotomy, they also point to an inherent theoretical weakness. Although statistically significant differences were found between vandals and profit motivated arsonists, overlaps in behaviours were also observed. That is, vandals (disorganised offenders) sometimes display some behaviours typical of a profit motivated arsonist (organised offender) or vice-versa. This flaw in co-occurrence in behaviours is highlighted when it is recognised that vandals and profit arsonists are postulated to epitomise extreme opposites and yet still demonstrate overlap. This flaw would be worsened if additional motives, where these behavioural distinctions are less obvious (e.g., revenge or crime concealment), were added to this analysis. In such a circumstance, the probability of finding clear differences between categories to support a dichotomy is unlikely.

Clearly criminal behaviour cannot be explained by a simple categorical dichotomy. Consequently, the practical application of the 'organised/disorganised' dichotomy to criminal profiling must be a highly subjective process. Subjective interpretation is not commonly part of the scientific method. Although the precept of analysing crimes by their level of sophistication is plausible, criminal behaviour is more representative of a dimensional continuum. Consequently, the measures employed to make such an analysis of criminal behaviour must take this dimensional approach into account. Research using this principle has already been undertaken in the crime of rape, but has yet to be explored in arson (Canter & Heritage, 1990).

¹ This being in circumstance where the fire does not take hold of the structure through available combustible materials.

In conclusion, the present study demonstrates the organised/disorganised behaviour dichotomy that accords with opposing levels of behavioural sophistication. From this analysis templates of typical crime scene behaviours and offender characteristics were produced for profit and vandalism motivated arsonists. However, the results also indicate that such a dichotomy cannot objectively account for the full capriciousness of criminal motivations and behaviours.

About the Author

Richard Kocsis is a Criminal Psychologist and the project co-ordinator of the Criminal Profiling Research Unit, a joint research program between the University of New England and the NSW Police Service. Mr. Kocsis is currently completing a doctorate in Criminal Psychology at the University of New England. This is the third article in a series presented in "Firepoint" magazine in 1997.

Aspects covered in these articles were presented to two meetings of the NSW AFI during the year.

Acknowledgement

Special thanks to Professor Harvey Irwin, Department of Psychology, University of New England for kind assistance in drafting this article.

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GRANT TO ATTEND IAAI ANNUAL GENERAL MEETING.

The International Association Education Foundation has agreed to pay a grant of \$US 1000 to help offset the cost of attending the 1998 Annual General Meeting and Seminar, to be held in Portland, Oregon in May, 1998, to two applicants for off continent "Train the Trainer" programs. Australian Chapters meet the requirements to apply for these awards.

If you would like to be considered for one of these awards, which may be used to offset costs for registration, airfares, or other seminar related expenses, submit a letter to your local state Chapter, stating how the information learned at

the seminar will be utilised, and what training for Chapter members you would provide on your return from Oregon.

A separate completed application form, for forwarding to the IAAI Educational Foundation, should be included.

Should you have any queries regarding these grants contact, in North America, Judy Maydew at 403 466 6544 or David Sneed at 817 329 5252 or Alan Clark at 515 236 6121 (Extension 4265), or contact your local Australian Chapter President.

WHO SHOULD HOLD ON TO THE EVIDENCE?

Robert Toth invoked a spirited discussion on the Internet with the following piece on who should retain evidence found at a fire scene, in non-criminal matters. Do you have a view on the local situation around Australia? If you have, we'd like to hear from you.

I was in a discussion with a group of fire investigators and the following topic came up. I thought it might provoke some discussion.

A public fire investigator is at a fire scene, and through the investigation determines that the fire is not intentional and in fact determines the ignition source is a consumer product, ie. coffee maker, television, electric lamp, whatever.

Since this is not criminal; does or should, the public investigator gather the "evidence" or believed ignition source of the fire and remove it from the scene. The presumption being, he/she is going to secure it until other interested parties (like the insurance investigator) have opportunity to mobilize, get to the scene, and do their own independent investigation. Or, does the public investigator determine no crime, not going to get involved with a potential subrogation case and leave all

the evidence of the ignition source at the scene (for how many days until the private gets there who knows?) without securing the scene or the evidence?

