THE ROLE OF FORENSIC SCIENCE IN SECURITY INVESTIGATION: A TOOL FOR COMBATING TERRORISM IN NIGERIA

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ABSTRACT

This paper discusses various aspects of terrorism and their relation to the work of forensic scientist or criminal investigator. It will concentrate on an examination of domestic terrorism and its perpetrators in Nigeria. The forensic science covers the task of gathering information on terrorism, terrorism prevention and investigation and counterterrorism. The security agencies are clearly important in assessing the threat of terrorist acts, the role of criminal investigator at the federal, state and the local law enforcement levels should not be underestimated. It is very important to explore the ways criminal investigations can assist in the fight against terrorism. Criminal investigations must be prepared to encounter and handle terrorist – incident crime scenes through forensic Science.

1.00 INTRODUCTION

Terrorism is the unlawful use or threatened use of violence by a group or individual based and operating within the country or in foreign counties.

Terrorists have a wide range of tactics available to them. Such as using various types of bombs or improvised explosive devices (IED), Skyjacking planes, hijacking vehicles, carrying hazardous materials, taking hostages, kidnapping and engaging in assassination raids and sabotage as well as launching biological, chemical, radiological and nuclear attacks.

The paper will extensively cover basic aspects of forensic science, crime scene and its safety issues. The paper will further explain how forensic science could analyse biological and chemical attacks that produce mass casualties.

Terrorists' acts involve fire, arson and explosion as a result of bombs and other types of firearms. Forensic Science involves fire, arson and explosion investigations.

In addition to the dangers already discussed, other types of terrorist acts are possible including agroterrorism threats to water supplies and the use of high–every radio frequency (HE RF) and electromagnetic pulse (EMP) weapons.

Agroterrorism is the deliberate and malicious use of biological agents as weapons against the agricultural and food supply industries. The greatest untapped resources in the fight against terrorism are the local public security and safety officers; they are an army of eyes and ears of the nation's streets.

Fire incidents and massive destructions are potentials act of terrorism and also of a crime scene.

Recognising suspicious incidents may be difficult, but being extremely alert to clues, surroundings and events will greatly assist in identification.
Clues such as occupancy location, type of event, timing of the event and on scene warming signs will help with this process.

Bombing incidents can involve a wide variety of materials from small pipe bombs to large vehicle bombs. Materials involved will always include some form of explosives.

The techniques, devices and materials employed by the arsonists or terrorists need to be known and analysed with the view to preventing terrorist attacks in future. Since there is much valuable evidence and information to be gathered during the fire, the investigator should respond to any serious or suspicious fire affecting property within his assigned area of responsibility. The difficulties that may be encountered in the search of explosion scene depend primarily on the extent to which the building or other property has been consumed. The task of collecting physical evidence in arson or fire case is complicated by the delicate condition of the materials. Any piece of evidence that appears to have unusual significance should be photographed and sketched before it is removed, to avoid displacement.

Fig. 1: A Building on Fire

2.00 NATURE, SCOPE AND FUNCTIONS OF FORENSIC SCIENCE

The word forensic comes from the Latin adjective forensic, meaning "*of or before the forum*". In Roman times, a criminal charge meant presenting the case before a group of public individuals in the forum. Both the person accused of the crime; and his side of the story will determine the outcome of the case. Basically, the person with the sharpest forensic skills would win. This origin is the source of the two modern usages of the word forensic – as a form of legal evidence and as a category of public presentation.

The term "forensics" in place of "*forensic science*" can be considered incorrect as the term "forensic" is effectively a synonym for "legal" or "related to courts". However, the term is now so closely associated with the scientific field that many dictionaries include the meaning that equates the word "forensics" with forensic science".

ANATOMY OF FORENSIC SCIENCE

Forensic science is a very interesting study and refers to something "*of pertaining to, or used in a court of law*". In today's day and age, it almost always refers to a method of obtaining criminal evidence for the purpose of using it in a court of law. The various aspects that will be examined in this paper will introduce you to; definition and meaning of forensic science, characteristics of forensic science, subdivision of forensic science, forensic profiling, and forensic identification. Forensic science is the practical application of numerous sciences to solve legal system – related questions, which can include either a civil or criminal action or suit.

