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1988/89

THE UNIVERSITY OF ZAMBIA

SCHOOL OF LAW

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HENRY KABASO CHISHA

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CONTRIBUTION OF FORENSIC SCIENCE TO THE CRIMINAL
JUSTICE SYSTEM IN ZAMBIA WITH EMPHASIS ON
FIREARM CASES

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THE UNIVERSITY OF ZAMBIA

SCHOOL OF LAW

CONTRIBUTION OF FORENSIC
SCIENCE TO THE CRIMINAL
JUSTICE SYSTEM IN ZAMBIA
WITH EMPHASIS ON FIREARM
CASES

BY

HENRY KABASO CHISHA

SUBMITTED IN PARTIAL FULFILMENT OF THE BACHELOR
OF LAWS DEGREE.

SUPERVISOR: MR ENOCH M. SIMALUWANI

DEDICATION

TO MY DEAREST WIFE ELIDAH B. A CONSTANT COMPANION,
ADVISOR, TEACHER, COUNSELLOR AND LOVING PARTNER -
THANK YOU FOR UNDERSTANDING ME:

TO HAMOCK AND SHEBA, MY KIDS; MAY THEY GROW TO
KNOW THE MEANING OF EDUCATION:

TO ALL POLICE OFFICERS WHO MET THEIR UNTIMELY
DEATHS IN THE COURSE OF DUTY TRYING TO MAKE
ZAMBIA PEACEFUL.

A C K N O W L E D G E M E N T S

I would like to show my sincere appreciations, first to Mr Enoch Mweetwa Simaluwani who has been my tutor for this essay. He gave me constructive advice and direction in research. He showed me a lot of understanding and gave me an opportunity to have a lot of fruitful discussions in the course of writing this essay. Without his patience and direction this piece of work was not going to come out in good time. The whole essay owes him an appreciation which I readily give and it comes from the bottom of my heart. Thank you very much.

Secondly I would like to express my special appreciations to my wife Elidah.B. Chisha who has been kind enough to read through this work, although she rarely understood what the topic was all about. Thanks for the encouragement you have given me to study hard and 'pushings' to finish this essay in time. I admire your great patience and sence of endurance you have displayed during my absence and the sense of management in taking care of the home and the children. Thank you very much for typing this work, which sometimes interfered with your busy office schedule - once more thank you very much 'old girl.'

Thirdly, I would like to thank the Inspector-General of Police for allowing me to pursue my studies by granting me study leave.

Mrs Nancy W. Chingaipe, thank you for the encouragement and support during my 'Shibukeni.'

My last but definitely not the least, appreciation which is also very special should go to my mother Rosa and my late father David. I wish they were able to read and understand what I am trying to convey to them. To them I say thank you for being my wonderful parents.

I do not claim to write cardinal truths free from errors and I do not claim to exhaust the topic. Any errors or mistatements or omissions which may be discovered in this essay are mine. They should not be attributed to anybody else whether living or dead. I take full responsibility for them.

H.K. CHISHA
JUNE 1989

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OVERVIEW

The gist of this paper is to explore the role of Forensic Science plays in the solving of crimes. The most wellknown science branch is fingerprint which has enjoyed publicity in both press, books and on films.

Ballistics is relatively new in its application to criminal justice in this country, and very little literature is available on the subject.

The essay will attempt to show the basics of the sciences in general, tracing the early scientists and their contribution to the field of police investigation. It is interesting to note that the earliest scientists were not trained in the actual fields of Forensic Sciences but were brought into them to fill the vacuum and help communities. It is true that most of them were not full time employees as forensic scientists.

Forensic Ballistics Examination apart from being relatively new in this country has not been as common as fingerprint work and doctors' examinations because the incidences involving firearms were very few until the advent of late 60s. The publicity of cases involving use of firearms alarmed the nation which led National Council to pass resolutions to stiffen laws relating to commission of offences using firearms. The laws on illegal use of firearm has had a profound transformation through Parliamentary

enactment to an extent of creating capital offences in some cases. This aspect of capital sentencing has brought a high demand for Ballistics examinations to be available in serious matters involving use of firearm in committing certain offences.

What is contained here is the court's views on such cases and discussion is limited to cases which have gone to higher courts. The explanation is given on how the examination is done to reach certain conclusions and some long held myths on guns are explained and in some cases confirmed and at times dispelled.

The idea of limiting this discussion to the field of Forensic Science involving firearms was to try and explore the field and gauge the views of legal fraternity in relation to this science. In the final analysis it is hoped that though the topic is mainly scientific in content, it will stimulate the interest of legal fraternity to read more on this subject, and relate it to the laws of the country. And also to try and evaluate the impact of science on laws covering some offences under the Penal Code, Cap 146 of the Laws of Zambia and the Firearms Act, Cap 111. The idea of limiting it to one branch is because the author has much more sources and personal knowledge in this field of Forensic Science. It is also ideal to explore it in detail reflecting the local circumstances.

CHAPTER ONE

INTRODUCTION

Science in general has come to play an important role in aiding solving some of the crimes committed in everyday life of society.

The trend of co-operation between the Police investigation and science has increased tremendously since the end of second world war.

The kind of science which is used in the Police investigation is termed "Forensic Science", which is the application of scientific techniques to provide objective, circumstantial evidence to the administration of Law.¹ This paper will limit itself to immediate police application of science of their interest. The field of interest of science to police work in which they are mostly trained embraces, Ballistics, Bomb disposal, Handwriting, Photography, Statistics and Scenes of crime examination. On the American Continent these types of sciences are called criminalist.²

Other fields of crime investigation are not strictly part of Police Operation in United Kingdom and former colonies including Zambia. These render valuable assistance to the administration of criminal justice.

The relationship between the forensic science laboratories and the Police service varies. In United Kingdom where the Forensic Science Laboratories are

controlled by the Home Office, Police officers are welcome members of the laboratory staff.³ English laboratories are not concerned with the enforcement of food and drugs legislation, nor with fingerprint examination which is the business of specialist Police departments. But in New Zealand all Forensic Science work is done by the Department of Scientific and Industrial Research Unit. New Zealand claim for this arrangement, two distinct advantages namely, the Department deals with the whole range of government scientific work and scientific work and scientists of every conceivable kind including many specialists who would find no place in a forensic science laboratory in the United Kingdom, are under one roof. They argue that a scientist giving evidence at court is seen as an independent figure and is not labelled as "prosecution witness" and should not be subjected to mortifying cross-examination.

In United States, some laboratories are directed by Police officers but this is presumably because the police officer concerned is a trained scientist. The Zambian picture is that some sections are under Police direction while others like Pathology is in the hands of Ministry of Health, Geological Survey in the Ministry of Mines, Office of the Public Analyst based at University Teaching Hospital and Wild Life Laboratory Assessment based at

Chilanga. The Police and the defence counsel are permitted to call upon these institutions for help in times of need.

It is worth noting from the beginning that forensic scientists possessing a wide array of analytical skills direct their expertise to problems of reconstructing criminal acts, identifying physical evidence, linking offenders with their victims, as well as exonerating falsely accused people. In most cases the forensic scientist, through the application and interpretation of various scientific tests, supplies valuable information which cannot be determined by other conventional methods of investigation.