There was considerable debate on both sides for both scenarios.....take the evidence, secure it for a reasonable time for the other interested parties to have opportunity to examine it, or leave it at the scene for fear or spoliation of evidence when removing it from the scene and compromising future civil litigation?

I would like to know what the public investigators do, or like to see done? What the private investigators' impression are? What scenario would best suit the interests of all/most involved?

I lean towards having the public agent secure the 'evidence'. By securing the device or item it is available for further examination and laboratory testing which may not occur if it is left behind at the scene.

However, I only support that action if the scene is documented, diagramed and photographed, prior to collecting the item or items; and only if proper procedures are followed in securing the item(s), including packaging,

tagging, filling out an evidence form, and properly securing same in a property room. i.e., treat it like you do your criminal evidence.

It also has to be readily available for examination by other investigators and released for appropriate testing. Once the initial flurry of investigative activity is through it should be released to the property owner or agent of the property owner.

*Respondent No. 1
Fire Marshall R. Davidson.*

I believe that if an appropriate policy is in place and it is followed, the securing of the device/items believed to be the cause can further the investigation process. It is those cases where items are taken and not properly documented (or are lost) or are not made available for other investigators that causes the problems.

*Respondent No. 2
IAAI Ashland District
President Chris Bloom*

This is a very touchy subject as you may well already know. However, being in the position of both public and privately conducting fire scene examinations, I understand it well.

The public investigator is required to only determine accidental or intentional acts. Anything beyond the scope of that requirement puts the investigator and the department, to be held at the same standards AND LIABILITY as the Private individuals. There is no law against the public investigator taking evidence and securing it, but with modern Spoliation issues and liability these days, it is best to leave it for the privates, unless its immediate destruction or loss is foreseen.

As far as the fire scene and evidence, the best recommendation is to contact a local fire attorney or city attorney to request their advice.

If that is not available, leave it in place for all the privates to inspect at the same time. In other words, follow the nationally accepted guidelines of Kirk's Fire Investigation, and NFPA 921.

Respondent No. 3
Un-named

The only problem with this is whether or not you released the items to the correct individuals who have primary interest in the items. In other words, just because the product allegedly failed, does not necessarily mean the company can retain it immediately. It is still the property of the fire victim or

insurance company, and they have the legal right to file several criminal charges if improperly taken.

Like it or not, we are all being held to a higher standard in the field. The following excerpt is from NFPA 921. "The fact that an investigator has authority to conduct an investigation does not necessarily mean that he or she has the legal right to enter the property that was involved in the fire. Rights of entry are frequently enumerated by statutes, rules, and regulations. Illegal entry upon the property could result in charges against the investigator (i.e., trespassing; breaking and entering; or obstructing, impeding, or hampering a criminal investigation).

Once a legal right of entry onto the property has been established, the investigator should notify any officer or authority then in charge of the scene of his or her entry. An otherwise legal right of entry does not authorize entry onto a crime scene investigation. Further authorization by the specific agency or officer in charge is required.

Once on the property, extreme caution should be exercised to preserve the scene and protect the evidence. Legal counsel should be able to anticipate needs in this regard and promptly respond to such needs.

Remain aware that investigators and others may be required to produce evidence by order of court or pursuant to a subpoena. Exercise caution. The investigator should not destroy, dispose of, or remove any evidence unless clearly and legally entitled to do so."

A Response to Chris Bloom

Would I be correct in interpreting your post as; If the public investigator follows the guidelines of 921 he/she can and should collect the evidence.? In fact, 921 recommends collecting the appliances/electrical quipment, ref. NFPA 921 9-5.6. What is not addressed in 921 is this very issue of public vs private investigator collecting evidence. I can agree with leaving the evidence IF the private is there or enroute within a timely manner. More times then not their ETA to the scene is measured in days. In this type of scenario, doesn't the public investigator assume a risk by not securing the evidence in accordance with accepted guidelines.

Again I fully agree with the scenario of a public investigator sticking his/her neck out when they start destructive testing, or in some cases...."destructive storage" (and we all have seen those scenarios).

