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## ***Editorial***

This 52<sup>nd</sup> volume of The Indian Police Journal for January-March, 2005 includes a variety of articles on subjects like Community Policing, Technology, Forensic Science and Crime Investigation contributed by Senior luminaries in the field of Police, Forensic Scientist, Academicians and Researchers. The issue also contains a number of articles on issues like Police Corruption, Delivery of Police Service, and Community Policing etc., since it concerns both the police and public.

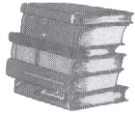
Besides the articles, Book Review of “Manners and Etiquettes” written by Dr. G.P. Bhatnagar and “Nagpur Police Through Ages- A Micro Study in Macro Setting” by Sh. P.L. Joshi, reviewed by Sh. R.C. Arora, Director, BPR&D and Dr. S.B. Bagchi, Principal, CDTs, Kolkata respectively; From the desk of Director (R&D); Technology Update; List of recipients of President’s Police Medals for distinguished Service; and, a list of articles published during 2004 have also been included.

We deeply regret our inability to bring out this issue in time due to some unavoidable/technical problems. Other issues of the journal are also being published soon to clear the backlog.

The present issue has come up with a new cover design with the hope that it will give a better look to the readers of the Journal.

We will be grateful for your comments and valuable suggestions for our future guidance and to enable us to enrich the Journal further.

***EDITOR***



## Abstracts & Key Words

### **Community Policing in Kolkata**

Ms. Tumpa Mukherjee

#### **Key Words :**

Jano Sanjog Sabha, Servant Verification Scheme, Tenant Verification Scheme, Community 'Traffic' Management System.

In Kolkata police & civil society are often at loggerheads with each other. The gory memories of West Bengal State Police crushing the Radical Left Extreme Naxalbari Movement in the late 60's and early 70's haunt the veteran mind. To bridge the yawning gap that prevails among the police and community members, kolkata police is gradually gravitating towards community oriented policing. Kolkata police has advocated and implemented few community policing programs. The thrust is towards promoting client oriented police service where the clients are the community members of the city. The paper further addresses some of the lacunae of the community policing program in Kolkata as well as suggest some workable solutions to make it more effective.

### **Application of Technology in the Prevention of Counterfeiting and Sale of Spurious Products**

Shatrujeet Kapur

#### **Key Words :**

Security printing, Watermark, Fluorescent fibres, Invisible fluorescent ink, Bi-fluorescent ink, Meta merit ink, Thermochromic ink, Optical Variable Ink (OVI), Micro lettering, Radio Frequency Identification (RFID), Dot Matrix Hologram, Electronic Beam (EB) Hologram, Fluorescent galaxy

Wherever there are documents, there is possibility of counterfeiting. The only way to completely prevent this menace is to do away with the documents involved. Although there has been some progress towards paperless working, yet such transactions are only an exception. As a rule, economic transactions involve documents, giving rise to chances of forgery. Another major problem facing the economy is circulation of spurious products. Its global volume exceeds 200 billion dollar per annum causing huge loss to the governments.

How secure a documents is? To answer this question, we will have to look at how secure its ingredients i.e. paper, ink, design, technology, perforation and numbering are. To prevent counterfeiting, we need to carry out a comprehensive review of security features in security documents like

currency notes, government stamps and stamp paper, banking instruments, advance licences etc. Unique composition of paper, ink, design, technology, perforation and add-on features like holograms can go a long way in the prevention of forgeries. It may be a good idea to develop special paper exclusively for security printing. Similarly, certain security inks should be earmarked only for security printing.

Similarly, in order to prevent the sale of spurious products, we need to conceptualize and design a national mark of authentication, on the lines of 'EGMARK', to be used on the labels/packing of genuine products. Concerned industry associations - pharmaceuticals, cosmetics, tobacco products, etc. - may be involved in this initiative with the Government acting as a facilitator.

### **Syllabic Nuclei of Similar Vowel Quality as a Clue for Forensic Speaker Identification -A Study on the Isolated Spoken Words**

C.P. Singh, Manisha K.

#### **Key Words :**

Key Words:- Clue words, onset, Syllabic Nuclei.

In forensic speaker identification practices, the

clue words for spectrographic comparison, which are of same context or dialect, are selected. When the context of the specimen speech materials are different from that of the questioned sample, sufficient clue words are difficult to select out of the speech material provided for spectrographic method of voice comparison which usually leads to no-opinion rather than probable or positive identification even though auditory examination reveals positive matching. Studies have been conducted on the isolated spoken words having similar vowel quality as syllabic nuclei preceded by consonant having same place of articulation for forensic importance as clue words for comparison. Some of the measurable speaker dependent parameters are studied with the selected vowels as /a/, /e/, /i/, /o/ & /u/ uttered by fifteen speakers and found useful for forensic speaker identification, though they are preceded by different consonants having same place of articulation. Thus in a situation where sufficient clue words could not be selected from the speech materials provided, the words/ syllables having vowels of same quality preceded by different consonants having same place of articulation as onset are found to be the only alternative technique of clue word selection for comparison by spectrographic method.

### **Homicide Investigation and Punishment in Ancient India. (From Early Times to 647 A.D)**

Umesh Kumar Singh, I.P.S.,

#### **Key Words :**

Homicide, Primitive Society, Reasons, and Motive of Homicide, Genocide Indus Valley civilization, Vedic Age, The Ramayan and the Mahabharat Age, Dharmashastra, Codification of Indian Law, Kautilyan Arthashastra, Prostitutes, Harlots, Human Sacrifice, Brahmanicide, Sati system, Infanticide, Feticide, Investigation, Postmortem, Punishment, Capital Punishment, Seditious Minister, Unjust, Feudal, Toiling.

This article is of immense academic interest and it is an attempt to present a picture of homicidal incidents in the remote past of Indian society. Society, in the past also, was not free from incidents of crime and the then State machinery had devised a very successful methodology to prevent, detect and control such re-occurrence of criminal incidents. Though police administration or criminal dispensation justice system of modern type did not exist so full fledgedly, yet the then government have devised very effective methods to catch the criminals, put them under trial and to ensure the deterrent punishment to the

real culprits. Due care was taken to ensure that innocent must be allowed protection and be left out without any punishment but utmost care was taken to a sure short I punishment to the guilty. Treatment of State government and other public servant to the people of the state was not equal and uniformed and for the same offence culprits of different castes were differently treated and unequally punished. Brahmins enjoyed the great privilege and were having less punishment, and next to them Kshatriyas were treated with higher esteem and the rest two castes- Vaishyas and the Sudras were punished with all cruelty and tortures. Privileged few enjoyed all the privileges and the common people and masses were ' maitre acted and punished with all severity. Females and Sudras were treated worst than the animals.

### **Are West Bengal Police Officers Stressed?**

Dr. Sibnath Deb, Tanusree Chakraborty, Pooja Chatterjee and Dr. Neerajakshi Srivastava.

#### **Key Words :**

Police Officer, Stress, Symptoms of Stress, Consequences of Stress, Role Over-Load, Role Ambiguity, Role Conflict, Group And Political Pressures, Responsibility For Persons, Under Participation,

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Powerlessness, Poor Peer Relations, Intrinsic Impoverishment, Low Status, Strenuous Working Conditions, And Unprofitability.

Police Officers play a significant role for maintaining law and order in the society. Sometimes they work under pressure and are stressed. The broad objective of the present study was to understand the level of psychological stress among West Bengal Police Officers. A group of 50 Senior Police Officers with at least 5 years working experience was covered and data were collected by using 'Occupational Stress Index' developed by Dr. A.K. Srivastava and Dr. A.P. Singh (1998) through self-administration method. Findings revealed that 14.0% of the Police Officers were suffering from high psychological stress. Further analysis of data revealed that the main areas of stress included un-profitability (22.0%), role overload (18.0%), role conflict (18.0%), powerlessness (18.0%), role ambiguity (16.0%), unreasonable group and political pressure (16.0%), intrinsic impoverishment (16.0%) and under participation (16.0%). Findings suggest that special attention is required for taking need-based measures for each of the above areas of stress for unburdening the level of stress among Police Officers.

### **Taming The Beast: Can Corruption Be Controlled?**

Jayanto N. Choudhury, IPS

#### **Key Words :**

Corruption in India - 2% of GDP - CVC - CBI - CVOs - ACBs - Laws - hotspots - public - police corruption

Corruption reduces India's growth by 3-5% annually. The highest institutions have condemned corruption, yet graft seems to be uncontrollable. This article reviews the architecture and laws to address corruption. It then calls for a coherent strategy, restructured organization and review of instruments. Constructing a Richter's scale of sleaze and focusing on 'hotspots' would make more effective use of limited resources. Consolidating and strengthening the CVO would yield better dividends. Enlisting the public and strengthening anti-corruption capabilities in the states are the keys to better results. Police corruption must be reduced to improve the governments image. Leadership, Training and Oversight are suggested means to achieve this. The feasible goal is to change the perception that corruption is low-risk and that anyone who isn't corrupt lacks either 'the opportunity or the guts'.

### **National Ballistics Imaging Database Management and its Applications in Indian Perspective**

S.S. Baisoya

#### **Key Words :**

Integrated Ballistics Identification System, Firearms Examination, Ballistics Imaging Database, Correlation of Images, Image Analysis Techniques.

Firearms related crimes are increasing due to the use of firearms in the activities of terrorists, naxalites, interstate criminals, serial killers, and repeat offenders in the country. Criminals generally commit several crimes in different jurisdictions after unknown spans of time usually with the same firearm. These crimes are investigated by investigating agencies of the respective areas in an isolated manner due to lack of any clue between them. Many of these crimes remained unsolved and unlinked for an indefinite period. In addition, the increase in casework leads to overburdening the Forensic Science Laboratories in the country. This poses problems in effective examination and comparison of huge amount of exhibits with the traditional manual technique using comparison microscope. Further, as casework increases in the laboratories, there are less likely chances that two separate crimes committed by same firearm would be connected. CFSL Chandigarh, therefore, have taken an initiative and established facility of automatic examination and comparison of

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images of markings on fired bullets/cartridge cases using Integrated Ballistics Identification System. This is an automated system capable of image acquisition, signature extraction and correlation of images. Using this system, the laboratory is creating national ballistics imaging database of the images of markings on firearm evidences. As new images are entered, the system searches the existing database and comparisons are made for possible matches. Thus, the database will help in linking the previously unlinkable crimes committed with the same firearm in different jurisdictions. The present paper explains the various features of the national ballistics imaging database and its forensic applications in the Indian perspective.

**Perceptions of Police Personnel about their Customer Orientation towards Women**

B. Sandhya IPS\*

**Key Words :**

Customer Orientation, Service Delivery, Perception, Grass Root Level, Cutting Edge Level, Middle Level, Women Customers, Crime Against Women (CAW)

Customer Orientation towards the down trodden and needy sections of the society is the basic requirement if the police service need gain an image of a Service-Oriented Organisation. Women in India can be considered as a needy section of the society. In the present study, perception of police personnel about their own Customer Orientation towards women was measured, as

‘mental models’ created by individuals about organization affect the way in which they react to situations and orient themselves. The result shows that Grass Root Level personnel (Constabulary) paint the Department in brighter colours on Customer Orientation towards women, than the Middle Level and Cutting Edge Level personnel. Better interpersonal relations help to develop better perceptions. Police personnel themselves do not feel fully confident that they themselves would get a fair deal from a Police Station in a CAW case. Even then they do not perceive the urgency for further change in Customer Orientation and developing gender sensitivity. The study points towards need for the top management to give top priority to Customer Orientation towards women.

# Community Policing in Kolkata

Ms. Tumpa Mukherjee \*

## Introduction:

In Kolkata, Police and Civil Society are often at loggerheads with each other. The gory memories of West Bengal State Police crushing the Radical Left Extreme Naxalbari movement in the late 60's and early 70's haunt the veteran mind. In recent years the hiatus between the police and the community started escalating and a necessity to bridge the yawning gap between police and community members were ardently required. The need of the hour is to follow the healing touch of Community Policing. Kolkata Police has launched myriads of community policing schemes like Jano Sanjog Sabha, Nabadisha, and Probaha, Friendship Cup Tournament.

## Jano Sano Sabha

The aftermath of September 11 attack on World Trade Center or back home in Kolkata the American Center attack in January 2002 has time and again revealed that criminals have a tendency to hide themselves by living with common people. Hence it is necessary to establish mutual understanding between the police and the community members. As a result Kolkata Police has crafted a scheme named Jano San jog Sabha,. As the name suggests these are meetings organized by the police in all police stations with the assistance from the local residents. It constitutes a forum where community members and police

## Key Words :

*Jano Sanjog Sabha, Servant Verification Scheme, Tenant Verification Scheme, Community 'Traffic' Management System.*

## Abstract :

*In Kolkata police & civil society are often at loggerheads with each other. The gory memories of West Bengal State Police crushing the Radical Left Extreme Naxalbari Movement in the late 60's and early 70's haunt the veteran mind. To bridge the yawning gap that prevails among the police and community members, kolkata police is gradually gravitating towards community oriented policing. Kolkata police has advocated and implemented few community policing programs. The thrust is towards promoting client oriented police service where the clients are the community members of the city. The paper further addresses some of the lacunae of the community policing program in Kolkata as well as suggest some workable solutions to make it more effective.*

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discuss local problems, local residents can air their views. Such sabhas or meetings are attended by beat officers (who may be a sub inspector, assistant sub-inspector of the local police station). There exists a Thana Level Advisory Committee comprising of local doctors, lawyers, teacher's, MLA's etc who offer their valuable suggestions, views to the officer-in-charge of the local police station. The discussion ranges from civic problems like property disputes local population has to confront to marital disputes, domestic violence and are informal in nature but purposeful, free, frank. In these Sabhas police officers perform the role of counselors, mediator, arbitrator. Preventive Crime Awareness measures are often discussed in these meetings. Just before last year's (2003) Durga Puja festival, Jano Sanjog Sabha was organized at kalighat Police station. In this Sabha some community members requested the local police authorities to increase police patrolling in and around Tolly Nullah. They informed the police to prohibit selling of liquor near the Tolly Nullah at least during the festival days. Issues like how to prevent eve teasing was discussed.

Many civic problems are discussed and meted out in these sabhas. For example the issue of local swimming club having no electricity connection was stated by a local resident in a Jano Sanjog Sabha. Taking advantage, the club was used for anti-social activities by local hoodlums. The police personnel as well as the local residents appealed to CESC. In due course of time arrangements for electricity was made. These are practical implementation of 'Fixing Broken Window theory'.

In many areas jurisdictioned under Watgunge Police station police personnel meet the Principal and the students of local schools. Police personnel interact with students and discuss issues of practical policing. The beat officers organize meetings with cyber cafe owners to discuss issues like cyber crime, cyber laws. Such interaction creates awareness among the cyber cafe owners as well as it helps to establish link with the community members. Though Servant Verification scheme and Tenant Verification scheme exist however some community members do not willingly co-operate with police officers in these matters.

Such frequent community police interface has helped to wane out considerably the fear of police from the minds of the community members, thereby paving the path of mutual understanding between the two sections of society who often are at loggerheads with each other.

Since in most of the police station no documentation takes place, these are all approximate figures derived from interaction with the Officer-in Charge of respective police station between the period May – October 2003.

On the basis of surveying 9 police stations a generalized conclusion cannot be reached.

However, the present data reveals a negligible percentage of population (the general mass) participating in Jano Sanjog Sabha.

### **Nabadisha**

Nabadisha is a program for street children launched by Kolkata Police in collaboration with Rotary International



**The following information is received after surveying 9 Police Stations**

Name of the division	Name of the Police Station	Population in(lakhs) held (approx)	No. of Jano Sanjog Sabha (approx)	No. of people participated	% of participation
North & North Suburban	Burtolla	6	5	45	.038
East Suburban	Manicktola	9	20	15	0.33
Central	Grish Park Taltala	1.25	10	50	0.4
		2	10	55	.28
South	Kalighat Charu Market Bhownipore Tollygunge	2.5	5	100	0.2
		1.5	12	65	0.52
		5	10	75	0.15
		2	20	65	0.52
Port	Watgunge	3.5	8	275	0.69

and Lions club. In each police station free monthly health checkup Camps for street children are organized. They are provided with free medicines and nutritional supplement. More than 6000 children are registered with different police stations. To restrict and prevent the growth of delinquent traits found among children living in certain slum zones of Kolkata, Kolkata Police in collaboration with NGOs like Child Relief and You (CRY), Vikramshila Educational Resource Society, Woman's Interlink Foundation has devised a program of providing education to the street children. In these schools children are classified into Non –Formal students (who have never attended schools), Remedial students, (those who are enrolled in local school.) The Non-Formal students receive pre primary level education while the Formal

students receive support from the teachers to complete their homework and are prepared for final exams.

### **Probaha**

This is a year long blood donation camp launched by Kolkata police in collaboration with the help of Central Blood Bank & Lions Club. The first blood donation camp was held at Drill Hall inside Lal Bazaar (Kolkata Police Head Quarter) Campus. Henceforth it is held within the Kolkata Police jurisdictions. On each Saturday one Police unit of Kolkata organizes a blood donation camp where policemen as well as local residents donate blood voluntarily. Apart from the local police station, blood donation camp takes place at Traffic Police Guard's Office, Police Housing Estate Complex, Police Training School. The Central blood Bank (Health

Department, Government of West Bengal) issues identity cards to the donors which are collected by the office of the Special Additional Commissioner of Police (Organization), then it is distributed to the local police station. It remains in the police station to help the local mass when in distress. Those who are in distress approach the local police station with the requisitions from the hospital, collect the identity card & get

the blood from the blood bank. By this blood donation camp Kolkata Police not only helps the people in distress but also informal healthy relationship with the general population is established, paving the path for an effective Police – Community Relations.

These are approximate figures derived from interacting with the Officer-in –Charge of respective police station between the period May –Oct 2003.

Name of the Division	Name of the police station.	Total population (lakhs) approx.	No. of people donated blood (approx)	% of people donated blood
North & North Suburban	Burtolla	6	100	.017
East Suburban	Manicktola	9	Not yet held	
Central	Girish Park	1.25	41	.039
	Taltala	2	72	.036
South	Tollugunge	2	100	.05
	Charu Market	1.5	100	.067
Port	Wat gunge	3.5	100	0.29

Though a generalized conclusion cannot be reached by surveying 9 police stations, yet the data reveals a very negligible portion of the population participating in blood donation camp. One probable reason for such low participation is that community members often donate blood at blood donation camps organized by local clubs as a result they hesitate to donate blood frequently.