REASONS FOR SCIENTIFIC EVIDENCE

In these days when increasing doubts are expressed on the usefulness of confessions and identifications, it is necessary to ensure that all possible evidence at the scene of the crime is captured and subsequently examined. The doubt usually expressed can be gleaned from the Times of Zambia⁴ where while discussing the case of manslaughter involving six senior Army Officers who caused the death of a soldier under suspicion of stealing guns, the author said;

"the state tends to lose a number of good cases because of Police officers who use duress torture before getting the hapless suspect to sign the warn and caution confession statement"⁵

By the tone of this statement, it can be interpreted that the police should not heavily rely on confessions but on other independent, especially physical evidence. In the case of S v Mc C (or se S) and M (D.S. intervener)⁶ a matrimonial dispute involving the paternity of the child, LORD REID held that:-

"On the trial of an issue as to the legitimacy of a child, it was in the interest of the child and also of justice that the court should have had before it, all the best evidence available, including modern scientific evidence as provided by blood tests which might resolve the issue conclusively."⁷

The courts have made it obligatory that physical evidence which are capable of being examined scientifically should be done because failure to carry out such examination will give the suspect the benefit of doubt. This was aptly stated in the case of Kalebu Banda v The People⁸ a case of aggravated robbery where a taxi driver was robbed of his vehicle and other items. The court heard as one of the grounds of appeal that the police failed to lift the fingerprints from the vehicle which could have eliminated the appellant or put him at the scene of robbery. BARON, D C J observed that:-

"where the nature of a given criminal case necessitates that a relevant matter must be investigated but the investigating agency fails to investigate it in circumstances amounting to a dereliction of duty and in consequence of that dereliction of duty the accused is seriously prejudiced because evidence which might have been favourable to him has not been adduced, the dereliction of duty will operate in favour of the accused and result in an acquittal

unless the evidence given on behalf of the prosecution is so overwhelming as to offset the prejudice which might have arisen from the dereliction of duty"⁹

Another reason given is that traditionally lawyers have developed a strong tendency of belief in parole evidence without considering some fallibility which may arise, unless it suits them on their side. All court lawyers are familiar with the problems of the unreliable witness and the discrepancies between various witnesses' accounts of the same event which might have taken place months or sometimes years. Lawyers tend to say that one witness must be lying and indeed, some discrepancies may be due to deliberate lying. However, the deliberate perjurer is probably a much rarer animal than most lawyers imagine. The honestly mistaken witness is probably more common and perhaps more dangerous because he or she is more convincing.

Psychologists have shown that there are two main sources of error in recollection, these are errors of perception and errors of recall which is the memory. Convincing evidence is available which shows that little of what we remember remains unchanged for long. One of the greatest dangers, therefore, of this process is not that a witness forgets something, but that he, through a trick of memory, genuinely believes that he saw or heard something he did not. Another recognised mechanism

affecting memory is the process of transference whereby an event being remembered as belonging to a different occasion from the one on which it actually happened.¹⁰

The courts should, therefore seize an objective scientific evidence where possible, as a valuable method of checking or collecting other evidence. Because examination of physical evidence is incorruptible, disinterested and enduring testimony from which mistaken, inaccurate and biased perception, as well as evil intention, perjury and unlawful co-operation, are excluded. From this assertion most lawyers and scientists would agree that science has a vital role to play in the investigation of crime and the administration of legal justice.

GREAT PUBLIC EXPECTATION

The public nowadays is very enlightened about the police work. Through newspaper articles, television, radio and movies, the public has gained the impression that every crime can be immediately solved by the use of science. They naturally expect their local police to utilize science to quickly solve crimes - even when science can really be of no help. This belief is especially apparent at scenes of crime - the public expects the police to perform some scientific wizardly that will tell him the perpetrator's name and address. Regardless of what the investigator has in mind, from

the stand point of public relations the investigator must do something at the scene that looks scientific.¹¹

LIMITS OF SCIENTIFIC INSTITUTIONS IN ZAMBIA

Forensic Science application to crime solving is expanding rapidly. Some authors have limited the coverage of the field to fourteen main areas of science¹² but at the 1984 Forensic Science Society Meeting, twenty main areas were grouped with five hundred and sixty-two¹³ papers presented on various subjects.

Therefore there is a general expectation that national crime laboratories are supposed to be composed of a reasonable number of sections. It can be candidly stated laboratories in Zambia, both those operated by the police and other institutions are small comparing to developing countries. There is lack of machinery, trained manpower and the population rate and its crime does not sometimes warrant the huge capital investment in very expensive machineries which may end up being under utilized. In Zambia, institution from which criminal justice usually solicit for help range from the university of Zambia, Government Public Analyst for the examination of toxic substances, chemical analysis, drug and biological analysis, State Forensic Pathologist's office together with government medical officers and the University Teaching Hospital on postmortems and other related cases

of medical nature, Geological Survey and Mine Essay Laboratories for the examination of minerals. In this paper none of the section outside police sections will be covered. Some of these sections are beyond the capacity of this research. This paper will concentrate only on one section of Police Science Wing dealing with Ballistics. I am quite aware that this is a broad subject on which some volumes have been written but I will limit myself to local circumstances and callings on my personal experience in the field. I am fully aware that the subject of Forensic Examination of Documents has been ably and competently covered by Mr Francis K NDHLOVU in the Role of Forensic Examination of Questioned Documents in the Administration of Justice.¹⁴

Other police science subjects have not been subjects of contention in our courts and therefore availability of materials on points of law will be very difficult to obtain. Most of those subjects will not be commented upon.

ORGANISATION OF THIS PAPER

The research for this paper will come from books, periodicals, journals and newspapers and will be supplemented by personal interviews and comments from court cases. This paper is attempting to look at the cases involving the use of firearms in broad perspective. The

analysis will concern itself on the pattern of Examination in the laboratory and the reception of evidence in courts.

Chapter Two has set itself to explore the history of science in police work, outlining the earliest scientists and the establishment of Police laboratories in Europe as well as in America. It focuses attention on the development of fingerprint as a means of identification of an individual and the scientists behind its development up to the present moment. This section then looks at the subject of the firearms examination and the development of ammunition in its early stages and then looks at scientific application of identification in linking a firearm to a particular scene of crime. In conclusion the chapter is devoted to the historical development of the use of science in Northern Rhodesia to date in the present day Zambia.

Chapter three concerns itself with the Forensic Ballistics Examination of firearm as an aid to police investigation and how the firearms identification is conducted. It investigates how the definition of the firearm has been commented upon, qualified and restricted over the years. This chapter shows the pattern of how the examination is conducted and what answers are provided from this kind of examination. The last part concerns itself with the court's reception of the expert evidence.

Chapter four is the concluding part of the essay.

It has looked on how the defence treats the expert in court, what other definitions of the firearm could be interpreted and a brief summary is offered ending with the recommendation which the author feels should be looked at under the Firearms Act and the Penal Code.

FOOTNOTES

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CHAPTER TWO

HISTORY OF SCIENCE IN POLICE WORK

The history of Science in the work of Police Investigation dates back to very early times.

In the English speaking Europe there is always a mention made of the legendary Sherlock Holmes being the first detective using science as a tool to aid the investigation in the Eighteen's Century as told by Doctor John Watson.¹ He describes in one passage how he found Holmes to have a varied and curious range of knowledge, which includes a profound learning of chemistry including in particular the actions of poisons and a remarkable geological skill which enabled him differentiate soils at a glance.² Holmes had produced a monograph on a hundred and forty kinds of tobacco ash, another on the tracing of foot prints and a third on the influence of trade upon the form of the hand for example on sailors, cork-cutters, composers, weavers and diamond polishers.³

EARLY SCIENTISTS

But the acknowledged foremost work on the subject of science in Police investigation is the published work of Hans Gross (1847 - 1915)⁴ Professor of Criminal Law in the University of Graz, Germany, whose classic book Handbuch Fur Untersuchungs richter was first published in 1893 and the English translation came out in 1907 the book entitled Criminal Investigation⁵ A textbook for magistrates and

Police Officers. In this book he outlines the methods of carrying out investigations and collections of various scientific exhibits which are to be used in criminal cases in courts and how to preserve, pack and deliver to the Laboratory.