The use of the term "forensics" in place of "forensic science" is actually a globally–accepted misnomer considering that the term "forensic" is effectively a synonym for "legal" or "pertaining to court", from the root Latin meaning. Because it is now so closely associated with the criminal scientific field, many dictionaries equate the word "forensics" with forensic science". Forensic science extends into a broad range of sub-sciences which utilises natural science technique to obtain relevant criminal and legal evidence.

Also, forensic science (often shortened to forensics) is the application of a broad spectrum of science to answer questions of interest to a legal system. This may be in relation to a crime or a civil action. Besides, its relevance to a legal system, more generally, forensics encompasses the accepted scholarly or scientific methodology and norms under which the facts regarding an event, or an artefact or some other physical item (such as a corpse) are ascertained as being the case. In that regard, the concept is related to the notion of authentication, whereby an interest outside of a legal form exists in determining whether an object is what it purports to be, or is alleged as being.

Forensic science applies science principles, techniques, and methods to the investigation of crime. A lesser known definition of the adjective *forensic* is anything argumentative or debatable. At first, this definition of forensic may seem to have no connection with the more popular crime-solving definition—but it does. Legal truth is sought through the use of the adversarial system (rather than the scientific method), and decisions are made only after each side has been given an equal opportunity to argue all the issues at hand. When one of the issues being argued is a scientific analysis (using the scientific method) of an item of evidence, the debate that ensues over the science involved could be called forensic science.

Other related definitions of forensic may include (1) the use of science to aid in the resolution of legal matters and (2) a scientific analysis for the purpose of judicial resolve. For example, saying that something was forensically determined suggests the information was scientifically determined with the intent to be presented (and debated) in a court of law.

Recently, the term forensic has also been used to describe many scientific investigations—even if no

crime is suspected. Often these investigations are of historical significance and may or may not have legal consequences. For example, a forensic scientist may work on the discovery of the composition of ancient pottery, the detection of Renaissance art techniques, or the identification of ancient human remains.

3.00 SCIENTIFIC KNOWLEDGE AND SKILLS: Techniques and Strategies

Branches of Science

The branches of science are as follows:

Formal Science includes Mathematics (Geometry, Algebra, Trigonometry, and Arithmetic), Logic, Theoretical Physics, Statistics, etc. Empirical Science includes Physics, Chemistry, Biology, Psychology, Botany, Zoology, Biochemistry, Microbiology, Geology, Medical Science, etc.

Formal Science has a formal and deductive character. Science is said to be formal if its contents, arguments and procedures obey certain rules. The results and conclusions are valid and authentic only if they conform to those rules. A systematic body of scientific knowledge must have clearly defined terms and concepts, inference and formula to arrive at its conclusions. Thus, a body of formal science is systematic and deductive in character.

Empirical Sciences, deal mainly with materials drawn from experience. It also deals with the nature and functioning of objects like the human body, and bodies of other animals, natural objects (e.g. the weather, diseases, plants, insects, etc.). The knowledge derived in empirical sciences includes inductive generalisations, laws and theories which we formulate in clearly defined statements, propositions or in statistical equations or formulae.

Other Broad Divisions of the Sciences

Apart from the distinction between formal and empirical sciences, scientific disciplines according to two classes of objects or phenomenon are as follows:

a. Natural Sciences deal with all natural objects. Under it, we have other branches such as:
   - Physical Sciences e.g. Physics, Chemistry, Biochemistry, Geology, Applied Mathematics, Astronomy, etc. these deal with physical and inanimate objects.
   - Biological Sciences. These deal with living bodies such as human beings, animals, insects and plants. They include Biology, Zoology, Botany, Microbiology, etc.
   - Medical Science deals with objects and problems that affect human and animal health. They include General Medicine, Anatomy, Surgery, Physiology, Neurology, Veterinary Medicine, etc.
   - Pharmaceutical Science which is concerned with drugs and content of plants and other objects.

b. Social sciences deal with society and social institutions (e.g. Economics, Social Psychology, Sociology and Anthropology, Geography, Social Philosophy, etc.).

c. Human Science. There has been a progressive attempt to extend the procedure and techniques of science such as systematisation, deduction, statistical and mathematical formulae and even experimentation to the study of the humanities especially language, music, drama and poetry, art, history.