### **Friendship Cup**

The National Police Commission in its fifth report (paragraph 41.4) had highlighted the fact that the police have a long tradition of organizing games and participating in tournaments. Following the notable recommendations of National Police Commission each year

Kolkata Police organizes football tournaments. In 1997 Friendship Cup Football Tournament was launched. These socio cultural sport activities are meant to divert the attention of the youth from delinquent activities, deviant behavior. Such events have helped to create atmosphere of trust between police & youths of Calcutta. It has helped to reduce fear from the minds of the youth. Thus a constant endeavor is made to improve the relationship between Kolkata police & the community members.

### **Kolkata Police & Women Grievance Cell**

On 2<sup>nd</sup> December 1998 Detective Department Of Kolkata Police had

launched the Women's Grievance Cell, which deals with atrocities committed upon women ranging from the domestic violence to violence at workplace within Kolkata. The work periphery of the Officer-in-Charge of Women's Grievance Cell ranges from the investigation of cases (of Violence against women) to counseling. These officers receive special training from Legal Aid Services, West Bengal. Most important aspect of the work of the officers as well as Psychologists attached to Women Grievance Cell is to listen to the problem of women in distress and try to understand her perspective as well as that of her parents, relative, husband and in-laws. Then family counseling takes place. The cases dealt here are related to 498 (A) IPC, 304B(IPC), 375IPC, 376IPC & 406 IPC.

### **Kolkata Police and Community Traffic Management**

To augment dissemination of information related to traffic conditions in the city, Kolkata Police have adopted the following measures: In September 2002 Kolkata Police launched one of the most informative web site (i.e. [www.Kolkatatrafficpolice.org](http://www.Kolkatatrafficpolice.org)) on matters related to traffic policing in Kolkata. Interactive Voice Responding Systems (IVRS) is a system by which people can obtain Traffic updates from the Traffic Computer cell by dialing 2214 3185. Updates of traffic condition of the city are provided by F.M Radio and 'Khabor Ekhon' channel everyday. The Traffic Training School organizes various awareness programs on road safety. Every Year Kolkata Traffic Police organizes Road Safety Week during the month of January. During the Road Safety Week NGOs and school children

extend their helping hands to the Kolkata Traffic Police for the management of traffic in the city. In order to foster better Traffic sense and also to inculcate safety awareness on roads, Traffic Training School, Kolkata organizes Inter School Road Safety Game, Signal Drill, March Past Competition every year at the Children's Traffic Training Park, Park Circus Maidan. From 1997 Traffic Education has become a part of Physical Education subject in the Madhyamik Curriculum. The earmarked police officers, including lady officers of Traffic Training School, impart traffic education in different schools of West Bengal Board.

The traffic wing of Kolkata Police have made an endeavor to seek suggestions from some distinguished Calcuttan's regarding traffic management in the city. The City Police area comprising of 11 traffic guards were divided into 5 broad zones and about 5 citizens from each zone were invited for their suggestions. Some of them suggested workable solutions like replacing dull navy blue sweaters by some bright fluorescent color which helps to spot a traffic policeman while driving in the dark winter day.

### **Drug De addiction Awareness Program**

Drug is the greatest menace that the present generations is facing today. But Kolkata police is firmly committed to keep the city free of drugs. A large no of voluntary agencies have joined hands with Kolkata Police and have launched awareness program, which comprises of seminars, synopsis, debates, sit & draw competition on anti drug themes for school children. Local residents are

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made aware of the negative effect of consuming drugs and how addictions to the drugs have destroyed life, individual & society. However there are some 'grey' areas of Community Policing programs in Kolkata, which require attention & instant remedy. Firstly, in most of the police stations no formal documentation of the Jano Sanjog Sabha takes place. Secondly, there exist a dearth in the availability of resources both human & non human resource (material resources) which acts as stumbling block in the implementation of the community policing schemes. The beat officers remain so busy in their investigation work that they do not have surplus time to conduct routine home visits or implement community policing activities. Thirdly at its present condition community policing in Kolkata is the fruit of individual endeavor of some police personnel. Such community policing experiments may come to a halt with the change in the leadership or with the transfer of police officers. Frequent transfer of the police officers is detrimental in the implementation of community policing activities. Fourthly, local political interference in the day-to-day activities of police work acts as an impediment in the implementation of community policing programs. Fifthly voluntary participation in community policing programs is very less from the middle class strata of our population. Some community members try to extend their helping hands to the police, thereby trying to serve their own vested interests. Though schemes like Servant Verification, Tenant Verification exist, however often community members do not willingly participate in such schemes. Sixthly, Community policing schemes implemented have not been

communicated to the apolitical common mass in a holistic manner. As a result often the general mass are ignorant of such schemes adopted.

### **Some Suggestions**

- 1) **Complaint and Suggestion Boxes** may be introduced in every police station. Local mass of population especially the vulnerable section of the society can express their complaints, grievances, by maintaining anonymity.
- 2) **Neighborhood Groups** in form of 'Resistance groups' (as followed in the district of Nadia) may be introduced in Kolkata. The local volunteers may collaborate with police personnel and engage themselves in patrolling the local neighborhood area at night. However, this has an 'impending danger'. In the present social scenario these local volunteers often are representatives of local political party. Hence they may often try to manipulate 'police' personnel for serving their own vested interests.
- 3) **Changes in Educational Syllabus** – Successful implementation of community policing experiments require an infrastructure, which to a large extent is not available. A high level of civic sense contributes to scheme success. In the present social political scenario there has been an erosion of civic sense, moral and ethical values. It is necessary to rejuvenate the educational system of the state. Chapters on 'Police

Administration', policing should be included in the school syllabus. At the college and University level Criminal Justice System and its operation should be taught. Social Science departments of Universities should set up Research Institutes where issues on different aspects of police and policing like community policing, psycho-logical stresses suffered by the police personnel may be intensively probed and researched. A joint effort of social scientist and police personnel may pave the path towards an arduous journey of a crime-free society.

- 4) **Retired Police Officers may form Consultative Groups.** They could share their 'real' life experiences of policing with the common mass. They may use the media to highlight the pros and cons of policing, problems encountered as well as to unfurl the hitherto unknown aspects of police & policing. The retired police officers consultative group, if formed, may advise local citizens on matters related to civic issues, on law enforcement.
- 5) **Citizen Opinion Forum** – Local surveys may be conducted after every 6 months which would reveal the opinion of local population on police, policing. It will highlight the limitations of local policing requiring improvements, which may be taken due attention. It is necessary that community policing programs implemented should be monitored and evaluated.

Longitudinal assessment surveys of the schemes adopted may be conducted. A comprehensive public relation endeavor should be initiated to promote the plan through media both print and electronic. The media should be used positively to bridge the yawning gap between the police and the community.

- 6) **Institutionalizing Community Policing programs** – even though institutionalization has some negative consequences, yet it is necessary to institutionalize the schemes & programs (at least tie up with some social welfare departments) which will ensure the implementation of such community policing schemes even when political and departmental leaders change.

### Conclusion

In this globalized world it is increasingly being realized that Interpol as well as the Paramilitary Forces are unable to single handedly maintain peace and order in the society. Hence local policing by civil police personnel is gaining dominance in the maintenance of internal security. However community policing should be advocated as a complementary strategy with other aspects of policing.

### Notes & References:

1. Kolkata Traffic Police, Review for the year 2002
2. 'Metro' The Telegraph, Calcutta. Monday. 2 February 2004

# Application of Technology in the Prevention of Counterfeiting and Sale of Spurious Products

Shatrujeet Kapur \*

## Introduction

Millions of financial transactions take place every day in our economy namely, sales, purchases, lendings, borrowings, imports, exports, acquisitions, etc. They are all varied in nature, yet there is one commonality - almost all of them involve documents. For example, cheques, demand drafts, pay orders, LCs, sale/purchase agreements, loan agreements, lease deeds, etc. invoices, purchase orders, etc. Activities like education, health, tourism etc. also involve large number of documents, namely, University degrees, medical certificates, passports, visas, Traveller cheques, etc.

Wherever there are documents, there is possibility of counterfeiting. Examples are fake university degrees, forged passports, fake visas, forged demand drafts, fake stamps, counterfeit currency, etc. The only way to completely prevent the menace of counterfeiting is to do away with the documents involved. But that would require introduction of paperless working. With the advent of modern technology, there has been some

## Key Words :

*Security printing, Watermark, Fluorescent fibres, Invisible fluorescent ink, Bi-fluorescent ink, Meta merit ink, Thermochromic ink, Optical Variable Ink (OVI), Micro lettering, Radio Frequency Identification (RFID), Dot Matrix Hologram, Electronic Beam (EB) Hologram, Fluorescent galaxy*

## Abstract :

*Wherever there are documents, there is possibility of counterfeiting. The only way to completely prevent this menace is to do away with the documents involved. Although there has been some progress towards paperless working, yet such transactions are only an exception. As a rule, economic transactions involve documents, giving rise to chances of forgery. Another major problem facing the economy is circulation of spurious products. Its global volume exceeds 200 billion dollar per annum causing huge loss to the governments.*

*How secure a documents is? To answer this question, we will have to look at how secure its ingredients i.e. paper, ink, design, technology, perforation and numbering are. To prevent counterfeiting, we need to carry out a comprehensive review of security features in security documents like currency notes, government stamps and stamp paper, banking instruments, advance licences etc. Unique composition of paper, ink, design, technology, perforation and add-on features like holograms can go a long way in the prevention of forgeries. It may be a good idea to develop special paper exclusively for security printing. Similarly, certain security inks should be earmarked only for security printing.*

*Similarly, in order to prevent the sale of spurious products, we need to conceptualize and design a national mark of authentication, on the lines of 'EGMARK', to be used on the labels/packing of genuine products. Concerned industry associations - pharmaceuticals, cosmetics, tobacco products, etc. - may be involved in this initiative with the Government acting as a facilitator.*

*\*DIG of Police, (Trg.)*

*CBI Academy,  
Ghaziabad*

movement towards paperless working e.g. DEMATerialisation of shares, payments by credit cards, use of ATM's etc. Yet this is limited only to a minuscule percentage of transactions in the economy.

Another problem facing the global economy is the circulation of spurious products viz. spurious drugs, cosmetics, tobacco products, alcohol, auto parts etc. To sell the spurious products, fake labels of popular brands are forged. Thus, counterfeiting has become a big global business. As per a rough estimate, its volume exceeds 200 billion dollars per annum. Fiscal loss caused to governments alone runs into billions of dollars.

One may argue that selling spurious cosmetics and counterfeiting currency notes are two distinct offences and different strategies are needed to tackle them. This is not entirely true because, as explained above, every financial transaction involves documents. Documents, in turn, are produced through the process of printing. Printing involves technology. Therefore, no forgery can be committed without the use of technology. The reverse of this statement is also true i.e. technology can also be used to prevent counterfeiting and forgery.

The objective of this study is to see how this can be done.

## Part II : Security Printing

Modern technology can play a crucial role in enhancing the security features in a document and thereby minimizing the possibility of forgery. In order to understand this, we need to take a look on the following aspects of security in printing:-

- A. Security in paper
- B. Security in ink.
- C. Security in Design
- D. Security in numbering
- E. Security in printing technology
- F. Security in perforation
- G. Electronic Security features
- H. Add-on security features

### A Security in Paper

Paper is the most important ingredient of any document. Its physical and chemical properties decide the texture, feel and life of a document. The following features/characteristics of paper can be used to impart an element of uniqueness and to prevent counterfeiting of documents :-

1. **Watermark:-** Watermark is the commonest security feature built into paper. It is basically a figure, word, logo or a portrait that is incorporated in paper at the pulp stage itself. It is visible against light from both sides. Dandy rolls are used to incorporate watermark in paper. The design of the watermark is made of wire and is affixed to the dandy roll. As the web passes underneath, the fibres are both displaced and compressed, leaving the watermark clearly visible in the sheet.
2. **Weight:-** Weight of paper in grams per square meter (GSM) is another important para-meter. Paper having specified GSM value is used in security printing. For example, MICR cheque paper is 96 GSM. In fact, certain GSM values need to be

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- reserved for security printing and supply of such paper from different paper mills can be regulated. This would be on the lines of radio frequencies where some frequencies are reserved only for police/military use.
3. **Shade:-** Use of colour paper, instead of plain white paper, can be a good deterrent against counterfeiting. Like GSM value, the shade of security paper can also be specified in terms of its  $L^*a^*b$  value. Pantone Matching System (PMS) is a method universally accepted for specifying colours. Using this technique, any of more than 500 hues can be selected from a "swatch book". The desired colour is then obtained by using the swatch number and referring to a formula guide. This guide indicates the basic colours involved and how much of each to mix in order to arrive at the desired shade.
  4. **Paper composition:-** A sheet of paper consists chiefly of interwoven cellulose fibres which are extracted from wood and other vegetable matter. The main raw materials from which the fibres are obtained, are wood pulp, recycled waste paper and board, rags etc. A high rag content in paper enhances its durability and strength. 100% rag content paper is produced in the country only in Security Paper Mill, Hoshangabad. It has very long life. Some private paper mills also produce paper upto 25% rag content.
  5. **Chemical sensitivity:-** The composition of paper can be fixed giving it a distinct feel and look. Chemically sensitive paper means paper that is sensitive to certain varieties of chemicals. If such paper is tampered with these chemicals, its colour changes. Therefore, if security paper is made sensitive to chemicals commonly used for counterfeiting, it will make the job of forgers more difficult.
  6. **Gumming:-** Gumming is used in all adhesive stamps, namely, postal stamps, revenue stamps, fiscal stamps etc. Unique features of gumming can be used to add to the security features of security documents. For example, fluorescent substance can be added to the gum, that glows under Ultra Violet light. The grammage of gumming is also an important parameter and it is specified in case of security items.
  7. **Fluorescent fibers:-** Fibres, invisible to the naked eye, having fixed specifications, can be incorporated into paper at the stage of manufacturing. These fibers glow under UV light. The least count of i.e. number of fibers per square centimeter, can be specified.
  8. **Security Thread:-** This is one of the most commonly known security features, courtesy currency notes. It is also very effective. Its present



variant namely, holographic security thread with stitched type formation, is being used in high denomination currency notes in the country and is very difficult to counterfeit.

The above mentioned features/ characteristics can be prescribed to define a few limited types of security paper in the country, with permission to only select paper mills to manufacture such papers. An effective system for the regulation of production and supply of this paper can go a long way in curbing counterfeiting.

## B. Security in Ink

Next to paper, ink is the most important ingredient in printing. Ink consists mainly of a pigment and vehicle. The pigment gives the colour and is dispersed into the vehicle or varnish, which serves as the medium for carrying the pigment and subsequently for binding it to the surface. In addition to the pigment and the vehicle, additives are also an important ingredient of ink.

Several types of inks are now available which can be used to enhance the security features in valuable securities for example:-

1. **Fugitive ink** - Most commonly used for printing of security documents in the country. This ink is water soluble.
2. **Invisible fluorescent ink** - This ink is invisible in normal light but glows under UV light.
3. **Bi-fluorescent ink** - This ink has one shade under normal light and another under UV light.

4. **Meta merit inks** - This ink becomes invisible when seen under red filter.

5. **Thermochromic inks** - This ink becomes invisible at certain temperatures. This temperature can be set from 40 to 60°C.

6. **Optical Variable Inks** - Shade of this ink changes when the sheet is tilted at certain angles. It is used in Intaglio or silk screen printing.

Inks at Sr.No.2 to 6 above cannot be reproduced in colour photocopying process. Hence, they can be effectively used to prevent counterfeiting by colour photocopy.

## C. Security in Design

Several technical parameters can be varied in the design of printing in order to make forgery difficult, namely,

- Multi colour printing can be used. 8 to 14 colour printing is now possible.
- Micro lettering, micro inscriptions etc. can be incorporated in body design.
- Anti-photocopying features can be incorporated
- Number of lines per mm may be increased

## D. Security in Numbering

A meaningful number on a security document, say cheque, can contain lot of information like bank code, branch code, year code, type of document, check digit etc. Besides, type of font used for numbering, font size, type of ink etc. can be varied to prevent counterfeiting.

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## **E. Security Through Selection of Printing Technology**

In order to avoid detection, the forgers always try to use the same technology as is used in original documents. Therefore, choice of a unique technology can frustrate their designs. In addition, choice of a capital-intensive technology, involving high investments, also minimises the possibility of easy availability of technology.

Lithography, letterpress, flexography, gravure and screen printing are major conventional printing processes. Each of these processes has its own features. By examining a document, it is possible to identify the technology used to print it. For example, Intaglio printing gives a relief effect to the printed portion. It is effectively used world over in the printing of currency notes because of its exclusive nature. This is because Intaglio printing equipments are produced only by two manufactures in the world, namely, KBA - Giori of Switzerland and Kamori of Japan. These manufacturers sell their equipment only to official agencies. They also maintain record of each sale. Moreover, this technology is highly capital - intensive (costing more than 20 crores per machine) and very inefficient (it consumes three times more ink than other processes), rendering it costlier and out of reach for ordinary forgers.

## **F. Security by Perforation**

Perforation is a process used to make holes of specified diameter and shape (round, oval, star, conical etc.) on a surface. With the help of modern technology, perforation can be done in any shape. As unique shapes are

difficult to replicate, the process of perforation can be effectively used to curb forgeries.

With the advent of laser technology, the variety in perforation has increased manifold. Besides, additional security features like conical perforation and micro perforation are also possible as explained below:-

**Conical Perforation** - This process is used in perforating booklets or sheets of paper e.g. passports. The diameter of the perforation reduces gradually from top sheet to the bottom sheet.

**Micro Perforation** - Using laser technology, micro holes having diameter of 1.5 microns to 3 microns, are made in the body of a printed document. These holes can be of any desired shape. These holes are normally not visible but can be seen against light. Such minute holes cannot be made using any mechanical means. This makes micro perforation an effective tool against counterfeiting. Micro perforation is a good anti-copying feature also.