The other notable scientist who has greatly contributed in furtherance of science to Police investigation is Dr Edward Locard (1877 - 1966)⁶ of the University of Lyons in France. He was a medical doctor attracted to Police investigation sciences. He started this work in 1910 as a one-room Police Laboratory for the Rhone Precinct and later was enlarged and accepted as a University department. The institute expanded and became the centre of Police Science Investigation College training many students from various European countries in Police science fields. In 1923 he wrote the first volume of his work called Encyclopaedic Traite de Criminalistique.⁷

But in England the progress was slow. It was not until 1935 that it established the Metropolitan Police Laboratory in London as a central crime laboratory to serve the whole country. Meanwhile small regional laboratories were encouraged to be set up in various centres to tackle urgent and simple examinations.⁸

Development in this field in the United States of America was behind that of France and Germany but ahead of

Britain. The Los Angeles Forensic Science Laboratory dates from 1923.⁹ But the Federal Bureau of Investigation Laboratory in Washington D.C., now the biggest and best-known in the country was not started until 1932.¹⁰ It has grown tremendously from one man in a small room with a microscope to a modern scientific complex with over 500 staff members, boasting of a training school and a forensic science research academy to support the work of various states and regional Police crime laboratories in various locations.

FINGERPRINTS

Fingerprint science has received a big part of recognition in Police investigations. Dr N. Grew (1641 - 1712)¹¹ a Botanist and Physician is credited with being the first scientist to record his findings about ridge formations on the fingers.

He published his findings about the skin ridges and pores being intricately arranged in ridge formations in the magazine called Philosophical Transaction of 1684.¹²

Dr John E Purkinje (1787 - 1869) Professor of Anatomy at Breslaw University in Germany wrote a thesis on fingerprint classification by their pattern description.¹³ This was the first attempt to categorise fingerprints by classification.

But it is Sir William J. Herschel (1833 - 1917)¹⁴ Chief British Administrator in Bengal, India from 1853 -

1878 who made practical use of fingerprint in identifying individuals. In 1877, after success use of the methods of fingerprints as means of identification, he submitted a report to the Inspector-General of jails asking permission to extend the practice to prisons. The request was denied. But Herschel persisted in his further studies of fingerprint especially the persistency of ridge characteristics. Unfortunately he did not have any of his works published.

In the matter of identification, Dr Alphonse Bertillon, Chief of the Identification Bureau in Paris devised a personal identification system based on a series of body measurements as a means of classification of identifiable features.¹⁵ The system scored some notable successes in fixing identities and made it creators reputation which bore his name. The only problem was the amount of space required for keeping the files.

It was Sir Francis Galton (1822 -1911)¹⁶ a British Scientist, mathematician and geneticist who wrote about the proof of individuality and persistency of fingerprints. This published work rekindled the government interest, which on 12th February, 1894 appointed a Royal Committee to look into the best way to identify habitual criminals taking into account systems available in United Kingdom and other Countries. It recommended the measurements of body physical features based on Bertillon system and the

identification by fingerprints to be established at Scotland Yard. But by then events were moving fast enough, In Argentina Dr Juan Vucetich, a member of the La Plata Police Force after studying the Galton system first installed fingerprint files as an official means of criminal identification. In 1892, Dr Vucetich, claimed the first official criminal identification by means of fingerprints found at the scene of a crime.

But the greater credit is given to Edward Richard Henry (1859 - 1931)¹⁷ an assistant collector and close colleague of Sir Herschel at Bengal, India. In 1891 he was appointed Inspector-General of Police. During his tenure of office he set out to devise a workable simplified fingerprint classification system. By 1897 he had succeeded. The government of India adopted his identification system and did away with body measurements of Bertillon system. In 1899 with the system well in use in India Henry was invited to read a paper on his system by the British Association for the Advancement of Science at Dover. In 1900 his book Classification and uses of Fingerprints was published at the request of Indian government. In the same year the British Police adopted his fingerprint classification. By 31st May, 1901, Sir Henry was offered a post by the British government and appointed Assistant Commissioner of Police, incharge of Criminal Investigation

Department at Scotland Yard. After this appointment, on 1st July, 1901 he established the fingerprint Branch manned by three officers, namely Detective Inspector Chris Stedman, Detective Sergeant Collins and Detective Constable Frank Hunt. On 13th September 1902 Harry Jackson gained a place in English criminal history.¹⁸ He had been identified by his thumbprint found at burglary scene. He was arrested and tried and Detective Sergeant Collins gave evidence touching on the fingerprint that it had come from Jackson. The jury returned the verdict of guilty and the accused was sentenced to seven years. The basis of identification on fingerprint is that no two single prints have ever been found to be the same, even those which come from identical siamese twins have always shown differences in their fingerprints.

In 1905 fingerprint evidence was given for the first time in the high court in a murder case the Farrow couple were brutally murdered. A cashbox from the scene was examined for fingerprints by Inspector Collins. The thumbprint found on the cashbox was not that of any of the people who could have handled the box legitimately. During police enquiries suspicion centred on two brothers, Alfred and Albert Stratton. When their prints were checked, the thumbprint on the cashbox was found to be identical with the right thumb of Alfred Stratton, the elder of the two brothers. At their trial fingerprint evidence was given by Inspector Collins.

The brothers were found guilty by the evidence from other prosecution sources including fingerprints.¹⁹

FIREARMS AND AMMUNITION

The gun is manufactured for one single purpose and that is to kill. As a result the sight of any firearm in careless hands bring fear and apprehension to the members of the public.

The word "firearm" was coined by the Romans to denote the fire which originated at a man's arm length. This was because the earliest means of discharging a gun which was the flintlock at this time, was the process of holding it in one hand and then hold a source of fire in the other.²⁰ At this time the firearm was defined and understood to mean a tube used with a charge of gun-powder (or like explosive substance) to hurl projectiles. In their earliest forms as true projectile instruments these hurled stones or metal balls or variation of the spears and arrows which were then in use.

The discovery of gun-powder in China which was then introduced in Europe through trade, changed the pattern of wars by introducing the Roman candles, a type of muzzle loading gun whose igniting process was done with a wick connected to powder and sulphur. The wick took long to burn and discharge the loaded gun. The earliest mention of the use of the gun of any kind in England is said to

have been a "pot-de-fer" (pot of fire) during the battle of Greycy.²¹ What in fact, they were using were crudely constructed cannons. After the fifteenth century there were several versions of firearms constructed in various countries on experimental basis. The inventions and improvement on the construction of handguns and shoulder held guns accelerated just before the first world war and such improvements have continued to take place all over the world especially in Europe and continental America.

DEVELOPMENT OF AMMUNITION

After the various uses of powder in discharging a missile or shot or bolt using gun powder as a propellant, the next sought after result, was to find ways and means of incorporating in one component the propellant and the missile. This was the quest for the ammunition. A number of different makes and shapes were tried and experimented on especially in Europe and America. The authoritative recorded first metallic cartridge to be used as one component credit is given to Christian Sharps in 1848.²² The development of center fire cartridge is attributed to a Frenchman Pottet in 1857.²³ In England F.E. Schneider of Paris introduced the metallic center fire ammunition in 1861. The development of ammunition was done in conjunction with the improvements made to the construction of rifles, submachineguns, shotguns, machineguns, pistols and revolves.