Science enables us to attain a systematic, objective and reliable body of knowledge of the world and of ourselves. Being systematic means that all the various elements in a body of scientific knowledge are logically related and each can be inferred from the other. Being objective means that all those who adopt the same method or procedure can prove or verify the claims or statements which the body of scientific knowledge contains.

Being reliable means that the body of scientific knowledge can enable us to adequately and correctly explain, predict and control any phenomenon in question.

Thus, science aims at enabling man to explain how the world, events and objects around him originate, develop, operate or function. It also helps him to predict how they will behave in future and thus enables him to control the behaviour of things around him, once he is able to develop the appropriate instruments for such control. We can therefore say that science is theoretical knowledge about the world (*in terms of concepts, laws, and theories*) which helps us to express and systematise our understanding of objects and phenomena. It also equips us with practical knowledge in terms of the various ways, mechanisms and instruments which enable us to control objects and phenomena. Science is, therefore, not only a source of knowledge; it is also a source of power. Generally, scientific knowledge is said to be objective, factual, systematic, verifiable and quantifiable.

Scientific Knowledge

Scientific activity is the human experience by observing objects and events. Events in this sense could be regarded as interactions among objects. One does not have to be a scientist in order to recognise that some objects have striking similarities and that under similar conditions; these objects appear to interact in similar ways.

People's modes of behaviours are often based on concepts and structures that reflect internal assumptions about the similarity of objects and the consistent manner in which they interact. These internal assumptions are always interpreted in various ways by people. For people with little or no scientific background, such assumptions are usually based upon social, religious or cultural experiences acquired through communication with other people.

Science and scientific knowledge militates against assumptions. Science suggests that there is a better way to deal with the biological and physical worlds. Scientific knowledge and activities strive to articulate natural phenomena with some systematic scheme that can be used as a framework for perceiving, organising and dealing with these phenomena in more rational ways.

Science is a human activity and scientific knowledge is a human creation. For it to be communicated to other persons or stored for future reference, scientific knowledge is expressed in symbols.

Natural phenomena or objects must be well classified before relationships could be interpreted. These objects must first be classified into groups and then the interactions among them also classified, that is the events between the objects. Once objects and events have been classified into types, one can then look for consistency in the types of interactions that occur among a selected set of objects under a given set of conditions. Such a consistency, when found is interpreted as a relationship among classes of objects under certain conditions and may be thought of as an empirical law.

The Scientific Method

Scientific method is meant to be the method of reporting scientific information. The various steps in scientific method are:

1. Stating the problem
2. Formulating hypothesis
3. Designing experiments
4. Observation
5. Collecting data from experiment
6. Conclusions

The disciplines of science are meaningless unless they are geared towards practical application in human affairs. To Dewey (1966), science is the outcome of methods of observation and testing which are deliberately adopted to secure a settled assured subject matter. Scientific method to him therefore, is a non-authoritarian democratic self-correcting intellectual and moral authority by which man may govern his actions.

At the experimentation stage, one must devise a control which is a condition or situation which is neutral to the test in hand, and whose effects, if any, are known completely as far as the test in question is concerned. Principles and theories emerge from the results of such conclusions as they emanate from the scientific method.

Science therefore is not just learning about knowledge but doing things. To experience the language, the process (method) of doing these things to experience knowledge is what is referred to as the scientific method. Science as a process or way of knowing consists of local methods of approach and the right attitudes of mind which guide inquiring into truth about natural phenomena. The scientific approach to inquiring and problem solving involves the scientific method, and the various steps which have been given earlier science as product yields scientific hypotheses' theories, principles and laws.