## **G. Electronic Security Features**

Examples are :-

1. **Barcoding** - Barcodes are a set of black vertical bars with a series of numbers which are printed on a document. It contains coded information e.g. product name, cost, specifications etc. This information can be read with the help of a barcode-reader.

2. **Radio Frequency Identification (RFID)** - RFID is Radio Frequency Identification, a technology that uses radio waves to identify people or objects. This is an emerging

technology and is gaining ground in developed countries in place of barcoding.

The system consists of a tag, comprising of a microchip and an antenna, which is attached to an object, say passport. Whenever the object comes within the range of the reader, the date contained in the microchip can be read. The RFID tag is a tiny speck, smaller than a grain of sand. It can be mixed with printing ink or can also be incorporated in paper. Life span of coded information in an RFID tag is very long, more than 100 years.

Global RFID market has already touched \$ 4.5 billions. Apart from checking counterfeiting, this technology can also be effectively used to track movement of antiquities, access control etc.

## H. Add-On Security Features

Holograms are a good example of add-on security features. The concept of a hologram has emerged from the need to have a mark of authentication that is simple enough to be identified by even an untrained and illiterate eye, and yet sophisticated enough to make it near impossible to be duplicated. There are several types of holograms available in the market, namely,

- (i) 2D/3D holograms
- (ii) Dot Matrix holograms
- (iii) Electronic beam (EB) holograms

Two dimensional/three dimensional holograms are used more for promotional applications. Their security rating is generally considered low. On the other hand, dot matrix holograms are considered more secure. The latest i.e.

electronic beam hologram, have nano features and very sharp imaginary. They are the most secure. The cost of a hologram is approximately 20 - 30 paise per piece with an additional cost of embedding it on the document at around 20 paise per leaf.

A brief overview of some of the modern security features available in the market is given below:-

- (i) **Invisible printing:** In this technique, invisible ink, that glows under UV light, is used for printing. Such printed matter can not be replicated by photocopying. There is no additional cost of this feature.
- (ii) **Fluorescent Galaxy:** In this feature, Fluorescent stars, dots, curves, logo etc. are printed on the document to give it a distinct look. Microlettering is also used, which glows under Ultra Violet light. The printed matter is visible to the naked eye. In case of doubts, the user examines the document under ultra violet light, under which the printed matter glows. These colours cannot be copied by the colour copier/scanner. This security feature is especially useful for high value documents like DDs, Traveller's Cheques etc. The micro lettering in fluorescent galaxy is an added Security Feature. This feature costs approxi-mately Rs. 45 per 1000 leaves i.e. about five paise per leaf.
- (iii) **Concealed Image:** In this technique, an image is printed on the document which is not visible to the naked eye. It can be seen only

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under a red filter. This feature is provided in SBI Demand Drafts. The cost of a concealed image is also about 5 paise per leaf.

- (iv) **Information Carrier Screen (ICS):** The ICS is a security feature based on a patented process by M/s Jura Trade KFT, Hungary. This feature allows the possibility to hide two different images in the same place. Each of them is decoded in different position of the de-coding device. The embedded image is not readable with any other device. It can not reconstructed with colour copiers or computer-to-print equipment.
- (v) **Chameleon Ribbon Printing/Chameleon Printing:** Chameleon Ribbon can be printed on Security Forms. It is like a strip that appears in different colours when viewed from different angles, making it very difficult to copy. This feature costs about Rs. 125 per 1000 leaves i.e. about 12.5 paise per leaf.
- (vi) **Thermo Chromic Feature:** Logo or any other matter can be printed using thermochromic ink. This impression disappears when rubbed with thumb or when placed on the outside of a warm Tea Cup. After 3 to 5 minutes, the impression reappears. This feature costs approximately 10 paise per leaf.
- (vii) **Fluorescent Fibre Technology:** Security paper embedded with fluorescent fibres, as explained above, is a good security feature. The least count of fibers per square

centimetre can be prescribed. These fibres glow under UV or IR light. If this feature is provided, the cost of paper goes up by about 15% which is not significant.

- (viii) **Instant Verification Technology:** In this technique, special sensitive reactive coating is given to the paper and special transparent pens are provided to the users. To verify the genuineness of the document, the user swipes the pen on the document. If a distinct image appears, the document is genuine. If the pen is swiped with normal security paper or any other paper (without the coating), the image appears in a different colour.

### **Part III : An Overview of Existing Security Features in Currency Notes, Banking Instruments and Government Stamps.**

#### **A. Indian Currency Notes**

Before 1996, currency notes in the country were printed as per AP (Ashoka Pillar) designs. In this design, there were primarily two security features, namely, an AP watermark and a security thread (without microlettering or fluorescence). But after 1996, new designs called MG (Mahatma Gandhi) designs were introduced in view of the increasing instances of counterfeiting and several new features were incorporated. A brief description of security features in different denominations is as follows:-

### 1. Rs. 5/- and Rs.10/-denominations

The following security features have been incorporated in these two denominations:-

- (i) Security paper with 100% rag content.
- (ii) Three watermarks viz. Mahatma Gandhi, RBI and denomination value.
- (iii) Security thread (actually it is a polyester filament) having microlettering i.e. 'RBI' and 'Bharat' written on it in succession.
- (iv) Invisible fluorescent fibres.
- (v) Fluorescent ink.
- (vi) Microlettering behind 'Mahatma Gandhi' on the front side.
- (vii) Complicated line design in the highlighted area, that cannot be replicated in photocopying.
- (viii) Seven-colour dry offset printing.
- (ix) As many as three tints with complicated design plus Body.
- (x) Fluorescence under UV light.
- (xi) Numbering.

### 2. Rs. 20/-, Rs. 50/- and Rs. 100/-denominations

In addition to the features provided in the lower denominations, the following additional features have been incorporated:-

- (i) The three tints are printed using dry offset printing, as in the case of lower denominations, but the Body on the front side is printed by Intaglio process in three colours. This process uses high pressure of 70 tonnes per square centimeter and involves very high capital investment, taking it out of the reach of ordinary forgers.
- (ii) In Rs. 100/- denomination, holographic security thread in stitched type formation with microlettering and fluorescence is provided in place of the continuous thread provided in lower denominations.

### 3. Rs. 500/- and Rs. 1000/-denominations

The following additional security features are provided in these two denominations:

- (i) Body on both sides is printed by Intaglio process.
- (ii) Optically Variable Ink (OVI) is used for printing the main denomination value. This ink changes colour when viewed from different angles. This is a patented product and is supplied by only by M/s SICPA of Switzerland.
- (iii) Numbering on 1000/- denomination note is printed in two colours - blue in upper right corner and red in lower left corner. In all other denominations, numbering is done only in red.

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## **B. Banking Instruments**

A survey of security features provided in banking instruments like demand drafts, cheques, TDRs/STDRs etc. was carried out and it was found that there are no standard guidelines on this subject. Banks have formulated their own guidelines regarding security features based on their own assessment. It was also revealed that in most cases, commercial consideration of keeping the cost low becomes a guiding factor.

In this connection, Indian Banks' Association (IBA) was also contacted in order to find out whether it has issued any guidelines/circulars to banks regarding specifications of minimum security features to be incorporated in security documents. It was revealed that no such guidelines have been issued. Various banks were also contacted in order to ascertain these details. Their replies have been consolidated and are given at Annexure 'A' in a tabular form.

From this table, it can be seen that maximum emphasis is on demand drafts. Some banks like State Bank of India, Oriental Bank of Commerce and Bank of India have provided sufficient security features in their DDs, but there are other banks that have not done enough. Similarly, it is also seen that TDRs/STRDs, cheques, pay orders etc. have been neglected. Even SBI TDR form has only a watermark and invisible printing in it. When contacted, SBI officials informed that chances of forgery in STDRs/TDRs are minimal. However, this is not true. A huge fraud amounting to more than Rs. 50 Crores took place involving TDRs/STDRs of the State Bank

of India only last year. This case was detected and investigated by the CBI vide RC.6(E)/2003/CBI/EOU.VII.

It is pertinent to mention here that most banking instruments like DDs, TDRs/STDRs etc. are for big amounts, but when we compare them to currency notes, it becomes obvious that the security features provided in banking instruments are not commensurate with their face value.

## **C. Government Stamps and Stamp Papers:**

All government stamps are being printed at India Security Press, Nasik and Security Printing Press, Hyderabad. The details of security features provided in different types of government stamps have been tabulated and given in Annexure 'B'.

A perusal of this table shows that except non-judicial stamp papers having denominations of Rs. 10,000/- to Rs. 25,000/-, all other stamps have minimal security features. Not even fugitive ink is used in printing them. Even high denomination adhesive stamps of Rs. 5,000/- denomination also has only a watermark in the name of security features. The designs used are very simple. Colour scheme also remains the same for a range of denominations. Tint is mostly in single colour. Besides, very simple perforation is used.

If we compare these high value stamps with even the lowest denomination currency note i.e. Rs. 5/-, we find that the security features are highly inadequate, even though their face value is very high.

## **D. Miscellaneous Documents:**

### **1. Advance import licences:**

Advance licences are issued to importers to facilitate duty free import of raw materials against export obligations. Against one such licence, duty worth lakhs of rupees can be evaded. Large number of instances of forged advance licences have come to the notice of law enforcement agencies. In just one such case involving 56 fake licences, being investigated by DRI/Ahmedabad, central excise duty worth more than Rs. 15 crores has been evaded. In another instance, [RC.6(E)/2002-SIU.IX/CBI], custom duty worth Rs. 5.2 Lakhs was evaded using a single fake import licence for duty free import of brass scrap through Kolkata Port. This study has revealed that prior to the year 2001, only a watermark and coloured planchettes (fibre dots) were incorporated in these high value documents in the name of security features. Subsequently a new design was introduced in 2001 but only two new security features have been incorporated in addition to the watermark, namely, three colour rainbow printing and 'DGFT' logo in invisible fluorescent ink.

This study has revealed that customs officials at various check points are not aware of these security features and, therefore, they are not able to distinguish between a fake and a genuine licence. This shows that no steps have been taken to train the users to look for the right security features in a security documents. This is despite the fact that there are not more than 100 check points in the country including air, land and sea routes.

### **2. KVPs, NSCs, Indian Postal Orders:**

These high value saving instruments have the following security features:

- (i) Paper is sensitive to 14 chemicals is used.
- (ii) Ashoka Pillar watermark.
- (iii) Ordinary offset ink is used.
- (iv) Single colour printing in both tint and Body.
- (v) There is no tint on the reverse side.

It is evident that in addition to chemically sensitive paper, watermark is the only security feature in these high value documents.

### **3. Passports**

Other than currency notes, passport is the only document that is accorded due importance. A large number of security features have been incorporated in order to make it tamper-proof, namely,

- (i) High rag content paper sensitive to 14 chemicals having 100 GSM and 0.1 mm thickness.
- (ii) Ashoka Pillar watermark.
- (iii) Three colour printing - tint in pale blue and the body in black.
- (iv) Gullouch design in the middle of each page.
- (v) HAUV film printed with invisible UV ink and visible printed ink that glows under UV light.
- (vi) Buckram having GSM of 240.

- (vii) Special stitching thread having three plies (red, white and green) and UV Coating.
- (viii) Gothic numbering on the first inner page having font size of 3 mm.
- (ix) Dye punch.
- (x) Laser numbering using conical perforation. The outer hole has a 0.5 mm diameter and the last hole has a diameter of 0.3 mm.
- (xi) Fluorescent fibers, etc.

Thus, it can be seen that passports have sufficient security features in them and it is very difficult to counterfeit passports.

#### **Part IV: Conclusions & Recommendations**

From the discussion so far, the following facts emerge:-

- (i) Except in currency notes and passports, security features provided in all other security documents, viz. DDs, traveller cheques, TDRs/STDRs, NSCs, KVPs, advance licences, stamps, etc. are highly inadequate.
- (ii) No uniform guidelines/standing orders have been issued either by the Ministry of Finance, RBI or by Indian Banks' Association specifying minimum security features to be incorporated in banking instruments. This important issue has been left to each bank to decide.
- (iii) Each bank, in turn, has left this decision to their Central Stationery Department, where the decisions are guided by commercial

considerations. Cost reduction, rather than fraud prevention, is the guiding factor in such decisions.

- (iv) The security features provided in high value documents like NSCs, KVPs, high denomination stamps etc. are not commensurate with their face value. For example, the design of Rs. 5,000/- special adhesive stamp is the same as that of Rs. 5/- denomination. Even the lowest denomination currency note has many more security features than most of the high value documents, despite the fact that value of some of these documents like advance import licences is in lakhs of rupees.
- (v) The users are not aware of the security features provided in security documents. As a result, they are not able to distinguish between a fake and a genuine document.
- (vi) The reason often cited for lack of adequate security features in security documents is the cost involved. However, this contention is not supported by the facts as the cost of almost all the security features discussed in this paper is negligible. For example, fluorescent galaxy with micro lettering costs approximately Rs. 45/- per 1000 leaves i.e. 4.5 paise per leaf. Similarly cost of concealed image is also about 5 paise per leaf. Invisible printing, bar coding etc. involve even lesser cost. Holograms cost around 20-30 paise per piece. Radio Frequency



Identification (RFID) is the only feature that costs around Rs. 6 - 7 per unit at present. But this is likely to reduce considerably with increase in volumes.

- (vii) Although a system of empenalment of private security printers by IBA for printing banking instruments is in place, yet a technical inspection is carried out by an expert from ISP/ Nasik only at the time of empenalment. No regular audit is carried out by any agency to ensure security at the printers' end.

In short, it is seen that a holistic view has not been taken in decision making on these vital issues affecting national security.

### **Recommendations**

There is an urgent need to review the entire gamut of security printing in the country right from the stage of manufacturing of security paper to spreading awareness amongst users of security documents. In this regard, it is recommended as under:-

- (i) An expert body like Central Pulp & Paper Research Institute may be given the task of working out specifications of a few easily identifiable types of paper to be used exclusively for security printing. This paper should have a distinct look, feel and texture so that even a lay man is able to identify it at one glance. We may decide on more than one type of such security paper depending upon the end use. For example, postal stamps are used only once, so they need paper with short life in

order to prevent re-circulation. On the other hand, non judicial stamp papers need a much longer life.

- (ii) Use of such paper for any purpose other than security printing may be prohibited by law. This would be on the lines of radio frequencies where some frequencies are reserved only for police/military use. A system for regulating the production, distribution and use of such security paper will have to be devised so as to eliminate the possibility of pilferage.
- (iii) Watermark is incorporated in paper at the pulp stage with the help of dandy rolls. Dandy rolls are manufactured only by two firms in the country, namely M/s Shalimar Wires Pvt. Ltd., Calcutta and M/s Dandy Rolls (India) Pvt. Ltd., Bangalore. These suppliers supply dandy rolls to various paper mills for production of watermarked paper. In order to maintain the sanctity of watermark and to prevent counterfeiting, a system should be put in place to regulate manufacturing of dandy rolls, their supply to various paper mills, safe upkeep, condemnation and destruction in order to prevent their misuse.
- (iv) Next to paper, ink is the most important ingredient of printing. We may earmark certain security inks only for security printing. Production and distribution of such ink may be regulated in such a way that they are available only to approved security printers.

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- (v) A comprehensive review of existing security features in high value documents may be undertaken. One such review for strengthening security features in Adhesive stamps was undertaken recently by a committee constituted by the Ministry of Finance in the wake of Telgi scam. Its recommendations have been given in Annexure 'C'.

These recommendations have since been accepted. However, their implementation needs to be monitored closely, as facilities at the Government presses will have to be augmented and new technologies will have to be introduced.

Similar reviews also need to be conducted for banking instruments and miscellaneous documents like railway warrants, advance licences etc. **While deciding on new security features, it should be kept in mind that the purpose of security features is to create a mark of authentication that is simple enough to be identified/understood by the users, yet is sophisticated enough to prevent replication by criminals.** Besides, every document should also have some security feature(s) that is known only to the experts. These are meant for forensic analysis in order to identify a fake document.

- (vi) This brings us to the key area of user awareness. Security features will remain meaningless, if the users are not made aware of them. This

happened in case of advance licences where the users i.e. custom officials manning various checkpoints were found unaware of even the watermark. Users vary from document to document. For example, general public is the user in case of currency notes, where as in case of railway warrants and advance import licences, railway officials and customs officials are the users. User profile needs to be kept in mind while deciding on security features of a document. More importantly, users should be trained to identify the security features. Suitable gadgets will also have to be provided to the users for this purpose e.g. UV lamps, barcode-readers, red polarizers etc.

- (vii) Wherever the users and documents are limited, special procedures can be devised to check counterfeiting. For example, advance licences are issued by DGFT Zonal offices. There is limited number of such issuing offices in the country. Therefore, we can easily have the information regarding each licence issued by DGFT on a website, so that the concerned customs officials can cross-check the genuineness of the licence being produced by a party at the time of cargo clearance.
- (viii) A system of periodical inspection of private as well as Government security printers needs to be put in place in order to ensure that dandy rolls, security inks, security paper, designs, etc. are properly

- accounted for and that systems are in place to ensure highest standards of security.
- (ix) Regarding currency notes, even though adequate security features have been incorporated, yet an additional feature needs to be considered for incorporation to prevent colour photocopying. Colour copying has been used effectively by forgers in recent past, as a common man is unable to distinguish between a genuine currency note and its colour photocopy due to advanced technology. Large number of security features are available today which have been designed specifically to prevent colour copying.
- (x) A similar strategy is required to fight the menace of spurious products. For this, we will have to conceptualize and design a national mark of authentication to be used on the labels/packing of genuine products. This may be on the lines of 'AGMARK' which is a mark of authentication in respect of the quality of a product. We will have to create a similar mark of authentication in respect of genuineness of a product. This feature should be simple enough to be recognised even by an illiterate person, yet should be sophisticated enough to prevent its replication by forgers. Various industry associations - pharmaceuticals, cosmetics, tobacco products, etc. - should be involved in this initiative with minimum Government role.
- (xi) Lastly, R&D initiatives need to be undertaken in the field of Printing Technology on a regular basis, as no one security feature can serve our needs permanently. There is a need to stay one step ahead of the forgers. The Central Government should earmark separate budget to be allocated to Educational and Research Institutes in the country for this purpose. At present, almost all security printing machinery and equipment is imported. Our endeavour should be to develop indigenous technologies suitable for Indian conditions to prevent not only counterfeiting of security documents but sale of spurious products also.