FIREARMS EXAMINATION

Science is interested in the firearm as an exhibit in the commission of an offence and the link that may be proved to connect it to an offence or scene of crime. It also equally works to exonerate a particular firearm to have been an author of a particular offence. The interest of a scientist in the exhibits of firearm is mainly in the cartridge case at the scene of a crime, bullets that may be recovered from the body of the victim, powder burns on the body or clothing to estimate the distance of the assailant at the time of shooting, shotgun wads, shells and shots.

The earliest reported case in England is the Gutteridge Case in 1932,²⁴ involving firearm scientific evidence. In this case, Police Constable Gutteridge was shot dead. The Police officers recovered an abandoned motor vehicle which had been used by the murderers, in which they recovered a fired revolver cartridge case. After investigations they were convinced that Brown and Kennedy were the murderers and they found two revolvers in Brown's possession. But the link connecting Brown with the car was still missing. If it could be established that the fired cartridge case found in the car had actually been fired by one of Brown's revolvers, and could not have been fired by any other, this link would be complete. This was the first

occasion on which the task of identifying individual firearm by means of fired cartridge cases or bullets was attempted in England. A group of Army technical small arms experts to whom the case was referred conclusively, with the aid of photographs, proved that the fired cartridge case found in the abandoned car had, beyond any reasonable doubt, been fired by one of Brown's revolvers.

NORTHERN RHODESIA-ZAMBIA

The history of this country in terms of Police operation is entwined into the political development in this region. During the administration of British South Africa Company with the headquarters in South Africa, the need for a big police force was not essential. In 1912 the Northern Rhodesia Police was a military wing of the King's African Rifles whose commander came from the Army.²⁵

In 1924, the British government took over the administration of Northern Rhodesia from the British South Africa Company, and three years later, the government opened the Livingstone Police Training School for Africans.²⁶ In 1933 Northern Rhodesia Police was divorced from existence with the military force.²⁷ By 1951 the Northern Rhodesia Police Force had grown with 250 European officers and inspectors and 1 720 African policemen whose policing assignments were concentrated on the Copperbelt.²⁸ The rest of the rural areas were taken care of by district messengers

attached to the government administration who acted as Police Officers. Kenneth Bradley in his diary of a District Officer, recorded that "perhaps the greatest tribute to these men (messengers) is that for 30 years or more no shot had been fired in anger. In the Northern Province, some one hundred thousand square miles, there is not a single policeman but peace prevails."²⁹

There is nothing much available in the way of documented history as to the availability of scientific aids in the operation of Police Force up to the early fifties. In the late fifties some evidence is available that some elementary scientific sections were introduced in the police, mainly photographic and fingerprint sections. Most other works of science (exhibits) were either sent to Salisbury (Zimbabwe) or to Cape Town for analysis, especially after the creation of the Federation of Rhodesia and Nyasaland. After the break up of the Federation in 1963, some branches of Police Science sections were established and those which had been transferred to the Federal Capital in Salisbury were returned to their own countries. For example all the fingerprint collections which were controlled from Bulawayo on behalf of Northern Rhodesia Police Force were returned in December 1963.³⁰

Documents are not available to shed light as to when some government science departments were established which

have any dealings with Police investigation, including some sections of Police Science sections.

In the case Oliver William Wynne v Crown,³¹ in which the appellant appealed against sentence in the case of murder in which a firearm was used, the court did not have the services of the Forensic Ballistics Expert to testify. The Officer-In-Charge of Luanshya Police Station who testified on his personal knowledge about a pistol in question made number of inaccurate statements concerning the gun and the bullets including the calibre and effect of bullet on the body and a much more serious error was whether the fired bullets and fired cartridge cases were fired from that particular pistol, to which he committed himself.

What is certain is that by 1962 most of the Police Scientific sections of the Laboratory were established and functioning, manned by whites with the support of a small number of African Policemen in junior positions. The beginning of the 1970s brought a realisation and the need to train indigenous Zambians to man the science wings of the Zambia Police and other government agencies.³²

FOOTNOTES

1. Doyle, A.C. - The Complete Sherlock Holmes p.1
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28. Op Cit p.243.
29. Harrap, 1943
30. An interview with Senior Supt B.I. Siita Officer-In-Charge, Fingerprints at Police Headquarters in Lusaka on 20th January, 1989
31. Selected Judgement of Federal Appeal Court for Northern Rhodesia High Court, 1952, cause No. 133/1951
32. The author of this paper was among the three others who trained in U.S.A. in the field of Forensic Ballistics in 1971.

CHAPTER THREE

FORENSIC BALLISTICS EXAMINATION

This chapter will limit itself to the Science of Firearm Identification, sometimes called Forensic Ballistics Examination. The word "Ballistics" is a misnomer which has been perpetrated by the early British Firearms Scientists¹ and it has now stuck with us.

Ballistics in its proper use of the word is divided into interior ballistics which is concerned with what goes on inside the gun such as what causes the bullets to be fired from the gun. Exterior ballistics is concerned with what happens to the bullet after it leaves the barrel, for example, its speed and trajectory. For the benefit of lessening much more confusion, both Forensic Ballistics Examination and Firearms Identification are accepted as meaning the same thing which is the science applied in the examination of firearms, ammunition and fired bullets or cases to try and either connect it with an offence or eliminate the suspect's firearm having anything to do with the crime.² The Police and the courts are interested in much more than just the mechanical, chemical and physical aspects involved in the firing of the gun. What they are really interested in are the answers to the number of questions touching on the firearm; like what the caliber may be, make of the gun, whether revolver, pistol or rifle,

and most important is the question of whether the bullet or cartridge case picked from the scene of the crime was fired from a particular recovered suspected gun.

Before drifting further in the intricacies of terminologies of the gun it is only fair to find the definition of the firearm from a legal point of view. Under the Firearms Act, chapter 111 of the laws of Zambia the firearm is defined under section two as:-

"Any lethal barrelled weapon of any description from which any shot, bullet, bolt or other missile can be discharged or which can be adapted for the discharge of any such shot, bullet, bolt or other missile, includes any weapon designed or adapted for the discharge of any noxious liquid, gas or other thing"

The other section from the same Act, is section 49(5) which makes certain additional understanding of what should be termed firearm under certain circumstances in addition to the main definition under S.2. S.49(5) says:-

"A firearm or imitation firearm shall notwithstanding that it is not loaded or is otherwise incapable of discharging any noxious liquid or gas or any missile, as the case may be, deemed to be an offensive weapon or instrument within the meaning of S.294, 295 and S.305(a) and (b) of the Penal Code Cap 146 "Imitation firearm" means anything which has the appearance of being a firearm, whether or not it is capable of discharging any missile or noxious liquid or gas, as the case may be." section 49 (6)

The interest on the definition of the firearm in both SS.2 and 49 stems from the consequences which result from the commission of the offence under section 294(2) as amended by Act No.2 of Cap 146 by making armed aggravated robbery

with a firearm a capital offence. The Firearms Act came into force on 1st January 1970 and the amendment to the Penal Code was done in 1974. Views on these sections are expressed later in this chapter.