Science Process Skills

The development of science process skills is a very important objective of science. This is because these process skills play vital roles in scientific and technological activities. They are often seen as the foundation of scientific enquiry. Since they can be generalised and are required for carrying out scientific activity.

Science process skills can be defined as ways in which scientists carry out their activities or the methods scientists use in arriving at a decision. These science process skills are: observing, classifying, comparing, counting, measuring, raising questions, hypotheses, predicting, making operational definitions, controlling or manipulating variables, experimenting, collecting data, interpreting data, inferring and manipulating apparatus.

Each of the process skill is stated as follows:

1. Observing**:** This is a common but often misused process skill. It is more than just seeing. One can use all the senses – seeing, tasting, touching, smelling to observe. Observing is the act of paying particular attention to what one experiences with his senses.

2. Classifying**:** This depends on careful observation. It is the sorting out of objects into groups according to some identified properties.

3. Comparing**:** This is the act of comparing two or more objects. Comparison of objects can be made at varying levels of difficulty.

4. Counting of Numbers: This is basically an arithmetic process but is a very important process of science. It involves the use of numbers in addition, subtraction, division and multiplication.

5. Measuring: This process involves the use of an instrument to determine the quantitative value associated with the properties of objects.
6. Raising Questions: Scientists would always want to know many things in their environment. They do so by asking such questions as how, why, when, to what extent among others. Such questions lead to investigations.
7. Formulating Hypotheses: When scientists raise questions on any aspect of nature, they also make intelligent guesses which are referred to as hypotheses. These hypotheses are either accepted or rejected after investigation has been completed. This involves telling future observation on the basis of previous information. The nature of an event being predicted and the accuracy of other past observations determine the reliability of our prediction. The prediction has to be tested or verified through investigations.
8. Making Operational Definition: This refers to defining terms used in a particular context under reference. This is necessary because it enables any person reading a report arising from scientific investigations to understand it the way the writer expects.
9. Controlling or Manipulating Variable: A variable is something that is capable of change. This is closely linked with experimentation.
10. Experimentation: This is an act of testing an idea through practical investigation. The investigation can be based on some information or it may be on the basis of trial and error.
11. Data Collecting: This is an act of gathering relevant information. It is an essential element in many scientific investigations.
12. Interpreting Data: The process of interpreting implies that scientists should provide a meaning to their experiences, and to provide justification for such meaning.
13. Inferring: This involves making a general statement based on the data collected and interpreted. It is an attempt to generalise to other situations on the basis of sufficient evidence obtained.

Role of a Forensic Scientist and Criminal Investigation

Most forensic scientists analyse evidence in a crime laboratory and spend little time at the crime scene. The duties of forensic scientists are not exactly as they are portrayed on many popular television shows, where the crime scene investigator plays the role of Sherlock Holmes and does everything from collecting the evidence to solving the crime.

In real life a team of experts does the job of television's crime scene investigators. The forensic scientists do not directly solve crimes; they simply analyse the physical evidence. Physical evidence includes all objects collected and packaged at a crime scene that will be subsequently analysed in a crime laboratory.

This evidence is typically collected by police officers or specially trained crime scene investigators; however, the evidence of a crime is not limited to those items sent to the crime laboratory. Other evidence may include interrogations, eye witness stories, police reports, crime scene notes and sketches, and anything else determined to aid in the investigation. Subsequently, the detective assigned to the case pieces together all the evidence in an attempt to solve the crime. Interpretation of all the evidence and the accompanying scientific results is also practiced by many attorneys, but typically the forensic scientist.

Evidence collected at crime scene of suspected arsons is examined to identify accelerants incendiaries and incendiary – device components. Evidence collected at explosion scenes is examined to identify explosives used, blasting caps, leg wires, fuses, timing mechanisms, energy sources, containers, wires, tapes and various other component parts used to make the bomb. The laboratory system maintains liaison with who provide examples of new explosive.

Comparative trace evidence examinations are conducted on materials including tapes, wires, glass, metals, soil hair paint, fibres, paper and wood to determine whether the materials could have a common origin and thereby associate a suspect with a crime.