**Security Features Incorporated In  
Various Security Forms Of Leading Banks**

<b>Sl. No</b>	<b>Bank Name</b>	<b>Demand Draft</b>	<b>Banker's Cheque</b>	<b>Cheques</b>	<b>Tdr/Strdr</b>
1	State Bank of India	<ol style="list-style-type: none"> <li>MICR Cheque Paper</li> <li>SBI logo in Water Mark</li> <li>Invisible Printing</li> <li>Concealed Image on the Reverse Side</li> <li>Fugitive Ink</li> <li>Guilloche Pattern.</li> </ol>	<ol style="list-style-type: none"> <li>Water Mark Paper</li> <li>MICR Cheque Paper</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>Watermark</li> <li>MICR Cheque Paper</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>MICR cheque paper with watermark Paper</li> <li>Fugitive Ink</li> <li>Invisible UV Ink</li> </ol>
2	Dena Bank	<ol style="list-style-type: none"> <li>MICR Cheque Paper</li> <li>Water Mark</li> <li>Fugitive Ink For high value DDs following additional features are also employed:</li> <li>Rainbow background printing</li> <li>Flouroscent galaxy feature</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper</li> <li>Water Mark</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper with Water Mark.</li> <li>Fugitive Ink.</li> </ol>	<ol style="list-style-type: none"> <li>Fugitive Ink</li> <li>MICR Paper with bank logo in water mark</li> </ol>
3	Bank of Baroda	<ol style="list-style-type: none"> <li>MICR Cheque Paper with watermark.</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper with Bank Water Mark.</li> <li>Fugitive Ink Printing</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper Bank Water mark</li> <li>Fugitive Ink Printing</li> </ol>	<ol style="list-style-type: none"> <li>Parchment Paper.</li> <li>Fugitive ink.</li> </ol>
4	Oriental Bank of commerce	<ol style="list-style-type: none"> <li>MICR Cheque Paper with Water Mark</li> <li>Fugitive Ink</li> <li>Hologram (Hot Stamped)</li> <li>Micro Line Printing with Fluorescent Ink</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper with Water Mark.</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>MICR Cheque Paper with Water Mark</li> <li>Fugitive Ink</li> </ol>	<ol style="list-style-type: none"> <li>Water mark paper with bank logo</li> <li>Fugitive Ink.</li> </ol>

<b>Sl. No</b>	<b>Bank Name</b>	<b>Demand Draft</b>	<b>Banker's Cheque</b>	<b>Cheques</b>	<b>Tdr/Strdr</b>
5	Indian Overseas Bank	1. MICR Cheque Paper with Water Mark 2. Fugitive Ink. 3. Micro Line Printing (Micro Lettering) 4. Background Printing with Rainbow setting.	1. MICR cheque Paper with Water Mark. 2. Fugitive Ink	1. MICR Cheque Paper with Water Mark. 2. Fugitive Ink.	Not available
6	Union Bank.	1. MICR Cheque Paper with Water Mark 2. Fugitive Ink	1. MICR Cheque Paper with Water Mark. 2. Fugitive Ink	1. MICR Cheque Paper with Water Mark. 2. Fugitive Ink.	N.A.
7	United Bank of India	1. MICR paper with watermark. 2. Fugitive Ink Printing	1. MICR Cheque paper with Watermark. 2. Fugitive Ink	1. MICR cheque paper. with watermark. 2. Fugitive Ink.	N.A.
8	Tamil Nadu Mercantile Bank Ltd.	1. MICR paper with mill watermark. 2. Fugitive Ink.	1. MICR Cheque Paper 2. Water Mark 3. Fugitive Ink	1. MICR Cheque Paper with Water Mark. 2. Fugitive Ink.	N.A.
9	Bharat Overseas Bank Limited	1. MICR Cheque Paper. 2. Watermark. 3. Fugitive Ink. 4. Background Rainbow Printing 5. Invisible Printing 6. Micro Line Printing (Micro Lettering).	1. MICR Cheque Paper with watermark. 2. Fugitive Ink 3. Background Rainbow Printing 4. Invisible Printing	1. MICR Cheque Paper with watermark. 2. Fugitive Ink 3. Background Rainbow Printing	N.A.
10	UCO Bank	1. MICR Cheque Paper with Bank Watermark. 2. Fugitive Ink Printing	1. MICR Cheque Paper with Bank Watermark 2. Fugitive Ink Printing	1. MICR Cheque Paper with Bank Watermark 2. Fugitive Ink Printing	N.A.
11	Punjab National Bank	1. Paper with Bank watermark 2. Fugitive Ink.	1. MICR Cheque Paper with Bank Water Mark. 2. Fugitive Ink Printing	1. MICR Cheque Paper Bank Water mark. 2. Fugitive Ink Printing	1. MICR Cheque Paper Bank Water mark. 2. Fugitive Ink Printing

### Security Features In Government Stamps

Sl.No.	Name & Description	Security features
1	Postal Stationery	Almost no security features. A parallel line watermark is provided in case of envelopes. Even registration envelopes have only a watermark, although it costs more than Rs. 20/-
2	Adhesive stamps viz. special adhesive stamps, Court fees stamps, revenue stamps, share transfer stamps, etc. (Denominations upto a maximum of Rs. 5,000/-)	(i) 70 GSM paper with 9 GSM gumming. (ii) Ashoka Pillar watermark. (iii) Perforation having 0.9 mm diameter and pitch - 13 X 13. (iv) Two colour printing - tint in one colour and body in another.
3	Public postage stamps (PPS) (Denomination from .25 paise to Rs. 50/-)	Same as above.
4	Non judicial stamp papers (Denominations from rupee 1 to Rs. 25,000/-)	(i) Ashoka Pillar Watermark (ii) In Rs. 10/- and above denominations, 100% rag content paper having 82 GSM is used. (iii) Up to Rs. 5,000/- denominations, only two colour printing - one for the tint and one for the body. However, in Rs. 10,000/- and above, rainbow printing with fluorescent ink is used. The tint also has denomination value printed all over. (iv) Security thread is provided in Rs. 10,000/- to Rs. 25,000/- denominations.
5	Court fees stamps. (Denomination from Rs. 50/- to Rs. 5,000/-)	Same as in non-judicial stamp papers.

#### Annexure 'C'

#### Recommendation of the Committee Constituted By The Ministry Of Finance To Augment Security Features Of Government Stamps.

##### (A) For low value denomination stamps (below Rs. 5/-)

The following recommendations have been made:-

- (a) Paper : (i) Dandy Roll Water mark paper.  
(ii) Paper should be purchased from accredited manufacturers having lab certification from NABL and ISO-17025.
- (b) Perforation : A special design perforation in all the four sides of a stamp.

- 
- (c) Printing: Minimum two color ink with micro printing/lettering with year and batch.
  - (d) Gumming: Gumming should be of high quality and shall have fluorescence under UV light.

**(B) For High value stamps**

**(Rs. 5/- and above)**

In addition to the security features proposed above for low value stamps, the following additional recommendations have been made:-

- (a) Paper : (i) Water mark paper with visible and in-visible fibres under UV light.
- (ii) Paper should be purchased from accredited manufacturers having lab certification from NABL and ISO-17025.
- (b) Perforation : Perforation should be with special design, perforation in all the four sides and in the body of the stamp (other than postal stamps) at suitable place and design like India post wing for DOP and Ashoka Pillar for fiscal stamps.
- (c) Printing: Minimum three color or more (including one color of UV ink) with micro printing/lettering with year and batch.
- (d) Intaglio printing design to be introduced in high value fiscal and definitive series stamps.
- (e) Invisible printing with fluorescent ink (under UV light) postal wings or denomination may be printed with invisible ink.

**(C) General recommendations**

- (i) Re-designing of all varieties of stamps is to be done by increasing the size of stamp with more white space.
- (ii) Design features produced with software like information carrier screen and compensated digital screen to be introduced in high value stamps.
- (iii) Rationalisation of denominations of all varieties of stamps: It is strongly recommended that denominations above Rs.100/- should be discontinued due to limitation of size to add more security features.
- (iv) Special perforation features to be varied denomination wise.
- (v) A randomly generated Alpha numeric number to be introduced as a covert feature for year wise or batch wise to facilitate backward tracking and their forensic examination.
- (vi) High definition Hologram or latent image hologram to be introduced on stamps with face value with Rs. 50/- and above.
- (vii) It is recommended that design of stamps to be reviewed every three years by a committee consisting of MOF, GM/ISP & SPP and three IG (R&S) from State Governments and Forensic Scientist from Nodal laboratory.
- (viii) Nodal Forensic Lab should be identified to create data base and R&D work.

# Syllabic Nuclei of Similar Vowel Quality as a Clue for Forensic Speaker Identification –A Study on the Isolated Spoken Words

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## Introduction

Identification of person on the basis of voice characteristics is proving to be one of the important techniques of identification in the modern world of highly advanced communication systems. Recorded conversation through communication device is frequently encountered in the criminal offences such as kidnapping, hoax message, extortion, threatening calls and bribery cases. Identification of speaker on the basis of voice characteristics is done when the characteristic features of a recently recorded questioned speech sample of the unknown person are compared with the specimen speech samples of the suspect (s). Generally, the specimen samples are obtained by making the suspect to read from a given text or transcript of the conversation as in the questioned sample. However, in some of the cases, the suspect refused to give the specimen speech sample as desired by the investigator or the speech sample was not obtained as per the guidelines. In some cases the suspect

## Key Words :

Clue words, onset, Syllabic Nuclei.

## Abstract :

*In forensic speaker identification practices, the clue words for spectrographic comparison, which are of same context or dialect, are selected. When the context of the specimen speech materials are different from that of the questioned sample, sufficient clue words are difficult to select out of the speech material provided for spectrographic method of voice comparison which usually leads to no-opinion rather than probable or positive identification even though auditory examination reveals positive matching. Studies have been conducted on the isolated spoken words having similar vowel quality as syllabic nuclei preceded by consonant having same place of articulation for forensic importance as clue words for comparison. Some of the measurable speaker dependent parameters are studied with the selected vowels as /a/, /e/, /i/, /o/ & /u/ uttered by fifteen speakers and found useful for forensic speaker identification, though they are preceded by different consonants having same place of articulation. Thus in a situation where sufficient clue words could not be selected from the speech materials provided, the words/syllables having vowels of same quality preceded by different consonants having same place of articulation as onset are found to be the only alternative technique of clue word selection for comparison by spectrographic method.*

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provide only certain part of the text on some other dialects other than the one in the questioned sample. For example, the conversation in questioned speech is in standard Hindi whereas the specimen speech sample is obtained in Haryanvi. When the context of the specimen speech materials are different from that of the questioned sample, sufficient clue words could not be obtained for spectrographic method of voice comparison. Various methods and speaker dependent acoustic parameters have been suggested based on previous experiments [1,2,3,4]. Studies also been conducted on non-contemporary speech samples [5] and effect of context [6]. A comparative study of disguised in Hindi speech samples in different accents & speech [8] have been performed by scientists. Speaker dependent parameters have been discussed in the literatures [9,10,11]. The above-mentioned methods and the acoustic parameters are restricted only for the conventional method of clue words selection. In the recent past, computer based text independent speaker identification systems were reported. However in view of the performance and high error rate of the computerised system in the forensic environment, the combined method of Auditory followed by Spectrographic analysis have been continued to be a valid technique for forensic speaker identification in the Court of Law.

In this paper, studies have been conducted on the isolated spoken words having similar vowel quality as syllabic nuclei preceded by consonants of similar place of articulation for forensic importance as clue words for comparison.

## Methodology and Experimentation

### 1. Sampling of speech material

Pairs of words having same vowel quality as syllabic nuclei have been selected. These vowels are preceded by different consonants uttered at same place of articulation. Five different vowels, namely /ʌ/, /e/, /i/, /o/ & /u/ and five different words having these vowels as nuclei have been selected for this experiment.

The words have been chosen specifically to study various acoustic features during analysis. /kʌ/ & /gʌ/ are closed syllables having velar plosive consonants as onset, unrounded mid-open back vowel as nuclei and lateral consonant as coda. Similarly, /phu:l/ & /bhu:l/ are also closed syllables but having aspirated bilabial voiced consonant as onsets, rounded closed back vowel as nuclei and lateral consonant as coda. These words have been selected to observe the feature due to lateral because lateral itself behaves as a vowel acoustically.

Syllables /tin/ & /din/ having dental plosive consonant as onset, unrounded closed front vowel as nuclei with nasal stop as coda; have been selected to study formant energy distribution as a nasalisation feature.

/to/, /do/, /be/ & /pe/ are open syllable words having plosive consonants as onsets, rounded mid- closed and unrounded mid- open vowels as nuclei with zero coda.

15 different male speakers including native as well as non-native, have been selected for this study. Their linguistics

backgrounds have also been noted. Speech samples of all 15 speakers have been directly recorded on computerized speech laboratory (CSL) at the sampling rate of 22050Hz and 16-bit quantization in three repetitions. Each of the selected words spoken in isolation has been chosen on the basis of clarity of the utterance.

**Table -1:** Words selected for this study with specific vowels

S.No.	Word	Comparative Word	Vowel
1.	k^l	g^l	/^/
2.	phu:l	bhu:l	/u/
3.	tin	din	/i/
4.	to	do	/o/
5.	bε	pε	/ε/

## 2. Experiments

Selected words are subjected to spectrographic analysis at the sampling rate of 11025 Hz. Spectrographic pattern analysis has been performed using analytical wide band filter of the order of 323 Hz and Linear Predictive coding (LPC) analysis with frame size of 20 ms and filter of the order of 12. Parameters, namely, Formant frequencies ( $F_1$ ,  $F_2$ ,  $F_3$ ), Transition of second formant ( $F_2$ ) and Ratio of amplitudes ( $A_1$ ,  $A_2$ ) have been measured at appropriate places. Duration of syllabic nuclei ( $D_n$ ) and Syllabic duration ( $D_s$ ) also been determined.

**Table - 2 :** Comparative Feature Parameters Extracted for Isolated Words /k^l/ Vs /g^l/

Acoustic Features	$F_1$ (Hz)		$F_2$ (Hz)		$F_3$ (Hz)		Duration of Nuclei $D_n$ (ms)		Duration of Syllable $D_s$ (ms)		Ratio ( $A_1:A_2$ )	
	/k^l/	/g^l/	/k^l/	/g^l/	/k^l/	/g^l/	/k^l/	/g^l/	/k^l/	/g^l/	/k^l/	/g^l/
S1	670	670	1139	1139	2431	2431	106	104	365	320	3.40	3.03
S2	595	595	1476	1476	2595	2595	165	144	357	372	0.92	.85
S3	667	667	1357	1357	2095	2095	109	127	249	261	1.32	1.58
S4	617	617	1286	1286	2396	2396	113	121	399	366	0.823	0.877
S5	564	564	1410	1410	2467	2467	80	81	351	359	1.97	1.33
S6	651	651	1251	1251	2061	2061	110	110	350	344	1.26	1.85
S7	564	564	1251	1251	2290	2290	98	134	269	289	0.61	0.68
S8	599	599	1198	1198	2485	2485	118	115	381	335	2.46	2.15
S9	667	667	1381	1381	2476	2476	141	148	334	302	1.11	1.60
S10	620	620	1190	1190	2642	2642	121	165	249	318	0.96	1.36
S11	690	690	1238	1238	2500	2500	114	119	424	408	0.84	0.73
S12	714	714	1262	1262	2452	2452	170	190	370	391	0.80	0.73
S13	667	667	1452	1452	2738	2738	103	107	312	350	1.34	1.34
S14	404	404	1380	1380	2571	2571	108	107	299	347	1.12	1.25
S15	667	667	1381	1381	2476	2476	98	101	374	365	1.54	1.89

**Syllabic Nuclei of Similar Vowel Quality as a Clue for Forensic Speaker Identification –A Study on the Isolated Spoken Words**

**Table - 3:** Comparative Feature Parameters Extracted for Isolated Words /phu:l/ Vs /bhu:l/

Acoustic Features	F <sub>1</sub> (Hz)		F <sub>2</sub> (Hz)		F <sub>3</sub> (Hz)		Duration of Nuclei (ms)		Duration of Syllable (ms)		Ratio (A1:A2)	
	/phu:l/	/bhu:l/	/phu:l/	/bhu:l/	/phu:l/	/bhu:l/	/phu:l/	/bhu:l/	/phu:l/	/bhu:l/	/phu:l/	/bhu:l/
S1	319	319	789	789	2498	2498	173	174	280	319	1.03	1.10
S2	310	310	857	857	2452	2452	265	236	409	418	1.11	1.28
S3	261	261	809	809	2666	2666	116	126	200	218	1.65	1.79
S4	352	352	934	934	2590	2590	113	127	296	367	1.75	2.01
S5	352	352	863	863	2220	2220	126	141	289	260	1.30	1.75
S6	335	335	740	740	2626	2626	199	196	336	321	5.36	3.48
S7	388	388	687	687	2484	2484	236	231	327	325	0.89	0.69
S8	405	405	643	643	2548	2548	374	343	455	439	8.70	6.63
S9	357	357	833	833	2690	2690	251	265	377	307	1.19	2.50
S10	333	333	905	905	2667	2667	296	276	436	410	1.29	1.99
S11	333	333	833	833	2642	2642	295	298	443	434	1.22	2.05
S12	357	357	880	880	2642	2642	256	213	388	309	3.48	3.87
S13	404	404	738	738	3047	3047	159	162	335	340	1.52	1.26
S14	333	333	809	809	2380	2380	156	145	323	359	1.35	1.64
S15	405	405	687	687	2220	2220	251	245	358	259	0.68	0.71