To better understand the subject concerning firearms, it is ideal to know some terminologies in use, for it is not uncommon to hear of loading of the gun with bullets when what is meant is loading it with ammunition or cartridges. Using of correct terminology is so much capitalised on by the lawyers when it comes to their own ball game of legal terminology. In a case³ which the author attended in the subordinate court the police searched a house where a gun was reported to be kept without a licence. The gun was recovered and it was a shotgun made by Remington Company of U.S.A. The Policemen who conducted the search inadvertently mentioned that they recovered a "Greener" shotgun from accused's house. They pointed at the gun and recognised it by its number. The expert disputed the shotgun being a Greener because the maker's name was stamped on it as Remington. Counsel for the defence rose to declare that, we seem to be talking about two guns, one which is not in the court, which the police recovered and my client's gun which is not subject of any charge. The accused was acquitted simply because of this small confusion of makers of this particular shotgun.

DEFINITION OF BASIC TERMS

BARREL - a tube that guides the bullet or projectile or is the interior passage which is grooved in rifles and handguns and smooth in shotguns.

BORE - is the diameter of the barrel, specially used to denote the size in shotguns.

BULLET - Projectile of a pistol or rifle or one of the parts of the cartridge at the top which leaves the barrel when fired.

CARTRIDGE - one unit of ammunition composed of case, primer, powder and bullet, also known as live round of ammunition. This is what is loaded and fired in pistols, pistols, rifles, revolvers-machineguns.

CARTRIDGE CASE - is the case which holds the other three components namely primer, powder and bullet. When a gun is fired the remaining piece of metal which in some guns is ejected is the case. Normally it has a dent at the centre of the base which helps the expert determine whether it was fired from a particular firearm. Sometimes in everyday language known as the shell.

FIRING PIN - part of the action that transmits the blow which ^{to}denotes the primer.

PISTOL - a small handgun which uses a magazine for the storage of ammunition. It's operation is accomplished after the gun is cocked by pulling the slide backwards

and then released to carry the ammunition in the chamber ready to fire, on the pull of the trigger.

REVOLVER - is also a handgun with a revolving cylinder in whose chambers are loaded ammunition. A cartridge is only fired when its chamber is in line with the barrel. The fired cartridge cases from a revolver are removed manually and therefore cartridge cases will not be found at the scene of shooting unless the person shooting had a chance of reloading his gun.

SHOTGUN - is a shoulder held firearm whose inside of the barrel is smooth and fires ammunition loaded with a number of shots.

RIFLE - is also a shoulder-held firearm with a long barrel whose inside has "mountains" (lands) and "valleys" (grooves) termed riflings. These riflings allows the bullet to spin and also imparts these markings on the bullet which are useful for identification under a microscope.

SUBMACHINEGUN - is a shoulder-held or freehand short-barrelled firearm whose operation is automatic like a machinegun but fires the same ammunition size as are fired in pistols. Mainly submachineguns are meant for close quarter combat because the bullets do not go very far when fired on account of the shortness of the barrel and the small charge in the ammunition in terms of powder.

AUTOMATIC/SEMI AUTOMATIC - The operation of the automatic weapon is such that the pressing of the trigger will continuously fire the gun until the magazine is empty or the pressure is released from the trigger. The only true automatics in operation are found in machineguns, some military rifles and submachineguns.

SEMI AUTOMATIC OPERATION - means the weapon is fired once and then it automatically ejects the case and loads a fresh cartridge ready to fire on a fresh pull of the trigger. Therefore there are no true automatics among the pistols they are all semi-automatics.

PRINCIPLES OF FIREARM IDENTIFICATION

The basic examination of the firearm is guided by the sort of answers the investigator or the court wish to get from the expert. Among the basic and most common is to try and find out the condition of the firearm and whether it is in the good working condition and whether it is liable to accidental discharge. This kind of examination becomes crucial if the accused is claiming either a fault in the gun or that the gun went off without any person touching any firing mechanism or claims never to have fired it because it is not in a position to fire. Certain tests are available to check the condition of the gun and it's capability of firing and the easiest is to take the gun and fire it. The claim for the fault in it's

operation may be either true or false and the result can only be known after testing the gun. In 1979 in Chingola, the case of murder was reported against Sergeant Tembo.⁴ The facts were that, a report had been received at the Police Station that fights were taking place in a certain drinking place and therefore management requested police to help maintain order. Tembo and his fellow officers went to the bar. Upon arrival Tembo cocked his shotgun and in trying to apply the safety catch before entering the premises the gun went off and killed the security guard who was waiting at the door. The officer's explanation for the discharge was that the gun went off without touching the firing mechanism and that the gun was faulty. Upon examination of the gun it was found to be very dangerously faulty such that when loaded and cocked, hitting any wooden part with a palm of the hand or hitting it on the floor would make it go off. The case never went any further than the State Chambers, because the shooting in this case was purely accidental and through no fault of the officer.

The other matter of great importance is the question of whether a bullet removed from the body was fired from a particular recovered suspected firearm. This is one examination which is common in the firearms identification and the most helpful in connecting a particular firearm

to have fired a recovered bullet. The system employed is that when the bullet is recovered and also the suspected firearm and delivered to the laboratory, the expert after physical examination takes the same gun and fires some ammunition which would be compared under a microscope with the recovered bullets. If the striations on the exhibit bullets and the twist and number of lands and grooves display the same individual characteristics on the bullets recovered after firing by the expert then it is concluded that both passed through the same barrel of the same gun. In Zambia the court demands that after such an examination the results must be photographed so that the court can observe what the expert is talking about. In the case of Chansa v The People⁵ involving armed aggravated robbery in which a man was injured at a club, the appellant was arrested and tried and convicted. The Ballistics Expert gave evidence that a picked fired cartridge case was in his opinion fired from that very gun. However he did not support his opinion by any test material or photographs.

BARON D.C.J. held that:-

"where there are photographs and other test materials available to be placed before the court, the failure to produce that material is fatal, and then the opinion of the expert should not be accepted."⁶

The identity of bullets is arrived at because of the riflings which impart their marks on the bullets. Riflings

is nothing more than continuous spiralling lines cut into the inside of a barrel. As a bullet travels through the barrel it follows the grooves (riflings) just as a train follows it's track. Since these grooves are spiral, the bullet begins spiralling and in so doing develops a spin. A bullet will not drop down through a barrel of it's own caliber since the barrel has a smaller diameter than the bullet. The bullet will only travel through the barrel if it is being pushed by a tremendous force. The expanding gases, resulting from the burning of the shell powder, provide the necessary force. The reason for having the barrel smaller is to assure that the riflings will affect the bullet by giving it no choice but to follow the riflings as it travels through the barrel. Once it leaves the rifled barrel, the bullet tends to retain this spin.

Because the barrel is smaller than the bullet, the bullet has to be softer than the barrel or else the barrel would explode or cause blockage. Since the barrel is both smaller and harder than the bullet, the barrel imprints it's lands and grooves upon the fired bullet. These are the lands and grooves which provide the identification of a particular firearm having fired a particular bullet.

A question is usually asked whether if two guns, for example two pistols or more are made one after another at the same time from the same machinery, would not have the

Same reflings or lands and grooves on all the bullets or cartridge cases coming from all these pistols.

The answer is that if you get two barrels manufactured one right after the other by the same tools, will produce different scratches upon the first bullet fired through each of them and these will be peculiar to that particular gun only.

An experiment⁷ was carried out at Smith and Wesson Firearms Company, U.S.A. where three pistols were manufactured using the long barrel cut into pistol barrels specification and then fitted to the three pistols and numbered serially. The three pistols were then fired to try and find out whether there was any difference between the three in the markings on their bullets. At the time of comparison the three were able to show minute individual characteristics peculiar only to each individual pistol.