4.00 PHYSICAL MATCH AND FORENSIC SCIENCE

A physical match is the classic example of an individual characteristic. A physical match, or jigsaw fit, is what occurs when a questioned and a known sample fit together like puzzle pieces. For example, a diamond might be chipped as it is being forcibly removed from a ring during the commission of a crime. If the chipped piece is located at the crime scene with the ring, and the diamond is recovered from the suspect, all that may be needed to link the diamond to the same origin as the chipped piece (the victim's ring) is a physical match seen under a microscope.

Other common items of evidence having individual characteristics include fingerprints, footwear impressions, tool marks, and bullets. Comparative analyses of all these items of evidence often result in a linkage to a single origin when the questioned sample is compared to several known samples. In the case of a DNA or fingerprint analysis, a link can be made exclusively to a single person. In the case of a footwear or tool mark impression, if individual characteristics are present (which is not always the case), a link can be made to a single shoe or tool, respectively.

Fig. 2: Use of a Dust-Mark/Electrostatic Lifter

Fig.2 shows a court display that compares the footwear impression found at a crime scene to one from a known source. In addition to class characteristics like tread pattern and size, the impression displays individual characteristics (marked in yellow in the figure) that link it to a specific origin. However, as mentioned earlier, many items of evidence do not have individual characteristics that can be used for individualisation so investigators must rely solely on class characteristics.

Fig. 3: Shoe Print Image Capture and Retrieval

Fig.3 gives examples of class and individual characteristics for common physical evidence.

Powder Dusting and Forensic Science

Powder dusting involves the use of fine powders to visualise latent fingerprints. It works well on smooth nonporous surfaces such as glass, certain plastics, and ceramics but is less effective on porous surfaces such as paper or sticky surfaces. Among the many components of fingerprint residue, sebum and perspiration tend to adhere to powder particles. This physical property of fingerprint residue, in conjunction

with the fact that many smooth, nonporous surfaces do not adhere well to powder particles, allows for fingerprint development. The contrast developed between the adhered powder and the surface allows for visualisation. The same concept is illustrated when spilled flour sticks to residue on the counter or when beard and moustache shavings stick to the toothpaste stains in the sink.

Investigators use many different types of powders. Most black powders are made from fine carbon or iron. Light-coloured gray or white powders can be made of any number of substances, such as finely divided aluminium. There are also fluorescent powders in red, green, yellow, or orange, some of which may also contain iron particles. Any powder containing iron may be applied with a magnetic applicator. The magnetic applicator, a small cylinder the size of a marker or pencil, contains a sliding magnet that can be moved up or down the inside of the cylinder. When the magnet is positioned at the tip of the applicator inside the cylinder, powder containing iron will adhere to the tip and provide a collection of powder for application. Sliding the magnet away from the tip will release any excess powder. Other powders are typically applied with a variety of fine brushes made of animal hair or synthetic fibres.

Whether magnetic or nonmagnetic powder or black or fluorescent powder is used depends on personal preference and the contrast needed. Some forensic scientists prefer magnetic powders because they believe brush bristles damage the fingerprint; others think magnetic powders are too messy. Once the powder has been applied and contrast can be seen, the fingerprint can be lifted and preserved using fingerprint tape, a high-quality transparent tape typically at least an inch wide. The lifted fingerprint can then be placed onto a fingerprint lift card that offers the greatest contrast (black for white-powder lifts and white for black-powder lifts). Identifying information such as the name of the investigator, date and time of collection, location of fingerprint, and case number all should be recorded on the card.