**Table - 4:** Comparative Feature Parameters Extracted for Isolated Words /tin/Vs/din/

Acoustic Features	F <sub>1</sub> (Hz)		F <sub>2</sub> (Hz)		F <sub>3</sub> (Hz)		Duration of Nuclei (ms)		Duration of Syllable (ms)		Ratio (A1:A2)	
	/tin/	/din/	/tin/	/din/	/tin/	/din/	/tin/	/din/	/tin/	/din/	/tin/	/din/
S1	300	300	2160	2160	3042	3042	214	229	445	370	2.35	2.28
S2	286	286	2048	2048	2667	2667	288	287	472	460	0.94	1.19
S3	357	357	2143	2143	3095	3095	168	171	364	369	1.30	0.90
S4	317	317	2150	2150	3119	3119	83	80	425	391	1.96	1.98
S5	300	300	2308	2308	2978	2978	196	201	356	349	1.34	2.09
S6	388	388	2449	2449	3225	3225	206	211	381	387	2.61	2.51
S7	282	282	2344	2344	3136	3136	200	226	394	391	0.34	0.39
S8	264	264	2396	2396	2801	2801	239	249	473	408	0.40	0.56
S9	310	310	2357	2357	2952	2952	251	158	389	318	0.99	1.01
S10	333	333	2095	2095	2690	2690	241	256	374	441	2.74	2.85
S11	285	285	2285	2285	2785	2785	228	230	498	481	3.76	3.11
S12	310	310	2119	2119	—	—	319	315	470	473	1.19	1.17
S13	404	404	2404	2404	2904	2904	182	193	316	303	0.91	0.70
S14	285	285	2476	2476	3595	3595	238	198	422	418	5.25	5.23
S15	333	333	2309	2309	2652	2652	211	229	458	425	4.55	3.96

**Table - 5:** Comparative Feature Parameters Extracted for Isolated Words /bɛ/vs/pɛ/

Acoustic Features	F <sub>1</sub> (Hz)		F <sub>2</sub> (Hz)		F <sub>3</sub> (Hz)		Duration of Nuclei (ms)		Duration of Syllable (ms)		Ratio (A1:A2)	
	/bɛ/	/pɛ/	/bɛ/	/pɛ/	/bɛ/	/pɛ/	/bɛ/	/pɛ/	/bɛ/	/pɛ/	/bɛ/	/pɛ/
S1	376	376	2112	2112	2948	2948	183	201	200	223	1.16	1.66
S2	429	429	1881	1881	2548	2548	251	290	388	347	1.49	1.26
S3	357	357	2023	2023	2765	2765	269	292	315	324	1.50	1.48
S4	370	370	1833	1833	2608	2608	199	193	249	223	1.15	1.08
S5	440	440	2044	2044	2767	2767	228	228	292	299	3.54	3.05
S6	388	388	2238	2238	2960	2960	171	178	307	317	1.34	1.54
S7	388	388	2062	2062	2714	2714	296	283	342	330	1.31	1.64
S8	458	458	2062	2062	3295	3295	295	297	354	288	0.74	0.95
S9	429	429	2095	2095	2833	2833	301	283	313	292	0.70	0.77
S10	357	357	1976	1976	2524	2524	194	200	230	288	1.35	1.25
S11	428	428	1976	1976	2690	2690	201	210	413	404	0.14	0.86
S12	333	333	2047	2047	2333	2333	351	381	371	382	0.81	1.19
S13	404	404	2357	2357	2833	2833	310	290	316	267	1.32	1.13
S14	357	357	2190	2190	2880	2880	236	279	301	344	1.97	1.51
S15	358	358	2062	2062	3295	3295	210	256	402	415	1.79	1.25

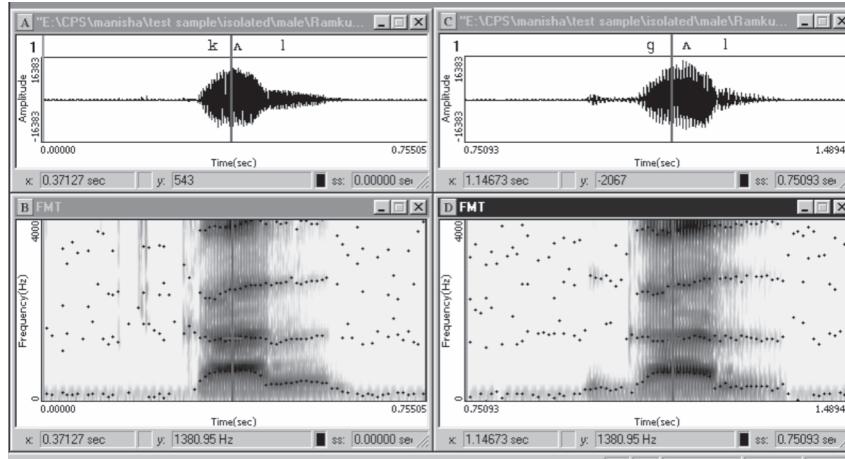
**Table - 6:** Comparative Feature Parameters Extracted for Isolated Words /to/ Vs /do/

Acoustic Features	F <sub>1</sub> (Hz)		F <sub>2</sub> (Hz)		F <sub>3</sub> (Hz)		Duration of Nuclei (ms)		Duration of Syllable (ms)		Ratio (A1:A2)	
	/to/	/do/	/to/	/do/	/to/	/do/	/to/	/do/	/to/	/do/	/to/	/do/
S1	376	376	770	770	2441	2441	211	242	246	250	1.72	2.13
S2	381	381	905	905	2619	2619	415	362	419	427	.069	0.61
S3	357	357	857	857	2238	2238	263	229	310	301	1.41	0.98
S4	335	335	793	793	2661	2661	201	209	271	275	1.79	1.89
S5	405	405	900	900	2537	2537	359	353	400	349	1.71	1.74
S6	441	441	863	863	2714	2714	300	292	321	287	9.25	9.02
S7	370	370	758	758	2626	2626	272	270	354	289	1.34	1.22
S8	405	405	833	833	2429	2429	365	310	364	336	1.52	2.82
S9	452	452	786	786	2762	2762	373	310	431	415	1.09	1.90
S10	405	405	905	905	2762	2762	233	327	240	342	2.76	2.58
S11	452	452	857	857	2595	2595	303	289	462	465	1.26	1.14
S12	428	428	785	785	—	—	378	361	406	376	2.49	2.34
S13	380	380	880	880	2809	2809	267	269	302	296	2.32	2.16
S14	357	357	880	880	2547	2547	347	304	365	361	1.01	2.30
S15	370	370	880	880	2626	2626	415	426	19	426	0.96	1.01

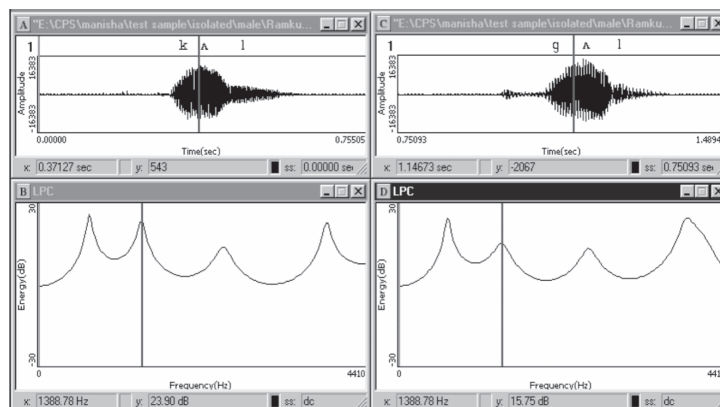
**Results and discussions**

Fig 1 & Fig 2 represent the results of spectrographic analysis and their respective LPC of comparative words /kʌl/ & /gʌl/ (closed syllables with lateral consonant as coda). It can be observed that the lateral consonant itself is behaving as a vowel in the syllable. Similarly, Fig 3 & Fig 4 represent the results of spectrographic analysis and their respective LPC analysis results of comparative words /tin/ & /din/ (closed syllables with nasal stop). It shows that all formant frequencies as well as formant pattern remain same for both

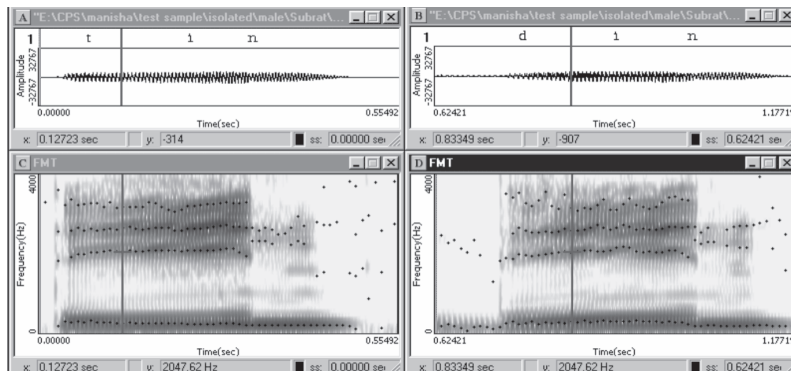
the words. Inter formant energy distribution is also observed as a feature of nasalization in both the words. Similarly, Fig 5 & Fig 6 represent spectrograms and results of LPC analysis of words /bɛ/ Vs /pɛ/ (open syllables with zero coda). All formant frequencies and formant pattern remain same but duration of syllabic nuclei varies unlike the previous case. Formant transition of these comparative words can be observed in all the figures. In non – native speakers it is very rare to have similar formant transition along the entire formant band even for same vowel



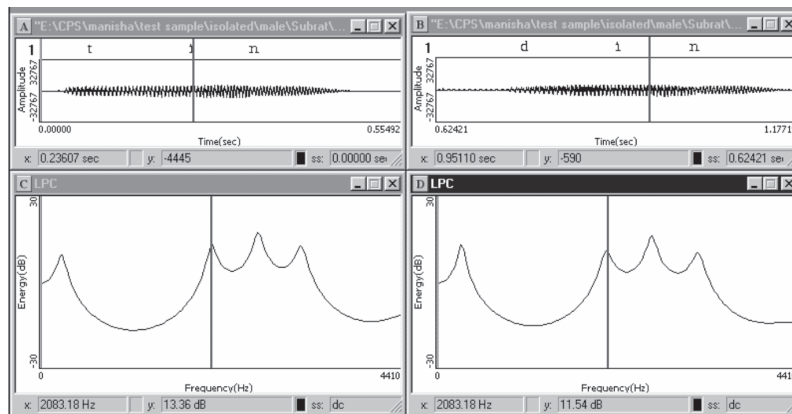
**Fig 1 :** showing waveform with phonetic transcript of words /kʌl/ & /gʌl/ in window A & B; their respective spectrogram with formant marking in window C & D.



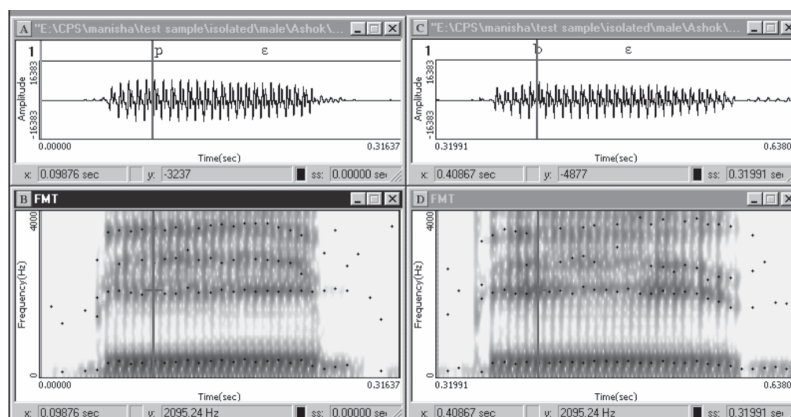
**Fig 2 :** showing waveform with phonetic transcript of words /kʌl/ & /gʌl/ in window A & B; their respective spectrogram with formant marking in window C & D.



**Fig 3 :** showing waveform with phonetic transcript of words / **tin** / & / **din** / in window A & B; their respective spectrogram with formant marking in window C & D.

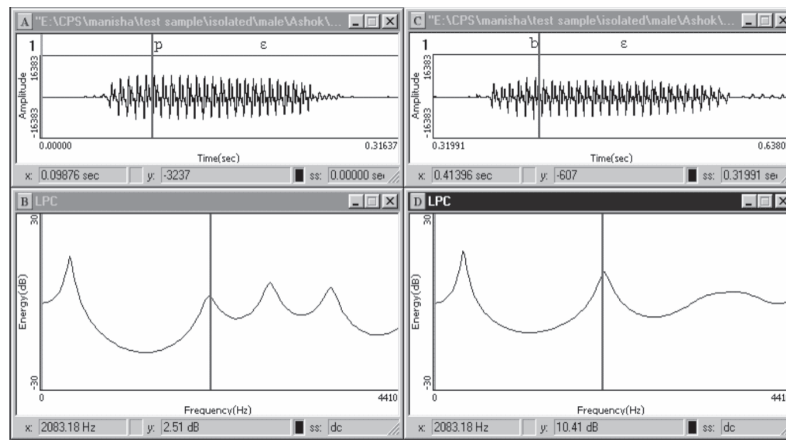


**Fig 4 :** showing waveform with phonetic transcript of words / **tin** / & / **din** / in window A & B and their respective LPC in window C & D.



**Fig 5 :** showing waveform with phonetic transcript of words / **be** / & / **pe** / in window A & B; their respective spectrogram with formant marking in window C & D.

**Syllabic Nuclei of Similar Vowel Quality as a Clue for Forensic Speaker Identification –A Study on the Isolated Spoken Words**



**Fig 6:** showing waveform with phonetic transcript of words /be/ & /pe/ in window A & B and their respective LPC in window C & D.

The average values of formant frequencies ( $F_1$ ,  $F_2$ ,  $F_3$ ), Second formant transition, Duration of syllabic nuclei ( $D_n$ ), Duration of syllable ( $D_s$ ) and the Ratio of amplitudes ( $A_1 / A_2$ ) have been calculated separately for all 15 speakers as shown (Table 2 to Table 6). Column chart diagrams showing comparative formant frequencies for all pairs of isolated words are shown in Fig 5 to Fig 9. It is observed that for each pair of comparative words, formant frequencies ( $F_1$ ,  $F_2$ ,  $F_3$ ) are similar for all speakers. Column chart diagrams representing duration of syllabic nuclei ( $D_n$ ) for all comparative isolated words are shown in Fig 10 to Fig 14. It is observed in Fig 10 that the duration of syllabic nuclei for word /kʌl/ is quite different from the duration for word /gʌl/ in speaker 2,3,7,10 and 12 while in rest of the speakers this variation is very small or it is almost similar in both the words. Similarly in Fig 11, speaker 2, 3, 4, 5, 8, 9, 10 & 12 have more variation in duration of syllabic nuclei than the variations in rest of the speakers for words /phu:l/ & /bhu:l/. It is found that the speakers mentioned above are non-native

speakers and in comparison to them a native speaker can maintain similar duration while speaking similar vowels in different utterances. Another exemplar having closed syllable with nasal stop as coda (/tin/ & /din/) is shown in Fig 12, where the variation in all the speakers (whether native or non-native) is very small. Again if we consider the case of an open syllable in Fig 13 & Fig 14 we can see the variation of duration in speaker 1,2,3,8,9,10,14 and 15 for words /be/ & /pe/ as well as in speakers 1, 2, 3, 4, 8, 9, 10, 11, 12, 14 & 15 for words /to/ & /do/. In case of open syllables the native speaker also got variation in the duration of syllabic nuclei. This variability can be minimized if the sampling is done from the verbatim words.

**Conclusion**

Presently there are various new and sophisticated methods have been developed for identification like text independent identification systems and computerized speaker identification systems but in forensic situation the admissibility of the decision down on

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the basis of automatic method is still in question. The valid & well-accepted method among scientific community in the process of investigation is the auditory examination followed by spectrographic analysis.

The intra speaker variability observed in some speech exemplars is due to selection of words in non-verbatim situation, as the study has been conducted in non-verbatim speech exemplars. Thus, the words having similar vowel quality selected from verbatim syllable can be used as clue for effective comparison. Closed syllables having stop/plosive as coda are found to be more suitable than open syllables and also non –lateral onset/coda shows less variability in other parts though formant frequencies remain same for both opened and closed syllable.

It is also concluded that syllable with same vowel quality having different onset/coda, having same place of articulation have shown efficiency as clue words and can be used to compare voice of unknown speaker from the speech samples in different context. On the basis of the results of this experiment, the method of clue word selection can also be used for speech samples in different language/dialects of a language if syllables with same vowel quality having different onset & coda with same place of articulation are found available.

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# Homicide Investigation and Punishment in Ancient India. (From Early Times to 647 A.D)

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I am making an attempt to collect stray incidents of homicide and also the so called Genocide of those days, as depicted in different literary pieces of respective periods. It is not entirely a new topic or my first attempt on the subject, but many more writers have done appreciably extensive works. It is very interesting, useful and enlightening to know that acts of ghastly and very sensitive homicides, in those days, were, some time, described as the deeds of heroism and acts of bravery. Accounts of killing of demons by Gods, very often clandestinely and surreptitiously, when taken in view of modern definition, such incidents were homicides, but in those days, they used to be appreciated by the then society and, the state, as acts of valour and heroism. It is quite true that, as, of today, incidents of crime, in those days, were meager and very negligible but homicide and genocide used to occur in connections with fights between two races or classes for their survivals.