The reason being that even the smoothest appearing metallic surface consists of thousands of miniature "mountains" and "valleys" when this surface comes in contact with a softer metal, the "mountains" scratch the softer metal.⁸ These "mountains" and "valleys" originally are formed during the manufacturing process by the cutting and polishing tools. However, not only is the tool shaping the gun part, but the gun part is wearing away the tool. Also, as the gun is fired, the mountain on the lands and grooves are being worn away and new ones dug

up by it's bullets. Other factors making the change include dirt getting into the barrel and the action of a cleaning rod.

CARTRIDGE CASE IDENTIFICATION

At any shooting, if a cartridge case is picked, it is possible to state the type of firearm used whether it is a pistol, revolver or rifle judging by the shape of the cartridge case construction. The other obvious identification which can be done immediately is the calibre of the weapon used. Under the microscope the features that help in identification include the size and shape of the firing pin impression either at the centre of the case for centre fire ammunition or on the edge for rim fire ammunition.

Other marks which provide identification include the extractor and ejector marks which help the removal of the fired cartridge case from the gun. These two marks are normally absent on cases fired from the revolver because it is emptied manually. At times when the gun is ejecting the spent cartridge case the force that expels the bullet out also pushes the cartridge case forcefully backwards towards the breech block before ejection. This backward banging on the breech block will impart some marks on the base of the case from the breech block. Because the metal of the case is softer than the metal part of the gun and

because of the imperfections in machining the face of the breech, a number of peculiar marks are imparted on the case which will appear on most of other cases fired from the same gun which will help in identification. Therefore the recovery of the fired cartridge case or shotgun shell will help establish the calibre of the gun, the type of the gun which had fired it and later when a person suspected of having been firing is arrested and a particular firearm is found with him which is suspected to have been used, would be examined and either confirm that this particular gun fired or it is not the gun which fired.

OTHER EXAMINATIONS

The controversial question that is often asked in the court to the expert on firearms involve whether the gun has been fired or not and when exactly was it fired?

This question has no precise answer so far as the knowledge stands and a number of researches are still being carried out to find a reasonable answer and conclusion.

The answers so far available are educated guesses. One aspect of the answer is based on the study of the amount of dust and dirt available inside of the barrel. On this basis the expert, can only come to the conclusion that the gun was fired either very recently or sometime ago. Just when sometime ago, can range anywhere from

several weeks to some years.⁹ If the firing is very recent the gun exhibits a cloud of smoke in the barrel which leaves a distinct smell of gun powder combustion which lasts for a very short time.

Another test which is based on the presence of powder particles clinging to the sides of the inside of the barrel is the chemical test to find the presence of nitrate and nitrite both of which are produced in the combustion of propellants. However these tests will only confirm that the firearm has been fired. So far there is no reliable test to tell precisely when a particular firearm was last fired.¹⁰

The French Police Crime Laboratory and the Central Research Establishment Laboratory, Home Office of United Kingdom were given the task of experimenting and determining the time lapse as to the exact time a firearm was last fired using the powder particle residue tests basing it on the presence of nitrates in the barrel, by the Science Section of the International Police. In their separate reports presented at International Police Headquarters in Paris at the Science Conference in 1980,¹¹ the conclusion from both researchers was that as yet there is no definite answer to determine the exact time when the gun was fired.

However, the concentration of research has now

shifted to the Neutron Activation Analysis in trying to determine how long antimony and barium particles which are parts of the primer content will last after firing. The results are encouraging but the research needs a lot of machinery which can only be found in big well established research centres of industry and universities.

Another interesting feature of investigation concerning firearms is the paraffin test or what is called "Dermal Nitrate Test" in which paraffin wax solution is applied to the hands of suspected person who is believed to have recently been firing. The paraffin wax is then tested for the presence of nitrates from gun powder. Unfortunately this test has been discredited because other extrenous factors influence the result. A person who has been handling fertilizer, tobacco, some types of tooth paste will give positive results.¹²

A determination which is of general interest is to ascertain the distance where the gun was fired. This point only becomes relevant when the shooting especially in cases of suicide bordering on the suspicion of murder is involved. It is based on the examination of the powder particles pattern on clothings or on the skin. The principle of this theory is that when a gun is fired at close range the unburnt or partially burnt powder has not yet dissipated and will embed itself in the clothing or around

the entry wound. The increase in distance from the body that a gun is held the greater the absence of powder on the body. Since a person's hand can only hold the gun from his own body at certain distance and certain angle it is presumed that there will be a powder pattern on him and the absence of it is a starting point of disbelieving suicide. When powder pattern is covered with the blood, it can only be seen under ultra violet lamp and photography.

The examination with rare scientific conclusions concerns the muzzle loading gun which is obsolete in the western world but very active in Africa and much more in Zambia.

The process of loading and operation is such that nothing remains when fired to examine except the residue inside the barrel and possibly on the nipple. The shots fired are rarely recovered even where they are recovered they have no scratches which would connect it to a particular muzzle loading gun because the barrel is smooth. The only conclusion normally available to the expert is to state that it has been fired sometime judging by the whitening of the nipple and the inside of the barrel.

SOME FURTHER OBSERVATIONS ON FIREARM

Water seems to have a great effect on the operation of the firearm. Some guns can fire under water but they

are very few. When fired under water the bullet has no sufficient energy to penetrate any skin and therefore no serious injury can result from two people under water where one is armed.¹³ When a gun is fired on the surface of water at a very narrow angle the bullet is capable of bouncing from water with enough energy and velocity capable of killing at a distance from the source especially if the gun is a rifle. But a gun fired while the end of the barrel is touching the surface of water will make the barrel burst because the water acts as an obstruction which creates the build up of the pressure in the barrel.

There is another belief with ammunition, that when it drops on the ground it will explode and the other belief is that ammunition thrown in the fire explodes like a bomb. The truth of the matter, on dropping the ammunition is that nothing happens because there is no hard striking power on the primer. For the ammunition thrown in the fire, the ammunition explodes but not on same level as that of a bomb and when it explodes it can not seriously injure nor cause death because it's movement is not controlled and it has no velocity. If injury results it will come from exploding pieces of the metal.¹⁴ But when the ammunition is kept in bulk in one place and then explodes, the detonation of several ammunition behaves like a big bomb and causes injuries and death from the explosion.

LEGAL INTERPRETATION OF FIREARM CASES

The increase in number of robbery cases in the late 60's and the doubling of same cases in the early 70's¹⁵ led to stiffening of the sentence from the minimum of fifteen years to making it a capital offence in 1974.¹⁶ These are robberies in which firearms are used.