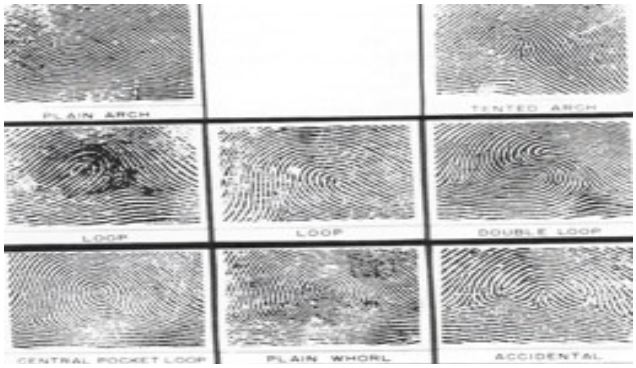

Fig.4 shows a fingerprint lift of a black powder impression

FORENSIC SCIENCE AND SECURITY INVESTIGATIONS

Forensic science is the application of science to law. Any science can be applied into a legal situation, but some of the commonest forensic sciences include forensic biology, forensic chemistry, and forensic toxicology. The word forensic in today's world simply means the application of something to a legal situation. When used in the term, forensic science means applying SCIENCE into a legal setting. The important word here is SCIENCE. Therefore, you CANNOT be a forensic scientist without first being a scientist and a very good and well educated scientist as you will not only be analysing and interpreting evidence which could be responsible for setting a person free or imprisoning them for life, but also you will and should be challenged to the utmost during cross-examination in court. Therefore, the science must come first. If you wish to be, for instance, a Forensic Chemist, you must be a top of the line chemist first. Then you will be trained to apply your knowledge of chemistry into a legal setting. In most cases, forensic science is little different from other branches of science. We just use our expertise to help solve crimes.

Evidence Recovery

Evidence Recovery is the process by which trained and qualified scientists search, identify, and recover forensically significant trace evidence material from exhibits1 submitted as part of a criminal investigation. In the context of the forensic laboratory, Evidence Recovery is the first step in a process that ultimately attempts to establish a particular association: between two (or more) persons (e.g. suspect and victim), a person and a place (e.g. suspect and crime scene), and/or a person and an object (i.e. suspect and weapon).

Fig. 5: Scene of Suicide Attack
Source: Home Office in partnership with the Centre for the Protection of National Infrastructure and the National Counter-Terrorism Security Office

Fig. 6: A Forensic Laboratory

Crime Laboratory
Once the search, identification, and recovery of the evidence is complete, it can then be analysed, compared, and interpreted by other qualified forensic scientists. All of the work in Evidence Recovery is performed by using established and accredited scientific methodology in fields such as Biology and Chemistry. Although the Evidence Recovery Unit of the RCMP Forensic Laboratory System is described here, other laboratories across the country perform the same work, albeit sometimes under different titles and in different sections. Other laboratories may have slight differences in their structure; for instance, in which individual is responsible for each step in the processing of the evidence. Contact individual laboratories for details.

The Role of Search Technologist in the Field of Forensic Science
A technologist specialised in Evidence Recovery (such as a Search Technologist) typically will spend most of his/her day at the bench, performing the identification and recovery of specific biological evidence, such as semen, blood, saliva, hair, and trace DNA, as well as non-biological trace evidence, such as paint, glass and fibres, as the case may dictate.

As primary examiners in the forensic process, STs hold a great deal of responsibility in that their examinations and decisions in a case will have a great effect in the subsequent analysis and interpretation of the evidence.

Search Technologists are required to keep an accurate description of their examinations and results, and are also responsible for the continuity of the evidence they examine. They also regularly interact with other members of the laboratory in order to obtain the necessary information to proceed with an examination, or to obtain the assistance needed to perform a specialised analysis.

Search Technologists are primarily "bench scientists", but on rare occasions are called out to assist in the examination of crime scenes, where they mainly act in an advisory role to police investigators.

One of the most challenging and unique aspects of an ST's role (and for any kind of forensic scientist) is having to defend the results of his/her examinations in a court of law. As technologists, STs are only called to defend the actual results of their examinations (they generally do not interpret the results) and are not

required to attend court as often as forensic specialists, who are mainly responsible for the interpretation and reporting of evidence.

Forensic Biology and Forensic Investigation

Forensic Biology involves the examination of exhibit material to recover sources of DNA for subsequent DNA profiling. There is a three-way division of labour in the Biology section in the RCMP:

1. Evidence Recovery Unit (searching of exhibits). See above.
2. Biology Analytical (extraction, quantification, amplification of DNA) and
3. Biology reporting (application of DNA profiling software, comparison of generated profiles and statistical interpretation of any matches obtained).