In the primitive society institutions of property, family and class or caste are hardly to be found in the earliest stage of

## Key Words :

*Homicide, Primitive Society, Reasons, and Motive of Homicide, Genocide Indus Valley civilization, Vedic Age, The Ramayan and the Mahabharat Age, Dharmashastra, Codification of Indian Law, Kautilyan Arthashastra, Prostitutes, Harlots, Human Sacrifice, Brahmanicide, Sati system, Infanticide, Feticide, Investigation, Postmortem, Punishment, Capital Punishment, Seditious Minister, Unjust, Feudal, Toiling.*

## Abstract :

*This article is of immense academic interest and it is an attempt to present a picture of homicidal incidents in the remote past of Indian society. Society, in the past also, was not free from incidents of crime and the then State machinery had devised a very successful methodology to prevent, detect and control such re-occurrence of criminal incidents. Though police administration or criminal dispensation justice system of modern type did not exist so full fledgedly, yet the then government have devised very effective methods to catch the criminals, put them under trial and to ensure the deterrent punishment to the real culprits. Due care was taken to ensure that innocent must be allowed protection and be left out without any punishment but utmost care was taken to a sure short I punishment to the guilty. Treatment of State government and other public servant to the people of the state was not equal and uniformed and for the same offence culprits of different castes were differently treated and unequally punished. Brahmins enjoyed the great privilege and were having less punishment, and next to them Kshatriyas were treated with higher esteem and the rest two castes- Vaishyas and the Sudras were punished with all cruelty and tortures. Privileged few enjoyed all the privileges and the common people and masses were ' maitre acted and punished with all severity. Females and Sudras were treated worst than the animals.*

*\* D.I.G. of Police, Saharsa.*

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the man's life. In the absence of such institutions, the state also did not exist.<sup>1</sup> But with the gradual advancement of art of cultivation, dwelling houses, tendency to store and acquisition of personal property emerged, necessity of state and government were felt, and were also created. "This is thine, this is mine,"<sup>2</sup> had given a new turn in the human mind in respect of concept of acquisition of personal property. Mutual struggles started taking place and crimes like theft of cattle, robbery, dacoity, abduction, kidnapping, adultery, rape, murder and some time mass-killing also, started occurring, when a larger section of people of society, were exploited by both the state, government officials, and the rich section of society. Hence the kingly office arose to protect the weak against the strong.<sup>3</sup> Have-nots' class were the worst victims and were oppressed and exploited both by the haves' and the state government. This accumulated frustration, later on, resulted in commission of heinous offences and in many cases, homicides too, were due to largely this reason.

### **1. Background (Reasons of the Homicide):-**

The primitive Society was entirely different from the modern world of today, and it is universally true that, in spite of numerous tremendous external changes in the society and human being in particular, inner basic instincts have remained unaltered and more or less the same. Hence in the remote past also, causes of homicide or suicide or genocide, were more or less the same as

of present day. Laws in those primitive stages, were not promulgated, as of today, and methods of punishments were also completely distinct, as that of modern times. The size of countries, compared to modern ones, was very small and communications and movements inside or outside the boundaries of the states were intricate, cumbersome and of very difficult ones. Neither the culprits, nor the police administration, was well equipped and their movements, from one place to the other one, were not swift or convenient.

### **A Investigative Agency in the past:-**

Police administration in particular was not in existence, as an independent agency of the government in those days but in general administration only, certain officers were entrusted with the task of performing the police job. For the administrative convenience, the king or monarch had devised decentralization of administration and the village headman, in normal course, was held responsible for prevention and detection of crimes and for ensuring recovery of stolen, or looted properties, or detecting the incidents of murder or homicides, for finding out the reasons of suicide and genocide.

### **B. Reasons and Motive of Homicide:-**

Revenge, quarrels, anger, land disputes, jealousy, loss of prestige, sudden and immediate provocations, sexual grudges and greed to grab one's property and resistance in looting or robbing the traders and sometime even

without resistance, with a motive to mutilate the evidences and mass killings in the battle or fights, starvation or mental-frustrations, religious rivalry, or sudden clashes were some of the important reasons of homicide and genocide in the olden days also like the present times.

### **C. Definition of Homicide:-**

Like modern days homicide used to be an act of killing of a human-being by a human being in the past also. It was different from Suicide in that the former involves two parties-the killer and the killed and the intentions behind commission of this crime were completely different and varied in nature. Emile Durkheim, in 'Suicide' wrote "Among the different species of death, some have the special quality of being the deed of the victim himself resulting from an act, whose author is also the sufferer, and the same characteristic, on the other hand, is certainly fundamental to the usual idea of suicide."<sup>4</sup> E. Lombroso in his famous book-"CRIME -Its Causes and Remedies," has illustrated, "Generally there are two forms of criminality, manifesting themselves side by side- atvistic criminality, which is a return on the part of certain individuals of morbid constitution to the violent means of struggle for existence such as homicide, robbery, rape and evolutive criminality, which is no less perverted in intent but more civilized in the means employed, for, in place of violence, it uses trickery and deceit."<sup>5</sup> The crime of committing homicide or murder or suicide taking one's own life violently (Suicide) or

human sacrifices or mass massacre in wars, or killing a particular individual here and there, actuated by personal motives, were as also the existence of man and they go side by side, the motive, which used to prompt a man to commit murder or other heinous crime were more or less the same in the olden days as they are today. Sometime the causes being of the issue of survival of one tribe or clan or race used to be in the root, sometime religious rituals in the form of human sacrifices and genocide, being committed due to frequent invasions on each other for their supremacy, aggrandizement of empire or mass killing by demons or Gods. What is, in modern context heinous crimes, were in those days the acts of heroism or bravery. Thousands of innocent people, war captives, and other victims, were murdered, sometime, without any rhyme and reason and without any full justification. There did not exist any international bodies or forum to examine the state-excesses or genocide or war crimes. Religion and religious sentiments were wrongly interpreted or twisted as to suit and cater to their barbaric instincts."<sup>6</sup>

Socio-Psychological factors like present day, also used to root behind the commission of major crime, and when, we talk of non-existence of certain crimes in the primitive societies, its broad reasons were lying in social environment. The growth of crimes in modern days, with the developmental march of society towards industrial and other scientific advancements, are intimately related to and associated with the growing need of man, economic disparity, unequal treatments, exploitation, injustice and

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provocative frustrations. Criminals are not inborn but are made criminals partly by social conditions and partly by the situation which induced them to offend.

## 2. Age of Indus Valley Civilization :-

Excavated materials of the oldest Indian Civilization at Harappa and Mohan-Jodaro furnished and enabled us to believe the existence of highly developed and organized society. Unfortunately written accounts, like Babylonians and some other old Civilizations like Egyptians, are lacking to know the law and order and crime positions of the then civilizations. Crimes in particular have their roots in the conflict of self seeking habits of the individual with common customs of any society, which ensure its survival in the struggle for existence. In the primitive and infancy stage of human evolution, one did not realize being hurt but with the advancement of economy exploitation started increase in frustration and struggle which led to commission of crimes. Even during the most early civilization of Indus Valley, huge remains of skeletons and human bones have been exhumated, which indicate some massive loss of human life in some fierce fights of two races, amounting to traces of genocide in such an early part of human race. Much more is not known about crime of this age but traces of developed urban based civilization, developed town planning, advanced international trade and commerce, all these indicate about a prosperous society as well as economic disparity which must have led to crimes being committed by the exploited poor and impoverished in vengeance and out

of frustration, largely due to economic disparity. Details about this period are yet to be collected by the historians and archeologists.

## 3. Vedic Age:-

In the Vedic period, crimes do not seem to have been in large number. But in those days also economic disparity was existing in abundance. Class of the poor were being exploited to the maximum, which led to commission of crimes frequently. A passage in the Rig-Veda is referred to the employment of trained men for recovering stolen cattle<sup>7</sup>. There are several illustrations of homicides and genocide in Vedic Literatures, Rig Veda and Ayur Veda, Aiteraya-Brahman and Upnishads. Western writers on Rig-Veda and other Vedas have mentioned that the Aryans were barbarous, drinkers, aggressors (Invaders) and cruel hearted and they had killed or driven out the Dravidians / Tribals to jungles.<sup>8</sup> According to Rig-Veda 4,30, 15 “उत्र दासस्य वर्चिनः सहस्राणि शतावधीः अधि पव्य प्रधीरिव”।

According to Sayan -1500 Slaves of Barchi were killed by Indra,<sup>9</sup> God Vishnu had killed Mayabi Vrish shipra ( दासस्य चिद्वषशिप्रस्य मायाजधुः )<sup>10</sup>. Indra had killed Smadiv, Tugra and Vetasaon. ( अहं पिते वेतसूर भिष्टये तुग्र कुत्साय स्मदि यं च रन्धयम ).<sup>11</sup> Arya -Dasyu-Battle is mentioned in Rigveda and it is depicted as a very gruesome and devastating battle and for Daviti (दभीति), Indra had butchered 30,000 (Thirty Thousand) slaves. (अस्वापयद्यभीतये सहस्रा त्रिशंत हथैः दासानां इन्द्रो मायय)<sup>12</sup> In another depiction for Varchi Indra killed 10,000 (one lakh) fighters, (उत्र दासस्यः चर्चिन सहस्राणि शतावधीः अधि पंच प्रधीरिव)<sup>13</sup> In another Ryme, mention of

killing of fifty thousand people of krishnavarna, is described (पञ्चाशत्कृष्णा नि वपः सहस्रात्कं न पुरो जरिमा विदर्दः<sup>14</sup>

In Dashranya Battle six lakh, sixty six thousand and sixty six people of Anu and Druhiyu were killed and it was more formidable than the war of Kalinga of Ashok, the great. नि गव्यवोग्गपनवो दुह्यवश्च षष्टिःशताः सुषुपुः पट्सहस्रा । षष्टिवीरासी अधिषद् दुवीयु विश्वदिन्द्रस्य वीर्या कृतानि सहस्रा<sup>15</sup>

#### **4. The Ramayan and the Mahabharat Age:-**

In the Ramayan, killing of Bali who was keeping Sugriva's wife in captivity, by Ram with great hide and sick method can also be termed as homicide in modern concept of law, but in those days his killer Ram was highly praised. Our great sage Parasuram is said to have killed his mother. The murder of Bali and Sudra Sambrika by Ram, is another noteworthy instances of an individual murder for personal motives. The murder of Duryodhan by Bhima in a duel, killing of Abhimanyu by Jayadrath through unfair and objectionable means, of again Jayadratha by the great warrior Arjuna in revenge of his son's, killing of Karna by Arjuna and many other such stories of murder and killing abound with great Epics— the Ramayan and the Mahabharata. It shows that such murders got sanction of society on certain grounds and were accepted with full justifications.

In the primitive stage, law needed no enforcement. Generally people followed their duties instinctively and honoured the rights of each other, as says, the Mahabharata.<sup>16</sup> Certain strong general belief in- certainty of supernatural

punishment, was quite sufficient to prevent a breach of tribal customs or commission of frequent crimes.

In Padma Puran there is a mention of Brahman murder exoneration, by taking a dip in the river Godavari and drinking its water a person is released from the sin of Brahmin murder<sup>17</sup>. Homicide in the past was very common when we find a mention of Hiranyakasyapu, being killed in the Narayaniya Section of Mahabharata. In this later reference the reasons for killing are given though briefly "I shall kill Hiranyakasipu, son of Diti, because he destroys the sacrifice, which is for the benefit of gods" by assuming the form of the boar, the Man-lion or the dwarf etc. I shall kill the arrogant enemies of the Gods"<sup>18</sup>. In the Bhagwat Puran<sup>19</sup> Hiranyaksipu's brother Hiranyaksapu was slain by Vishnu in his Boar Incarnation.

In Malti Madhava<sup>20</sup> it is mentioned that to please Goddess Chamunda Devi there is a pathetic picture of human Sacrifice in a Tantrik context.<sup>21</sup>

#### **5. Age of Buddha and after (6th Century B. C. onwards):-**

It was in about 6<sup>th</sup> century BC or a little earlier, that the Indian Law began to attain codification. The Dharmasutra writers, taking Vedic traditions as their sources and honouring the views of Manu, laid the very foundation on which the structure of Indian law and criminal justice system was built. Kautilya, Manu and Yajnavalkya were in the first row to codify the then laws, devised in detail the methodology of punishing the offenders of various crimes, differently based, entirely, on the gravity of crimes. Narada,

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Brihapati and Katyayan further defined and elaborated them. It is mainly on the basis of the works of these law givers that we are enabled to present an account of crimes, laws and criminal justice system of the then society.

The sixth Century Bc. is the century of human enlightenment in the history of mankind. As the previous religious practices and ways of life did not serve the needs of the welfare and progress of all the members of their societies, the prophets and thinkers founded new religions and developed new thoughts by Lord Gautam Buddha (Buddhism) and Lord Mahavira (Jainism). Up to the sixth century Bc., the rulers of India fought among themselves to increase their own power without caring for the achievement of national and political solidarity. Consequently in the 6th and 4th centuries Bc. Indian territories were attacked and conquered by the Persians and the Greeks, the Indians failed to unite politically to defend the motherland.

Chandra Gupta (322-298 Bc.) attacked the mighty Nandas and after defeating the king, he killed Dhana Nanda. Asoka (273-233 Bc.) had killed his elder brother Suman in the war of succession<sup>21</sup>. In about 262 B.C. he conquered the state of Kalinga and in Kalinga war, Asoka became victorious after slaying about 1,00,000 (one lakh) soldiers of Kalinga army, captured about 1,50,000 soldiers, and thousands of civilians died in that war, a horrible slaughter of men, women and children, marked in eventful decision of the emperor of renouncing and relinquishing the warfare for ever<sup>23</sup>

The last ruler of the Mauryan dynasty was Brihadratha, who ruled kingdom of Patliputra during 191-184 Bc. He was a weak ruler and was killed by his commander in chief Pushyamitra Shunga, while reviewing his army in 184 Bc and by this the final end came of this mighty Mauryan empire.

There is a mention of killing of Grahavarman, the king of Kanauj by Devagupta, the ruler of Malwa (605 A.D. afterward). Rajya Vardhana became the ruler of Kanauj after the death of Prabhakar Vardhan in 605 A.D. but he was not destined to rule for a long time. His sister Rajyashri was imprisoned and her husband Grahvardhan, the king of Kanauj, was killed by Deva Gupta, ruler of Malwa. Soon after Rajya Vardhana waged a war with Devagupta and defeated him and then put him to death. Mean while, Rajyashri had managed to escape from the prison of Devagupta but Rajya Vardhan too lost his life due to the foul play of king Shashank of Bengal, who was a friend of Devagupta. Finally Harsha Vardhan ascended the throne of Thaneshwar and established a mighty empire and after getting a clue of Rajyashri in the Vindhya mountains, after great efforts, he succeeded in tracing out Rajyashri, who was about to put an end of her life in disgust by entering into a fire. He made Kanauj as capital of his empire and brought entire Northern India under his rule during (606 to 647 A.D.).

Kautilya's Arthasastra is a manual in the statecraft for the whole country and for all the times to come and he himself says, "the aim of the Sastra is to prescribe means for securing and preserving the earth"<sup>24</sup>

As regards its authenticity, Yajnavalkya and Narada hold the view that, case conflict between the two-Dharmastra and Arthashastra, the role of the former will prevail<sup>25</sup>. The Kamandaka Nitisara is a work by Sikhara with Sikhara-Svamin, a minister of Chandra Gupta-II, of the Gupta period, Abhu Saliha, an Arab Writer refers to the Nitisara of Kamandaka and has given its abstract in Arabic<sup>26</sup>.

Manu did not recommend widows to die with her husband's dead body but she should survive and lead a simple and chaste life. The custom of tonsure or burning the widows alive with their husbands appears to be unknown to him. Kullaka, a commentator on Manu, says that besides leading a celebrate life, a widow should not take honey, meat or fish etc.<sup>27</sup> Near about the 7th century A,D advocates of Sati Custom came forward in increasing numbers, who extolled it as the highest act of virtue for a widow. Angiras argued that the only cause, which religion prescribed for a widow, was that of Sati<sup>28</sup>. Medhatithi also makes a reference to this custom but he himself does not prescribe and says that it has no authoritative support. Vedic texts put a strict ban on suicide for women like men. Medhatithi observes "As in the case of men, so in that of women also, suicide is forbidden."<sup>29</sup>

Regarding prostitutes and clever harlots, Manu recommends very simple penance for even killing them.<sup>30</sup> Gautam also says that for killing a woman, who subsists by harlotry, no "prayaschitta" is necessary, simply eight handfuls of corn may be gifted<sup>31</sup>. Post-mortem offerings are also denied to them<sup>32</sup>. For killing a general women, Manu prescribes capital

punishment.<sup>33</sup> and declares it to be a sin also<sup>34</sup>. Killing of adulterous and bad women were prevalent in primitive days but Manu prohibits to abstain company of killer of even an unchaste women<sup>35</sup>. For killing even the adulterous women of any class, Manu prescribes prayaschitas for furifying oneself by giving in alms a leather bag, a cow, a goat or a sheep.<sup>36</sup> According to Manu, homicide was divided in to two kinds—non culpable and culpable and again each into two the former into justifiable and excusable and the later into unintentional killing and murder Such divisions are synonymous of our modern I.P.C. Crimes under sections 302 I.P.C. and 304 I.P.C. Homicides, committed for the prevention of forcible and atrocious acts of offenders, such as murder, arson, robbery, and house breaking at night and also by a woman to save her chastity from violent out laws, were recognised as the justifiable homicides.<sup>37</sup>

The other category of excusable homicide was in case of accidental deaths in which men are not responsible for killing because they have no control on the situation. It may be called involuntary or excusable homicide. Manu describes ten circumstances for road accident deaths, for which, neither the owner, nor the driver, nor the occupant of the cart, was held responsible for killing of living beings.<sup>38</sup> Such culpable homicide, unintentional killing of a human being, does not amount to murder, because out of two ingredients -intention and criminal negligence the first one is absent but the second one is present and in that case man responsible, is not totally, exonerated from punishment but quantum of punishment

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was mild like our present day I.P.C. and civil code. Manu devised punishment, individually, or collectively, to the driver, occupants or owner of the cart, depending on the circumstances - and evidence found by way of collective or individual fine, as per the merit of the case.<sup>39</sup>

For real violent homicide, Manu is very strict and advises kings for being strict and says "king who pardons such men (offender) perishes, and incurs hatred of the people."<sup>40</sup> He prescribes capital punishment to the killers of women, infants or the Brahmanas.<sup>41</sup> It does not mean killers of adults do not get capital punishment. Kautilya also prescribes capital punishment for female murderers and further says, that a woman, who murders a man, shall be drowned, but if she be pregnant, she should be drowned one month after the delivery. A woman, who murders her husband, preceptor, off-spring or poisons a man, shall be tom off by bulls. He also prescribes burning to death for any person who murders his father, mother, son, brother, teacher or an ascetic.<sup>42</sup> Yaznavalkya also approves the similar punishment.<sup>43</sup> Due to aggravation of disease for incompetence or negligence on the part of a physician, if a man dies, the middle most amercement is awarded. Kautilya, who prescribes the same punishment, in case of negligence of a doctor resulting in death.<sup>44</sup>

## **6. Human Sacrifices:-**

Accounts of human sacrifices are found in abundance in ancient history. There are many instances to show that the Phoenicians, the Carthagians, the Druids, the Scythians, the Athenians,

the Cyclops, the Lamai and the Lestrygons, the Formians, the Syrens, the Maenadis and Bacchae, the inhabitants of Cyprus, the Assiyrans, the Egyptians, the Jews, the Germans and the Norsemen, the Aztecs, (one of the different races of America, said to have been the most Civilised one, the Toltecs and the Tezcancans, the Incas the Peruvillors (South American), the Araucanians, the Pacific Islanders, the Mongols, the Dyaks of Boroneo, some South eastern Chinese and Japanese of the Middle Ages, the Turks, the Twiks, the Tibetans the Javanese, the Sumatrans and the Andamanese indulged in loathsome human sacrifices for eating the flesh of the captives or drinking their warm blood or for various other religions purposes<sup>45</sup>. Neither sex nor age offered any immunity to the unfortunate victims from their cruel doom. Whenever droughts prevailed, infants were sacrificed to the rain God, Teuloc among the Aztecs, khonds of western Orissa, sacrificed their meriah to the Earth -Goddess, Tari Pennu<sup>46</sup>. Practice of immolating wives, concubines and slaves at first —Originated from a mistaken belief of the next world and requirements of the dead there. The horrible rite of Sati and Jauhar must have originated from this feeling, later on in India in many cases as a devotion to husbands as voluntary sacrifices<sup>47</sup>. Persians were the only nation of the ancient times, which did not indulge in human sacrifices<sup>48</sup>. The ancient Hindus recognized the slaughter of human beings to appease, gratify and secure the grace of Gods<sup>49</sup>. The earliest reference to human sacrifice occurs in the Samhita of



Rig Veda, the story of Sunahsepha<sup>50</sup>. The Aitareya Brahman refers to an actual human sacrifice. The Ramayan, the Mahabharat, the Bhagwat Purana also reveal human sacrifices. In Apastamba Srouta Sutra (xx,24), a Brahman or Kshatriya performs human sacrifice where by he attains power and valour and all prosperity<sup>51</sup>. The Puranas recognize human sacrifices or Narabali to Goddess Chandika or Chamunda or Durga but prohibit the Purusamedha rite or Satrubali<sup>52</sup>.