The court's serious view of even possessing a firearm was shown in the case of Wilson Chamoto v The People¹⁷ who was sentenced to four years imprisonment with hard labour for unlawful possession of a firearm (pistol) and ammunition while trespassing at a farm house. It was held that:-

"Having regard to the circumstances prevailing in the country and the ever marked increase in the incidence of the offences involving firearms, the offence is considered to be a serious one and calls for a deterrent punishment."¹⁸

It is cases of armed aggravated robberies which seem to have a lot of attention and discussion and interpretation. In 1977 the court had the task of interpreting the definition of firearm in the case of John Timothy Mwamba and Feston Mwamba v The People.¹⁹ In this case the appellants while armed, stole a considerable amount of goods and used and threatened violence against the owners. Help was summoned while the thieves were in the yard and police killed one of the robbers. First appellant was caught hiding in the grounds of the complainant's house, he lost

his appeal. Third robber escaped but later was found with injuries and some property were found with him allegedly stolen from the house. A firearm similar to that described by the prosecution witnesses was found five days after the robbery at a place a mile away from the complainant's house. There was no evidence that this gun was the one used in the robbery and no effort was made to test it for fingerprints. It was held that:-

- (i) To establish an offence under S.294 (2) (a) of the Penal Code the prosecution must prove that the weapon used was firearm within the meaning of the Firearms Act, Cap 111 i.e. that it was a lethal barrelled weapon from which a shot could be discharged or which could be adapted for the discharge of a shot.
- (ii) The question is not whether any particular gun which is found and is alleged to be connected with the robbery is capable of being fired, but whether the gun seen by the eye - witnesses was so capable. This can be proved by a number of circumstances even if no gun is ever found.²⁰

In this regard the court is guided by section 294 (3) of the Amendment (No.2) Act which states that:-

"In this section "Firearm" has the meaning assigned to it in section 2 of the Firearms Act, Cap 111."

This means that in the matter of capital offence under

section 294(2) the meaning as given in section 49(5) of the Firearms Act as to the meaning of firearm to include imitation firearm does not operate.

But in ordinary aggravated robbery which does not carry a mandatory death sentence imitation firearm is considered a dangerous weapon. In Nkoloma v The People,²¹ aggravated robbery was committed by the appellant using what appeared to be a firearm but which was later certified to be a toy pistol but goods were stolen.

On appeal it was submitted that since it was accepted by the trial court that the threat was with a toy pistol the offence of aggravated robbery was not committed.

BARON D.C.J. held that:--

"(i) where violence is not actually used but is merely threatened the essence of the offence of aggravated robbery is the threat; putting a person in fear by threats, even though the threatener is not in a position to carry them out, is squarely within the the words used by the legislature is S.294(1) of the Penal Code Cap 146.

(ii) furthermore by providing in S.49(5) of the Firearms Act, Cap 111 that a firearm or imitation firearm shall be deemed to be an offensive weapon or instrument within the meaning of, inter alia S.294 the legislature clearly intended that to threaten another with an imitation firearm should come within the definition of aggravated robbery."²²

In 1983 Mr Justice Ngulube D.C.J. made a ruling that when there is an allegation of a firearm having been used in an aggravated robbery case, there must be a clearest of evidence to point towards the presence of a firearm having

been used. This was the observation in the case of Jonas Nkumbwa v The People.²³ In this case the appellant was convicted of armed aggravated robbery on the basis of recent possession and sentenced to death, following a robbery staged by persons in Police and Army uniforms. He was found in possession of the stolen property and an airgun the day after the robbery. He appealed, the honourable Deputy Chief Justice said:-

"There is an allegation that two of the robbers were armed with firearms. There was no direct evidence of the use of firearm as they had not been fired nor were they subsequently found and tested to be firearm within the Firearms Act. They might be imitations. In the premises we find that it would be unsafe to uphold a conviction on a charge of armed aggravated robbery. It follows that the death sentence must be set aside and now impose an appropriate sentence."²⁴

Presently the court has found it desirable that in all cases of armed aggravated robbery all guns must be tested and capable of firing, so that the questions of guns corresponding to the Firearms Act definition is beyond doubt. These sentiments were voiced in case of Edmond Kolulu and Edger Ngoma v The People.²⁵ This was a case of aggravated robbery involving a firearm in which a number of goods were stolen and the thieves received capital punishment. On appeal, one of the arguments advanced was that the expert had testified that the gun was old and badly maintained with some parts missing and that this could not be said that the firearm was one capable of

being fired and the expert did not fire it. It was held that there is no rule of law which requires that a gun in such a case must be fired before evidence can be accepted as to whether or not it was capable of doing its job within the Firearms Act. In this case it is desirable in all cases whenever it is possible that guns should be fired during examination.

The only problem which is in the minds of the public is that not everybody is capable of recognising a true firearm and in most cases it is only after the exhibits have been examined that its true state is known.

FOOTNOTES

1. This is true of most British Firearms Examiners - Major Burrards - The Identification Firearms and Forensic Ballistics (1934)
2. Mathews, J.H. - Identification of Firearms
3. Fernando by then of Chigaga and Company, he had some idea about British and American shotguns which he exploited in this case to show that not all shotguns are greeners.
4. The author tested this particular shotgun and found it dangerously faulty because some parts had been worn out making safety mechanism badly affected.
5. (1975) ZR 136
6. Ibid p.137
7. The author was a party to this experiment in 1971 at New Haven Connecticut. A similar experiment is reported to have been carried on in 1926 - Mathews, J.H., - Firearms Identification Vol.I p.3. Another experiment of interest is the firing of a number of ammunition and pick at random for comparison to check whether they will match. This was carried by Maj-Gen Goddard whose experiment proved conclusive in 1932.
8. Arther, R.O., The Scientific Investigation p.69 - (1972)
9. Ibid p.78
10. Walls, H.J. Forensic Science (1974) p.69
11. Author attended this conference in September, 1980
12. Kirk, P.L. - Crime Investigation (1974) p.97
13. Experiments carried on by the author while under training.
14. Experiments at Fort-Gordon - U.S.A. in which the author participated.
15. Zambia Police Annual Reports 1967 - 84
16. Amendment (No.2) Act of the Penal Code 1974
17. (1980) ZR 20
18. Ibid p.22
19. (1977) ZR 394
20. Ibid p.395
21. (1978) ZR 278
22. Ibid p.279
23. (1983) ZR 103
24. Ibid p.105
25. SCZ/Appeal No.124, 125/85

CHAPTER FOUR

DISCUSSION

The function of an expert witness has been identified as two fold. In the first place the expert has a duty to the court to present evidence as a disinterested witness as accurately as his nature, and as fully as his experience allow. The other equally important function is to feed the investigation officer, as far as possible, with the useful information which allows him to concentrate his limited resources into those avenues of the investigation which appear to him to be the most profitable.

When the expert is giving evidence it is an opinion evidence and it should be given to the court without undue influence on the court to rule in favour of the expert's belief. In the case of Chuba v The people¹ a case of forgery in which the signature of the accused was the main issue in question, the expert said that:-

"the similarities in the specimen handwriting of the appellant and the writing on the disputed :
cheques indicated with a strong degree of certainty that the writer of both was one and the same person. He said that it would be wrong to assume otherwise."²

Mr Justice GARDNER J.S. delivering the judgment held that:-

- (i) The principle is that the opinion of an expert must not be substituted for the judgement of the court. It can only be a guide, albeit a very strong guide, to the court in arriving at its own conclusion on

t the evidence before it.