In the Biology Discipline, assault cases are the majority of cases that are examined. They sub-classify into the various degrees of sexual and aggravated assault and, the most ultimate of assaults: homicide. With the introduction of Bill C-13, virtually all types of property crimes will now also be examined. Again, different labs may use different terminology and titles, although the job itself remains the same.

Forensic Chemistry and Scientific Investigation

Forensic chemistry in Canada refers to the chemical analysis of materials in support of the Justice System. This includes the analysis of fire debris for ignitable liquids, Gun Shot Residue (GSR), paint, glass, fibres, explosives, building materials and soil.

The types of cases that a forensic chemist will analyse include:

- Fire debris analysis – examining fire debris, suspect clothing and items from the deceased, for ignitable liquids.
- Gun Shot Residue – GSR is the micron sized particles containing barium, antimony and lead, from a fired weapon. If these particles are found on a person or in a location, it can be confirmed that contact has been made with a fired weapon.

Fig. 7:

Forensic Toxicology

Forensic toxicology is quite different from forensic chemistry. Whereas a forensic chemist performs chemical analyses of a myriad of everyday materials, forensic toxicologists concentrate on the chemicals found in body fluids, primarily drugs, alcohol, and poisons and with chemicals related to the making and use of drugs such as methamphetamine labs, needles and spoons. Forensic toxicologists also provide an interpretation of these findings for investigatory and court purposes.

Fig. 8:

Questioned Documents and Forensic Investigation
Science is seen as a system of thought. It is generally described as a process of thinking, a means of acquiring new knowledge and a means of understanding the natural world, science involves the following factors:

5.00 SCIENTIFIC KNOWLEDGE AND SKILLS

This involves:
a. a body of knowledge;
b. a method for acquiring knowledge or cognising (studying and understanding) the world;
c. an instrument which enables us to practically transform the world in accordance with our purpose and institution.

a. As a body of knowledge: scientific knowledge differs from other forms of knowledge in both content and form. It deals with the material aspects of reality. It shows what is in the world, how the world (reality) and at its various aspects function, their various properties and the changes which they undergo. Science expresses this knowledge in quantifiable terms, in concepts, laws and theories. Science has branches which can be grouped into formal science and empirical science. They differ from other branches of knowledge, say the humanities or arts.

b. As a method for acquiring knowledge: Empirical science proceeds by way of observation, experimentation, forming of hypothesis, testing, use of instruments, and formation of theories. Formal science utilises concepts, rules and theories expressing them in quantitative and statistical manner and finally, expressing knowledge so obtained in systematic and deductive form.

c. The body of knowledge and method of science are instruments in our hands for transforming the world in a practical manner. The practical application of science is technology which we see in the complex material structures and objects which humanity has created to serve his purpose. Thus, scientific knowledge enables us to understand and explain the world, to predict and change the world.

The co-operation and interaction among them makes the development of science possible and reliable. Among them, there is a common belief in the method and efficacy of science.

6.00 CONCLUSION

From the above illustration it is clear that forensic science involves the tasks of collecting physical evidence in Crime Scene like terrorists' attack events. It is important to ensure that every piece of evidence that appears to have unusual significance should be photographed and sketched before it is moved to avoid displacement. A photograph record should be made of the destruction accomplished by the fire and of physical evidence uncovered by the security.

Fire incidents and massive destructions are potential act of terrorism and also of a crime scene. While there will be similarities between terror and non-terrorism events such as mass casualty incidents considerations, complicating factor to responder operations. Regardless of the mechanism or motive behind the incident, responders should remain focused on reducing the impact of the terrorism event as efficiently and safely as possible. All responders should follow established operating guidelines that are pertinent to their respective agency. All the responders on the scene should operate under an incident command system. Recognising suspicious indents may be difficult but being extremely alert to clues, surrounding and events will greatly assist in such as occupancy location, type of events, timing of the event and on-scene warning signs will help with this process.

Public safety will largely depend on the ability of responders to effectively conduct a hazard and risk analysis of the affected areas of terrorists' incidents.

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