The Rite of Narbali was widespread among the Hindus during the middle ages also and till the end of nineteenth century, it continued in some forms or others. The Gonds in Orissa generally used to Kidnap Brahman boys and keep them as victims to be sacrificed on various occasions. They were probably under the impression that the Brahman boys were representatives of a spirit or God<sup>53</sup>. Crooke notes that in Kathiawar, if a pond had been dug and would not hold water, a man was sacrificed. The Vedela lake in Bombay refused to hold water, then to please the local spirit, the sacrifice of the daughter of the village headman used to be done<sup>54</sup>. Human sacrifice was described to be a sin in Vanaparva of Mahabharata. In Dharmasastra a provision of a hundred cows to compensate a killing of a man, as sacrifice, is mentioned<sup>55</sup>. Frazer gives a somewhat -more horrible accounts of practice, prevalent among some of the Himalayan mountainiers, who put men to death, merely for the satisfaction of seeing the blood flow and of marking the last struggles of the victim<sup>56</sup>.

## 7. Brahmanicide:-

Killing of a Brahmin was regarded by almost all the ancient authorities as the greatest crime (Sin or Pataka). From Taitariya Samhita it transpires that India incurred great sin by Brahmahatya by killing Visvarupa and Indra was looked down upon as Brahmin killer.<sup>57</sup> In the Satpath Brahman.<sup>58</sup> it is mentioned that who-soever kills a Brahmin, he is guilty and is thought to strike Soma.<sup>59</sup> The Chandrayoga Upanishad (V.10.9) says killing a Brahmin is one of the five mortal sins (Mahapataka). Taitareya Aranyaka declares that slaying a Brahmin is truly murder and it can be expiated by performing a Aswavedhayagya. Gautam (21.1.) places Brahmahatya the top of sins (Mahapapya). Vasishtha.<sup>60</sup> uses the term "Brahmahatya" Manu (11, 54), Visnu Dh.S (35,17), Yajnavalkya.<sup>61</sup> enumerates five Mahapatakas of which Brahmahatya is one. Manu says "there is no sin.worse. than the murder of a Brahmin in the world. "A more heinous sin exists not in the world than murdering (killing) a Brahman. Let not a king even think of such a project -in his mind. According to Vas. Dh. S.<sup>62</sup> " an incendiary, a poisoner, and armed with a weapon, a robber, one who wrests a field or carries a way one's wife - these six are called Atatayin<sup>63</sup>. " आततायिनि चोतकृष्टे तपःस्वाध्यापजन्मतः वधस्ता तुनैव स्यात्यापेहीन बधो भृगुः ।," declares that no one should kill a Brahman, Who is eminent by reason of his tapas (meditation), Vedic study and birth, even though to be an atatayin ".The Nirukta (vi-27) enumerates the seven sins as theft, violating the bed of the Guru or receptor, murder of a Brahmana, murder of Bhruna, continual performance of sinful acts and telling a lie as to a sinful matter.

Later on sacredness of the person of a Brahman were on increasing in subsequent ages and the Brahmanas, irrespective of their virtues and voices were declared to be immune from capital punishment by the Dharmasutradkaras<sup>64</sup>. But there was a great inequality in awarding punishment and was entirely based on caste basis. The life of a Sudra or a Chandal was rather esteemed too low. Sudra could hardly claim justice and kindness even in his death at the hands of ancient law givers. Yajnavalkya<sup>65</sup> and Manu<sup>66</sup> include the killing of a woman, a Sudra, a Vaisya and a kshatriya among Upapatakas and gifts prescribed for killing these show that the life of the Sudra was not worth much and killing of a Sudra tantamounts to the killing of a cow, a crow, a chameleon, a peacock, a cakravaka, a frog, a dog, etc. Manu likens the killing of a Sudra to the killing of one thousand of vertebrate animals.<sup>67</sup>

### 8. Killing a Woman:-

Husband's right to punish the wife, even capitally, was universally recognized in the uncivilized society, and a life of a woman is viewed cheaper than that of a man. The ancient Burmese, the Muslims, the Gallas, the Rejangs of Sumitra, and some other countries held the same notions. In ancient India also, murder of a woman, unless she was with a child, was in the eye of the law at par with the murder of Sudra.<sup>68</sup> There were certain conditions in which woman's killing was declared serious. Gautam views that the killer of a woman in her menses, or a pregnant woman, in whom signs of pregnancy have not been fully potent, must practice the kind of expiatory penances prescribed for a

Brahmanicide<sup>69</sup>. Slaying a Brahmana woman, who is an Atreyi (One who has bathed after the menses, a synonym of rajasvala, according to the Amarkosa, or who is descended from the family of Atri,) was viewed a serious offence and was put at par with Brahmanicide<sup>70</sup>. But at the same time one should not feel that position of woman was low. Manu personifies woman with God and he says "Where woman is worshipped God dwells. ('यस्त नान्स्तु पूज्यन्ते रमन्ते तत्र देवता:'). But Manu prescribes lesser punishment for the killing of a faithless wife.<sup>71</sup> In later times the life of a woman came to be valued less and less.

### 9. Sati system:-

Origin of Sati system is disputed. General notion is that it came in to vogue in later Mauryan Period. But stray examples of this system are traceable in Vedic Age also. It came into existence in early life of Aryans. In Rig Veda one hymn describes this system as the first example of Sati system<sup>72</sup>.

“इया नारी रविधवाः सपत्नीराजनेन सर्पिंसा संविशन्तु ।  
अनश्रवो नपीवाः सुरला आरोहन्तु जनयोयोनिमग्ने” ।।

In another hymn it is described as follow.<sup>73</sup>

उदीप्यै नार्यभिजीव लोकं गतासुमेन भुपशेष एहि  
हस्तग्रामस्य दिधिषोस्तचैव पत्युर्जेनित्वममिसवभूथ ।

A lady is depicted as lying with the dead body of her husband, and there after, she is addressed to get up and stand up and once again come to this world. This description is according to some scholars, the first instance of Sati in Indian history.

In Atharva Veda also, we find a mention of this system in Atharva

Ved., 19.21. “इयं नारी पति लोकं- बृषानां निपद्यैते उपत्वा मर्त्यं प्रेतम् पुराण मनुषा लयन्ती तस्मै प्रजां द्रवोणं चेद्धृतम् ।।” A woman is trying to lie on the funeral pyre of her husband, and then after, she is directed to get down from the funeral pyre. It indicates the prevalence of Sati system in those days. In Taitareya Brahman Samhita also some instances are mentioned.

In Ramayan also we find a mention of a Brahmani Vedabati, being immolated on the funeral pyre of her husband.<sup>74</sup>

“एवमुक्त्वा प्रविष्टा सा ज्वलितं जातवेदसं प्रपात ।।”

On the death of Dasharath, Rani Kekaiyee is said to have made an attempt to die with her husband but it has not happened.

In Mahabharat Rani Madri committed burning on the funeral pyre of her husband Maharaj Pandu.<sup>75</sup> On the death of Lord Krishana's father Basudeva, all the four wives-Devaki, Madra, Rohini and Madura committed self immolation on their husband's pyre.<sup>76</sup> In Shanti Parva of Mahabharat, in a story of Kapot-Ka-Patani, Kapotani is described as committing Sati Pativerta Dharma after the death of her husband.<sup>77</sup>

पतिहीना तुका नारी सती जीवितुमुत्सहेत ।।

एवं विलप्य बहुधा करूणा सा सुदुःखिता ।

पतिव्रता सम्प्रदीप्तं प्रविवेश हुताशनम् ।।”

Greek historians too have given indications of Sati Pratha. Strabo has mentioned burning of ladies of Takshashila on the funeral pyre of their husbands. In Katha caste of the Punjab, it was customary for the ladies to commit Sati by burning on husband's funeral.

Kalidas has also described this system in his famous book “Kumarsambhava:-(4,33,35,36,45.)

In Vatsayan's Kamsutra, there is a mention of dancing girls giving false, assurances to their paramours of dying with them by committing Sati sacrifice.<sup>78</sup> Vrihaspati suggests “Sati” as a better way for the widows.<sup>79</sup> Vyas and Daksha have also suggested for widows to commit Sati as the best way of life.<sup>80</sup>

“दक्ष समृति भयंरिया नारी समारोहेद्दधुताशनम् ।

सा भवेत शुभाचारा स्वर्गलोक महीयते ।।”

When Sri Krishana died, Rukamini along with others had committed Sati.<sup>81</sup>

“अष्टौ महिष्यः कथिता रुक्मिणी प्रमुखास्तु याः ।

उपयुह्य हरेर्देह दिविशुस्ता हुताशनम्

Revti committed Sati when Balram died.<sup>82</sup>

“रेवती चापि रामस्य देहमाश्लिष्य सत्तमा ।

विवेश ज्वलितं वर्हि तत्संगाह लादशीतलम ।।”

## 10. Infanticide:-

In ancient period infanticide was a paternal power of father in China, Rome and many other tribes, and, races in India also. Among the savage and uncivilized tribes it was a usual practice to kill the infant, if it was a bastard, or if its mother died, or if it was deformed, or diseased, or if it was anything unusual, or uncanny about it, or if it was regarded for some reasons an unlucky child. Among many of the lower races girl-infanticide was practised at a whole sale rate, partly due to their economic hardships, and partly to avoid marriage expenses. Mother killed their new born infants due to, some-time, troubles and botherations in bringing them up, some time with the fear of loss of beauty due to long suckling time, generally extending to four years. Some time wives also induced their

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husbands to adopt this heinous course. Infanticide was also practised as a sacrificial rite. An interesting account of Somadeva, of advice of an ascetic to a woman, to kill her young son and offered him to the divinity, another son would certainly be born to her<sup>83</sup>. In Vana Parva of Mahabharata, the story of king Somak, who could hardly get one son, out of his one hundred wives, on advice, had sacrificed his son Jantu on a fire to get one hundred more sons, which he got from his wives after this sacrifice. Killing of first born son, or issue, had become a regular custom with certain peoples.

In some cases instances have been found in the past to kill infants for medicinal purposes and the victims of this practice were mostly females. This practice was in vogue in ancient Greece, Sparta, Rome, China and other nations, though it was prohibited both by Buddhism and Taouism<sup>84</sup>. But at the same time some restrictions were also put on such cursing customs. The "Garuda Purana" declares that he, who kills an unmarried girl, shall become a leper, and must be treated as 'Chandala', or low caste such as sweeper.<sup>85</sup> Manu also condemns those, who kill their daughters, married or unmarried. He, who kills his daughter, shall be sent to the hell, by the lowest region, filled up with blood and pus. He, who commits such sin, perpetrates the murder of a Brahman, which tentamounts to inflicting an injury on God. "Further he, who kills a Kanya (unmarried girl), shall have his abode in the hell of the fiercest region. "Srimad-Bhagwat Geeta chapter-x narrates the story of Kaunsa, Raja of Mathura, who put to death the newly

born' children of his own 'sister, and was, for that offence, put to death.

In Garga Samhita murder of Kanya (unmarried girl), is more heinous than the killing of a cow, or a Brahman. But in spite of ban on this ugly practice of infanticide, it continued at later stages also, and the Rajputs, before one thousand AD and after, were frequently killing their girl .-child just after birth. It has taken a form of virulous, despising and condemnably a cursing blot on humanity. It can be concluded that female infanticide, although, it was strictly prohibited by the ancient laws, continued to be practised by certain classes of Hindus, through out India, from Kashmir to the Bay of Bengal, and from Himalaya to Kenya Kumari.

### **11. Methods of Infanticide:-**

Methods, employed in infanticides, were suffocation, administration of opium, exposure and neglect of the babies, by disposing of the female infants. Want of adequate female education, was the main cause of this great evil. Sometime female infants were administered a few drops of asclepias-gigantea (a plant resembling milk, which produces poisonous effects and results in immediate death, without any chance of detection). There was a time, when female infants, (95 out of 100 cases), were murdered immediately after birth. But this practice was not only confined in all the districts of the Punjab but was also prevalent among the Jats, the Rajputs, the Kshatris, the Bedis and others. The Panth-Prakasha (History of Sikhism) also describes the evils of Kurimara, or female infanticide<sup>86</sup>.

## 12. Feticide:-

With the evil practice of infanticide, feticide also flourished, as an evil in ancient India, and, gradually, it increased with the advancement of civilization. The ancient knew less about it, where as the today's man, is using it at a high level. In olden days also, unwed girls used to adopt this course secretly, in order to, hide illicit sexual inter-course, escape punishment, shame and infame to the family, and it prevailed among the ancient Hindus, Muslims, Greeks and Romans. Narada categorizes it, as one of the ten Aparadhas (crimes), viz, disobedience of the king's order, murder of a woman, confusion of Varnas, adultery, theft, pregnancy from one, not the husband, abuse and defamation, obscenity, assault (Danda Parusya ) and abortion<sup>87</sup>. Manu and Vishnu vehemently condemn this practice.<sup>88</sup> Prescribes death by being burnt with grass (Kotagni) for those woman, who were confirmed adulterous, or who destroyed their fetus.

Yajnavalkya.<sup>89</sup> mentions that a woman, who killed her own child in the womb, or who murdered a man, may have a stone tided round her neck and be drowned, provided she be not pregnant at the time of the sentence.<sup>90</sup> Manu Yajnavalkya, Vashistha, Gautam and Apastamba further prescribe such "Bbhrunhan" (destroyer of foetus ), certain penances till death, but declare that such a person can never get rid of the loss of the right of association with the people, that there is no return for him to his relatives<sup>91</sup>. Practice of feticide was highly looked down upon with great disfavour and criticism, right from the age of Manu down to the middle ages and was considered to a very serious crime.

## 13. Investigation:-

According to Kautilya, all kinds of sudden death centers round one or other of the following cases, "offence to women or kinsmen, claiming inheritance, professional competition, hatred against rivals, commerce, guilds and any of the legal disputes, is the cause of anger, and anger is the cause of death<sup>92</sup>. "Kautilya describes the detention of criminals on suspicion and their thorough examination, interrogation, verification of their casts, name, relations with deceased, enmity, occupation, property and their other probable details to elicit confessions of guilt or clues to proceed ahead investigation. Application of torture is also prescribed while investigating. Men can speak lie, but place of occurrence or circumstances can not, was the view of Kautilya and so he laid stress on thorough examination of dead body, place of occurrence and that of the suspects for detection of crime. He views that many of the murders was committed by one hirelings, or thieves, robbers, or the enemies of a third person, personal motive mainly worked there and vengeance often was the root cause of all such crimes. "Those who called the deceased, who were with him, who accompanied him on his journey, and brought him to the seen of death, who saw any armed person lurking in the place and showing signes of troubled appearance etc. were also to be questioned and interrogated. Personal property, such as travelling requisites, dress, jewels or other things, which the deceased had on his body, while murdered, were also to be examined. Persons, who supplied or had something

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to do with those things, were also interrogated as to know the associates, residence, cause of journey, professionals and other calls of the deceased<sup>93</sup>.

Involvement of domestic servants in conspiracy, leading to the death of their masters, was also to be ascertained thoroughly. Deceased's relatives, if any, living a miserable life, or having some notorious tinge in character, a woman of suspicious character round the deceased or relative defending a woman of her deprived inheritance rights by the dead man, were to be earmarked and rounded up for thorough interrogation and examination. Love intrigues, property greed, domestic disputes and quarrels used to play dominant role in the commission of homicide even in those far off times, as of now.

Gautam also assigns the causes of homicides to the greed for wealth, food, beddings or attachment of one to another man's wife<sup>39</sup>. Yajnavalkya suggests enquiries on the point of deceased's longing for another's wife and possessions, and what kind of livelihood, he was having, and with whom, he had gone out<sup>95</sup>. Persons, living in the place of occurrence be gradually accosted<sup>96</sup>. The sons and friends of surreptiously murdered persons should be immediately and intensively accosted, if the deceased had any quarrel with any person, and if his wife had been visited by other persons.