- (ii) That the evidence of an expert is an opinion only and the matter is one on which the court has to make a finding.³

Some reservations have been expressed in legal circles that since the experts in this country are employed and paid by the executive, whose branch is also incharge of the prosecution then it cannot be ruled out the element of bias. This view holds water in general but has never been proved in court in Zambia in cases involving firearms. Most times the bench has expressed satisfaction about fair testimony from ballistics opinion.⁴

In the book on "How to Cross-Examine a Witness,"⁵ especially on the section dealing with expert witness, Roxley has written thus:-

"Expert witness tend to be biased in favour of the side by which they are called and they show great zeal in endeavouring to substantiate the propositions contended for by that side. Experts as a class, are shrewd and cunning, usually taking pleasure in imparting their knowledge to others while upon the stand, for they have a large share of vanity. If you have to cross-examine them and if you find their testimony is not to be shaken it is better to examine them on a few unimportant matters to show the jury that you are not afraid of them and then sit down."⁶

This is the usual antagonism displayed between the defence counsel and the expert but the question has been asked as to why the mutual animosity? One view which enjoys acceptance is that, it may be that lawyers resent the entry in

to the courtroom of any expert on any subject. Lawyers tend to surround themselves, particularly in court, with a sort of mystique which is accentuated by the traditions, the role, the rituals, legal jargon etc. The lawyer is familiar with these surroundings, they are his natural habitat. The ordinary witness is out of place in such surroundings so the lawyer has an upper hand. But he may feel he does not have the upper hand when dealing with an expert witness, a witness whose knowledge of a particular subject is far greater than his own, particularly if he feels unable to grasp and therefore to test, the evidence being given. The problem is compounded by the fact that he can give evidence, not only of fact, but of opinion. The lawyer may feel uneasy in such a situation. 2. Conversely the expert witness may feel 'Put out' that his firmly held professional opinion should be disbelieved or questioned by some upstart lawyer who knows little if anything, of the subject in question.⁷ Then there is the problem of communication between the two sides and sometimes including the court especially if the expert uses highly technical language then leaves everybody blank and therefore not delivering home his points contained in the evidence.

A number of judgments in different cases especially involving armed aggravated robbery has put a restricted

definition of the firearm especially in capital offences. One difficult that readily comes to mind is the interpretation of section 2 on the definition of a "firearm" especially the proviso under sub section (C) which states that "but does not include an airgun which is not of a type declared by regulations made under this Act to be specially dangerous" But would such an airgun be seriously considered a lethal weapon for the benefit of section 294(2) of the Penal Code? This question is posed because a particular airgun of this description when compared to the other airguns the distinguishing factor is the presence of faint spirals inside the barrel. Because of this difference the specially dangerous airgun has the same meaning as contained under section 2 of the Firearms Act. Firearms Regulation, 31 which came into operation under Statutory Instrument 157 of 1972 declares that:-

"All airguns the barrels of which are rifled are hereby declared to be specially dangerous and accordingly are firearms within the meaning of the Act."

The fact is that an airgun which is rifled can rarely kill when fired even in that state but can maim and cause a sizeable injury on a soft body spot. Additionally, specially dangerous airgun are required to be licenced. So far the only time the author had a chance to find out now the specially dangerous airgun would be interpreted was in the case of The People v Abdul Mwamba and Siulapwa

(1983) un reported. In this case the accused persons robbed a quantity of goods using an airgun at night. This airgun was later certified to be rifled. At the end of trial the court convicted them of the aggravated robbery under section 294 (1) and no reference was made to the airgun being rifled and therefore acquire a different meaning.

According to a brief discussion this author had with the judge,⁸ the bench's view would depend on the circumstances of the case and how the definition of this airgun fits in with the definition of firearm under the Act because of the gravity of the offence involved. It was stated that some meanings must fit in with the practical application of the law. In the understanding of the expert the firearm should consist of a barrel, trigger mechanism and a firing pin to accomplish the controlled detonation and expelling of a missile, shot, or noxious gas.

The current argument about firearms centres on the definition. On one hand it is held that the basic quality of a firearm is the capability of firing. The other school of thought is arguing that a gun does not substantially lose its quality of being a firearm for the simple reason that it requires a bit of attention to make it fire, especially where the person possesses licence to own it and

some slight defect creeps in, it is practically considered still a firearm. The first argument seems to win the day in cases of armed aggravated robbery but the question which still waits to be tested would involve a gun with slight defect being found in the wrong hands, what would be the outcome in the subordinate court? It would be a pity if they insist on every gun be capable of firing before it is regarded as a firearm. There is a need to take a second look at the definition of firearm to seal any room for other interpretations of what should constitute a firearm in different circumstances.

SUMMARY

In this paper I have briefly attempted to trace the connection between science and criminal investigation. How science has been accepted as an independent and disinterested and impartial tool to helping solve some of the problems which are not possible without it. This has been found more pronounced in view of the fact that courts are reluctant to accept confessions from accused persons who are in the custody of the police that they give their statements "freely and voluntarily." Therefore an independent link can only be obtained by the examination of physical exhibits which had been in contact with the accused person which is free of human bias, which can be interpreted through Scientific Examination.

It cannot be denied that society at large has been exposed to how crime scenes are handled and how the exhibits are presented in courts, through newspapers and films including television series therefore society in any country expects its police to do the same. Additionally, the courts through experience and reading precedents have become aware of what to expect from different experts in order to help the courts arrive at a fair judgement and therefore any departure from laid down expectations is considered as failing to perform the investigation to the satisfaction of the court which will raise a doubt. As it is customary, any doubt raised is always in favour of the accused. In this regard science has become synonymous with investigation and contributing to criminal justice.

The history of the development of science to the aid of police work has never been an isolated work. Most main line science branches took to helping the police as a sideline work. The interest and the solutions that science started to offer to solve some crimes and the acceptance of the evidence coming from scientists in the courts of law has helped much in its development especially after the second world war. As science progressed many more fields of application were brought forth and more experiments were put to good use. It is still accepted that some fields of Forensic Sciences are better handled

by Police Scientists whose understanding of the fields are suitable to their own needs

Fingerprints, ballistics, handwritings and photography are still police science areas in Zambia and in many countries.

Forensic Ballistics Examination is one area of science which raises a lot of interest because of the results that normally come out when a gun is fired. It has been recognised that this science together with others has helped in settling particular crimes subscribed to particular firearms in the hands of particular suspects. The controversy on the definition of a firearm when a matter involves cases of capital offence of armed aggravated robbery has raised a number of issues and interpretations. Some personal views are thrown in support and others opposing them. Firearms Science in this paper has simplified matters so that it could be readily understood how the examinations are conducted and how conclusions are reached. This field has been of much help to both police investigators, the court and the accused persons. Cases have come to court where accused persons have admitted to possess firearms, (in ignorance) while what they might have possessed happens to be a toy gun, and the evidence of the expert has served the accused person.

SUGGESTIONS

In view of the stance taken by the courts that guns involved in armed aggravated robbery should be proved capable of firing, there is a need to look again on the other definitions which constitute a firearm in the every day language to marry it to what may be held by the scientist. It is not clear as to what will constitute a gun when it is adapted to fire and what meaning to put on firearms definitions under section 2 nor whether the specially dangerous airgun can qualify, practically, in matters of armed aggravated robbery. My view is that this definition should be looked at and a comprehensive definition be substituted so that some doubts are removed as to what should constitute a firearm not only the possibility of it firing. This view is fortified with the understanding that it is the fear of sight of the gun whether real or imitation including toy guns which operates on the victim to part with his goods.

FOOTNOTES

1.

1. (1976) ZR 272
2. Ibid p.274
3. Ibid p.272
4. Cases have come before the ballistics office where the police have arrested some people with imitation fire-arms or airguns who have in some cases pleaded guilty to unlawful possession of firearm. But when the expert reports that the exhibit in question is not a firearm accused have been either released or acquitted.
5. Roxley, Sir Frederick
6. Ibid p.49 Quoted in J. Forens Sci Soc (1982) 22, 75, p.96
7. J. Forens Sci Soc (1982) 22, 75, - F. FitzSimons - The expert, the Policeman and the Lawyer - An Eternal Triangle p.79
8. The author was a witness in this case. Discussion with Mr Justice C.M. Musumali on 13th May, 1989
9. Op Cit

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