Of course this assumes an accidental fire.....

THE DANGER OF POOL CHEMICALS

(With summer here, it is an appropriate time to take heed of the potential fire dangers associated with pool chemicals, as demonstrated by two American fires)

In less than one year's time, two significant fires in sprinklered buildings highlighted the hazard that pool chemicals present when stored indoors.

The first fire occurred in a Quincy, Massachusetts bulk retail store for home improvement products. This facility was moderately damaged by a fire that started in the pool chemical storage area. The second fire occurred in another bulk retail store in Albany, Georgia. This fire also started in the pool chemicals area; in this incident the entire 81,000 square-foot building was destroyed.

The National Fire Protection Association (NFPA) has been aware of the fire hazard potential of pool chemicals and other oxidizers and has published an oxidizer storage code addressing these storage issues since 1973.

NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, 1995 edition is the current edition of that code.

This document provides sprinkler system design criteria, quantity limitations, storage arrangement requirements and other requirements for the safe storage of commercially available liquid and solid oxidizers.

The NFPA, with the cooperation of the local fire departments and property owners, has documented these fires as part of its on going program to investigate technically significant incidents. This NFPA Alert Bulletin was prepared for members of the fire service and others in order to raise their awareness of hazards created by pool chemicals stored in retail establishments.

It is not NFPA's purpose to pass judgment on, or fix liability for, the loss of property resulting from either fire.

The Quincy Fire

The 102,000-square-foot facility was a retail and warehousing store for home improvement products. A system of metal double-row racks was used to display and store products, most of which were combustible, as were their packaging materials. Higher hazard commodities in

combustible containers were also stored in the building and mixed among the combustible commodities. For example, pool chemicals, which are classified as Class 2 and 3 oxidizers in accordance with the 1995 edition of NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, were stored in various types of plastic containers, some of which were placed in cardboard cartons. The pool chemicals were stored on the lower shelves of a double-row metal rack on one side of the longitudinal vertical flue. In the storage area on the other side of the flue were cartons containing lawnmowers. Various garden tools and supplies were stored in racks across the aisle from the pool chemicals.

The single-story building was approximately 4 years old and was protected by three wet-pipe sprinkler systems. Sprinklers were installed at ceiling level only, with additional sidewall sprinklers positioned to protect structural columns. There were no in-rack sprinklers. The building also had a public address system and a fire alarm system. The fire alarm system was activated by sprinkler waterflow switches and manual pull stations. Staff members were trained in

the procedures to take for fire and other emergencies.

The fire began when pool chemicals (oxidizers) and motor oil leaking from containers packed in the cartons containing lawnmowers reacted chemically with each other. Once ignited, the fire developed rapidly in the double-row rack of origin and spread to an adjoining rack across the aisle, generating large quantities of smoke. The 160 patrons and employees in the store safely evacuated the building before the arrival of the fire fighters.

Although fire damage was limited to two double-row racks in the area of fire origin, smoke damage occurred throughout the building because smoke filled the entire structure.

The Albany Fire

The fire at the fully-sprinklered bulk retail store in Albany, Georgia occurred at approximately 11:21 a.m.. The first fire fighters to arrive on the scene found the fire venting through the roof and through a corner of the building where walls had separated. The fire was so intense that fire fighters were unable to stop it and the entire building and its contents were destroyed.

Like the Quincy store, this facility was a bulk retail store providing home improvement products, and a wide variety of these products were warehoused on metal racks in the same area in which they were sold. Different types of products sat near each other in the racks. For example, pool chemicals packaged in various types of plastic containers and cardboard cartons were located on one end of one side of the double-row racks, while the storage area on the other side of the longitudinal vertical flue reportedly contained charcoal, lighter fluid, barbecue equipment and other barbecue supplies. A rack separated by a transverse vertical flue also contained unspecified combustible goods. There were no vertical barriers between the barbecue equipment and other combustible goods in the double-row racks and the pool chemicals, which were stored on several levels to a maximum height of approximately 12 feet.

The single-story, noncombustible, 81,000-square-foot building was approximately 3 years old. Three wet-pipe sprinkler systems protected the interior of the building, and one wet-pipe sprinkler system protected the garden center. Each wet-pipe sprinkler system was hydraulically designed to provide a discharge density of 0.33 gpm/ft² over 3,000 square

feet. Sprinklers were installed at ceiling level only, and additional sidewall sprinklers were positioned to protect structural columns. In addition, the building contained ABC dry chemical fire extinguishers, manual pull stations, a fire alarm system and a public address system. Its staff was trained to perform emergency and fire response procedures.

At the time this NFPA Alert Bulletin was prepared, fire department investigators, (in conjunction with investigators representing the property owners, their insurance carrier, and others), had determined that the fire began in the area in which the pool chemicals were stored. However, the cause of the fire was still under investigation. The fire spread quickly up the rack, producing large amounts of irritating smoke, which caused conditions in the building to deteriorate rapidly. The building's estimated 100 employees and 80 patrons safely evacuated before fire fighters arrived.

Investigators were still examining the building's automatic sprinkler system when this NFPA Alert Bulletin was prepared, and they had not identified any deficiencies or impediments in the municipal water supply. The rapidly growing fire appears to have overwhelmed the building's sprinkler systems.

Fire conditions prohibited fire fighters from performing interior fire fighting operations upon their arrival. As a result, the fire spread from one end of the building to the other, causing the entire roof to collapse. All of the building's contents were consumed.

Analysis

Even though the result of each fire was different, some factors and issues in both fires were similar. Each involved pool chemicals in plastic containers and cardboard cartons, and incompatible combustible commodities were stored on metal racks near the pool chemicals in both facilities. Though a severe fire can occur when pool chemicals come in contact with any incompatible material, the most severe fires occur when the incompatible commodities are a hydrocarbon liquid or a corrosive liquid. In both stores, some hydrocarbon liquids were stored near the pool chemicals, and in each facility the fire grew rapidly, filling each large building with smoke in a matter of minutes. Following each fire, questions were raised as to whether all occupants would have been able to escape had the fires occurred during a busier shopping period or had they been notified later in the sequence of events. The similarities between these two

incidents serve as testimony to the serious, potentially life-threatening conditions fires involving pool chemicals that can produce.

The 1995 edition of NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, provides reasonable requirements for the safe storage of pool chemicals. In fact, NFPA 430 provides basic protection requirements for all types of industrial oxidizers. For example, the document requires separation between oxidizers and incompatible combustible and flammable liquids. NFPA 430 also separates oxidizers into four classes and provides specific requirements for each class. These requirements blend sprinkler system criteria, (including the use of in-rack sprinklers), with quantity limitations and storage arrangements.

Section 2-4 of NFPA 430 provides additional requirements for storing oxidizers in retail stores. For instance, NFPA 430 requires shelves and vertical barriers between incompatible materials and limits the storage height of all oxidizers to 6 feet in these facilities.

NFPA 430 also contains requirements for manual suppression equipment, which specify the use of portable water fire extinguishers or water hose reel stations. The code prohibits the use of halon

fire extinguishers in all areas where oxidizers are stored and prohibits the use of ABC dry chemical fire extinguishers in areas used to store oxidizers that can release chlorine.

Although most oxidizing chemicals are not readily ignitable, they can increase the burning rate of combustible materials and the intensity of burning. A few oxidizing agents are even susceptible to spontaneous ignition when they come into contact with incompatible materials. These characteristics make pool chemicals more hazardous than the combustible materials that are stored and displayed in bulk retail stores - something operators and insurers of bulk retail stores must recognize when storing pool chemicals. They should also realize that this hazard will change seasonally. As spring and summer roll around, the quantities of stored pool chemicals increase and so does the potential hazard associated with them.

Appropriate actions must be taken to protect bulk retail stores against the hazard pool chemicals present. Following the requirements of national fire codes and standards, such as NFPA 430, Code for the Storage of Liquid and Solid Oxidizers, will allow bulk retailers and others to safely store quantities of pool chemicals.