#### **14. Post -Mortem:-**

Kautilya suggests detailed account of examination of the corpse of a man in case of sudden death. He suggests a post-mortem examination of the corpse. The

body is to be prepared by smearing it with oil, obviously with the object of bringing to light any means of violence or wounds. The condition and appearance of the body in the cause of death are indicative of resultant causes of homicide. If death is caused by strangulation, there is a swelling of the hands and feet, voiding of urine and stools, bulging of eyes, and marks on the throat. If, in addition, there is a contradiction of the arm and thighs, death by hanging is indicated. Closed eyes, a bitten tongue, and, a swollen belly, indicate death by drowning. Other causes are similarly described and it is mentioned that the officer must be very careful in his investigation, since a case of murder is often made to appear, as a case of suicide.

If poisoning is suspected, the remains of the last meal, eaten by the deceased, should be tested, or a part of his heart may be thrown in fire, its crackling sound or rainbow colours, indicating the presence of poison. It is further stated in Kautilya's Arthashastra that, a likely culprit in a case of poisoning, would be a servant severely reprimanded or thrashed by the deceased, or a wife in love with another, or a person hoping to inherit his property. Usual motives, in murder, are a woman, property, professional rivalry or a pending law suit. If murder is definitely indicated, investigation must be made to trace the murderer by questioning all those, with whom, deceased was last seen and those, who had dealings with him before his death. If, on the other hand, it is proved to be a case of suicide, investigation must be made to find out what led the person to commit it. Suicide was thought to be a sin and his dead body was dragged by

chandal on the highways and a kinsman, attempting to perform the obsequies was to be treated as an outcast.

### 15. Punishment (Dand) :-

Punishment is the action taken by the society against one who commits crime, an act by which one transgresses the written or unwritten laws of that society, the exercise of justice by the community of state of its representatives against the individual who breaks the laws of the society is primarily based on the feelings which underlie revenge. Punishment is, to a great extent, the revenge, vengeance of a person, or vengeance of the society, for acts of crimes, of individuals, in order to preserve the peace and order in the society. The criminals must suffer and must expiate their crimes. ;

Death sentence was the natural punishment for murder. If after a scuffle, death follows after some interval of time, the punishment used to be reduced. Death penalty was in different forms according to nature of crime. Skinning the head and then setting it on fire is the form of death for murdering one's mother, father and others. Tearing, as under by bullocks, is prescribed for the woman, killing her husband or some elder. Death by drowning is recommended for one who kills by poison<sup>98</sup>. Kautilya prescribes death sentence to the violators of a maiden of the same caste, who has not attained puberty in case of her death.

The Dharmasastras contain long lists of various crimes against society but they are more religious in nature and it is difficult to strictly divide a line between sins and punishable offences and many of

the offences were settled by religious penance. Another hurdle was cast based concept of crime and justice both, and was not based on the principle of equality of law or justice. Gravity of offences and awarding punishments differed entirely on class complex of the offenders as well as of the victims. A Brahman, abusing a Sudra, is condemned to no punishment, while a Sudra is subjected to severe corporal punishment, sometime amputation of tongue. One special feature of crime is that it changes with time and place. what is regarded as a crime by a particular society, at a particular period of time, may not be so, at a different time and for different people. Even in present day acts of homicides and genocide, of terrorists group in Jammu & Kashmir, are serious and heinous crime for the Indians, but they are termed by Pakistan Govt. as the acts of heroism, patriotism and bravery and the offenders killed, while committing such crimes, are termed as martyr or Sahid. Likewise in freedom movements of any country, even now, while committing murders or genocide, by offenders against the ruling classes are termed as offenders but they are taken as freedom fighters by the country struggling for liberation Brahmins were not awarded capital punishment in general but Kautilya prescribes death sentence to a Brahmin by drowning, in case, found guilty to foment disaffection or rebellion in forts, to incite wild tribes or enemies against king.<sup>99</sup> Brahmahatya was a grave offence and no mercy was shown to the culprit, whether he is a Brahmin or the Guru and should get capital punishment.<sup>100</sup>

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On humanitarian grounds immunity from punishment was given to certain category of persons, irrespective of casts. Yajnavalkya says, "an old man over eighty, a boy below sixteen, women and persons, suffering from diseases were, given half Prayaschitta"<sup>101</sup> Similarly a child less than five years commits no crime nor sin by any act and was not to suffer any punishment and not to undergo a Prayaschitta. Kautilya too was in favour of granting immunity to a minor from punishment.<sup>102</sup>

Ashoka, the great of Maurya Empire had abolished death sentence after the Kalinga war but generally during Mauryas and Guptas, the punishment was very severe. Death sentence was the punishment for murder of person, it could be death with torture, if the victim died on the spot. Painful deaths are prescribed for those who caused death with pain to a person Ashok emphasised on human aspect of the culprits also, and called upon the Nagara Vyavaharakas (city judges) to see that the torture or imprisonment should not lead to accidental death of the accused and so like modern times, proper care was taken to prevent custodial death and non-coercive method of interrogation of the accused. Junagarh Inscription of Skandgupta has given a detailed picture of capital punishment. Culprits were crushed to death by elephants as derived from Mudra Rakshasha<sup>103</sup>.

Manu lays down that a Brahman, intentionally committing any of the "Great crimes," shall be banished from the country, with all his belongings and men of other three castes, doing so, shall be put to death.<sup>104</sup>

Mensrea (criminal intention)" used to play significant role in fixing up an offence. Like modern law code, in the past also, wrongful acts done unintentionally and without criminal negligence, will not be a crime in those days also. Manu says "a person is criminally liable only for offences committed intentionally or out of gross (grave) negligence."<sup>105</sup> Like today for murder and any other crimes like adultery, fraud, impersonation, state used to conduct prosecution, even if the victim does not come forward with complaint and the victims or their near relatives used to be punished for suppression of crimes, and law did not permit anyone to come to a private arrangement with the offender, so as to condone the wrong for some consideration. In modern times in India the same methodology still exists and the state government does not allowed a crime un noticed if the complainant declines to register a case.

Like Manu, Yajnavalkya was also a strong supporter of this view.<sup>106</sup> In such case Kautilya prescribes a fine of five hundred Panas (4,12, 34). Section 201 of modern Indian Penal Code covers this offence and makes penal provisions for trying to temper with the evidence of crime.

Manu requires the state to do its best to apprehend the criminals at its own initiative and to bring them to justice even if no complaint was lodged by the victim.<sup>107</sup>

The death sentence was the supreme type of corporal punishment. It was carried out in various ways: beheading.<sup>108</sup> for those who corrupted royal ministers, slain women, infants, or Brahmanas, and, served enemy of king, cutting to pieces



with razors, implement preceded by cutting of hands,<sup>109</sup> drowning,<sup>110</sup> burning by fire,<sup>111</sup> devouring by dogs,<sup>112</sup> pouring boiling oil in the mouth and ears,<sup>113</sup>, inserting burning rod of iron into the mouth,<sup>114</sup>, trampling to death under the feet of an elephant.<sup>115</sup> and amputation followed by death.<sup>116</sup> for an offence of a man sexually violating an unwilling maiden was to be put to death after cutting off his penis.

The Mahabharata authorised subjects right to tyrannicide, if no other alternative left to them.<sup>117</sup> Many tyrannical kings were killed by the people. King Vena was one of them, though he pleaded this unviolability of his person on account of his divinity, the sages, who were exasperated by his wickedness and tyranny immediately killed him. Nahusa, Sudasa, Sumukha and Nimi were other tyrants who were assassinated by their subjects<sup>118</sup>.

Before inflicting punishment purity and truth of evidence and witnesses were kept in mind and in no case an innocent was to be punished. For deposing false evidences strict provisions were devised to punish them. Kautilya says "when a king punished an innocent man, he shall be imposed a fine twenty times the unjust imposition which he shall either throw into water, dedicating it to Varuna or distribute it among the Brahmanas."<sup>119</sup> Yajnavalkya also devised punishment to king in case of wrong judgement or punishment.<sup>120</sup>

## 16. Exceptions in Homicide Crime:-

Homicide, being denounced by the ancient law givers, they had prescribed certain exceptions in punishing the

culprits. Katyayana attaches no blame to a man, who kills wicked men, that are about to kill another, but, when, they have desisted from their attempt, they should be arrested, and, not killed.<sup>121</sup> Persons, about to set fire, or to kill, or they are in the act of setting fire, and killing, and the like, and that, where it is not possible by any other means to prevent, except by killing, killing is not an offence, but, when it is possible to prevent them by merely wounding than with a weapon, or stick, killing them would be an offence.<sup>122</sup> It is synonymous of provisions of modern Indian Penal Code, covering sections 99-105.

Medhatithi.<sup>123</sup> goes beyond the above prescription of Katyayan and provides provision to kill a desperado even after the commission of crime, besides killing, when committing offence. Mitaksara.<sup>124</sup> says that one has a right to oppose and kill another in self-defense, in defense of woman, and other weak people, who can not defend themselves against a murderous or violent attack, and in that, even if, a Brahmin is killed in exercise of this right, there is no punishment at the hands of the king, and the Prayaschitta (penance for killing a Brahman) is light one. If a driver (of a cart) kills a man by a rash and negligent driving, he is to be punished like a thief<sup>125</sup>. Vishnu Sanhita says that a man commits no offence by secretly or openly slaying one, who attempts to murder him, for such an action provokes his anger.<sup>126</sup> and such offenders as take up the sword to kill another, are one of the seven Atayins.<sup>127</sup>

Kautilya also prescribes certain astonishing exceptions and advises King to give concessions to such offenders. He lays down certain deceitful measures, by

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which a king can relieve himself of his seditious ministers. He suggests to employ some spys to instigate the minister's brothers on property disputes, and on provocation, if he kills his brother, he shall be put to death in the same spot under the plea and charge that he is a parricide.<sup>128</sup> He advises the same methods to be applied in case of a seditious Parsava (one who is begotten of a Brahman on a Sudra Wife), and a seditious son of a woman- servant. A spy may instigate a seditious minister on the issue of inheritance and while the claimant is lying at night at the door of the house of the seditious minister, or else where a fiery spy (Tiksua) may murder him and declare a hue and cry, and then by taking the side of the victim, may punish the seditious minister.<sup>129</sup> A spy may instigate the father of seditious minister and on the charge of parricide, he may be murdered.<sup>130</sup> A mendicant woman, having Captivated the wife of a seditious minister by administering such medicines as excite the feelings of love, may through that wife, contrive to poison the minister. He may be sent to fight a rebellion and may get him killed in that also.<sup>131</sup> While engaged in some sports outside the city, this king may honour them with accommodation near his own. A woman of bad character, under the guise of the queen, may be caught in the apartment of such ministers and then, they may be put to death.<sup>132</sup> The king may poison him through a doctor and hence so many deceitful devices and measures were suggested to the king to murder a non-patriotic and unfaithful ministers. (conspiring against the king, or the kingdom, and these offences were not in the purview of punishment).

The fact that Charudatta, a Brahman is being shown, having been condemned to death by the king Palaka in the famous drama *Mrichhakatika* (4th -5th century A.D.), fully indicates that the sentence of death against Brahmans, committing grave offences, was not entirely unknown or unheard of (*Mrichhakatika* by Sudraka, Act, ix) Many passages in *Jatakas* indicate execution of Brahmans<sup>133</sup>. According to P. V. Kane "the force' of popular feeling on the point of exempting a Brahmana offender from the death sentence, was so great that Elphinstone (Governor of Bombay) in Regulation - 14 of 1827 sect iv, clause 5 exempted Bramanas and women from death sentence even for murder, where public feeling would be shocked <sup>134</sup>." But from above narration it is also clear that exemption was never unanimous.

On the whole, it can be concluded that Hindu law givers, were, indeed, more successful in reducing the incidents of crime by ensuring satisfactory interdependent social relations among the citizens and in restoring to the community appreciable peace, harmony, tranquility and commendable public order. Laws, devised in detail the methodology of punishing the offenders of various crimes, differently based, entirely, on the gravity of crimes. Narada, Brihapati and Katyayan further refined and elaborated them. It is mainly on the basis of the works of these law givers that we are enabled to present an account of crimes, laws and criminal justice system of the then society. But from the above narration it is quite evident that laws were not equitable and in most of the cases justice was entirely based on Vama

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Vybastha and women, Sudras, Vaishyas were subjected largely as victims of the unjust laws, if viewed with modern parameter. For one and the same offence different people were differently punished. The mode of punishment and spirit of law were completely unjust and feudal in concept. The toiling poor people, who provided to the upper two castes, namely Brahmanas and Kshatriyas, food and means of subsistence, were in almost all the cases were dealt with great cruelty and inhumanely. Hence justice in those days was largely based on unjust foundations and larger sections of people kept on being exploited both by the state agency and the upper two castes through out the ancient period and they were almost treated worst than animals.

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# Are West Bengal Police Officers Stressed?

Dr. Sibnath Deb, Tanusree Chakraborty, Pooja Chatterjee and Dr. Neerajakshi Srivastava.

## Introduction

The stress response of the body is somewhat like an airplane readying for take-off. Virtually all systems e. g., the heart and blood vessels, the immune system, the lungs, the digestive system, the sensory organs, and brain are modified to meet the perceived danger. People can experience either external or internal stressors. External stressors include adverse physical conditions such as pain or hot or cold temperatures or stressful psychological environments such as poor working conditions or abusive relationships. Humans, like animals, can experience external stressors. Internal stressors can also be physical like infections, inflammation or psychological. An example of an internal psychological stressor is intense worry about a harmful event that may or may not occur. As far as anyone can tell, internal psychological stressors are rare or absent in most animals except humans. Stress-related conditions that are most likely to produce negative physical effects include:

- ★ An accumulation of persistent stressful situations, particularly those that a person cannot easily control. For

## Key Words :

*Police Officer, Stress, Symptoms of Stress, Consequences of Stress, Role Over-Load, Role Ambiguity, Role Conflict, Group And Political Pressures, Responsibility For Persons, Under Participation, Powerlessness, Poor Peer Relations, Intrinsic Impoverishment, Low Status, Strenuous Working Conditions, And Unprofitability.*

## Abstract :

*Police Officers play a significant role for maintaining law and order in the society. Sometimes they work under pressure and are stressed. The broad objective of the present study was to understand the level of psychological stress among West Bengal Police Officers. A group of 50 Senior Police Officers with at least 5 years working experience was covered and data were collected by using 'Occupational Stress Index' developed by Dr. A.K. Srivastava and Dr. A.P. Singh (1998) through self-administration method. Findings revealed that 14.0% of the Police Officers were suffering from high psychological stress. Further analysis of data revealed that the main areas of stress included un-profitability (22.0%), role overload (18.0%), role conflict (18.0%), powerlessness (18.0%), role ambiguity (16.0%), unreasonable group and political pressure (16.0%), intrinsic impoverishment (16.0%) and under participation (16.0%). Findings suggest that special attention is required for taking need-based measures for each of the above areas of stress for unburdening the level of stress among Police Officers.*

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example, high-pressured work and an unhappy relationship.

- ✦ Persistent stress following a severe acute response to a traumatic event such as an automobile accident.
- ✦ An inefficient or insufficient relaxation response.
- ✦ Acute stress in people with serious illness such as heart disease.

Job-related stress is particularly likely to become chronic because it is such a large part of daily life. And, stress in turn reduces a worker's effectiveness by impairing concentration, causing sleeplessness, and increasing the risk for illness, back problems, accidents, and lost time. Work stress can lead to harassment or even violence while on the job. At its most extreme, stress that places such a burden on the heart and circulation may be fatal. The Japanese even have a word for sudden death due to overwork, *karoushi*. In fact, a number of studies are now suggesting that job-related stress is as great a threat to health as smoking or not exercising.

The attitude that work is a duty and an obligation began with the early pioneers who settled this land. They believed that success and survival could be achieved only through cooperation, determination and hard labor. Gradually work as means of improving society was replaced by work as a means of enhancing own status and standard of living. With the birth of 'me' generation work has become yet another source of stress. As job stress becomes such a routine part of

our daily lives, relieving stress through changes in work habits, work environment, and work relations must be a key element in our overall stress management.

Just about any work situation can be potential source of stress. People's perception of the work situation determines the amount of stress he/she will experience and whether or not he will experience serious stress symptoms. Some of the common symptoms of physical, emotional and behavioural symptoms of stress are given in Chart 1.

Among the intense stressors at work are the following;

- ✦ Having no participation in decisions that affect one's responsibilities.
- ✦ Unrelenting and unreasonable demands for performance.
- ✦ Lack of effective communication and conflict-resolution methods among workers and employers.
- ✦ Lack of job security.
- ✦ Long hours.
- ✦ Excessive time spent away from home and family.
- ✦ Office politics and conflicts between workers.
- ✦ Wages not commensurate with levels of responsibility.

Police Officers play a very significant role for maintaining law and order in the society despite all the shortcomings and



**Chart 1 : Symptoms of Stress**

Physical Symptoms	Emotional Symptoms	Behavioural symptoms
<ul style="list-style-type: none"> <li>• Headaches</li> <li>• Twitching eyelid</li> <li>• Twitching nose</li> <li>• Facial or jaw pains</li> <li>• Dry mouth or throat</li> <li>• Difficulty in swallowing</li> <li>• Ulcers on tongue</li> <li>• Neck pains</li> <li>• Dizziness</li> <li>• Speech difficulties</li> <li>• Backaches</li> <li>• Muscle aches</li> <li>• Weakness</li> <li>• Constipation</li> <li>• Indigestion</li> <li>• Nausea/vomiting</li> <li>• Stomach pains</li> <li>• Diarrhoea</li> <li>• Sexual inadequacy</li> <li>• Chest pains</li> <li>• Insomnia</li> <li>• Accident proneness</li> <li>• High BP</li> <li>• Heartburn</li> </ul>	<ul style="list-style-type: none"> <li>• Irritability</li> <li>• Moodiness</li> <li>• Depression</li> <li>• Unusual Aggressiveness</li> <li>• Loss of memory</li> <li>• Nightmares</li> <li>• Withdrawal</li> <li>• Neurotic behavior</li> <li>• Anger</li> <li>• Thoughts of suicide</li> <li>• Feeling helpless</li> <li>• Impulsive behavior</li> <li>• Restlessness</li> <li>• Frequent episodes of crying</li> <li>• Indecisiveness</li> <li>• Lack of sexual interest</li> <li>• Periods of confusion</li> <li>• Racing thoughts</li> <li>• Anxiety</li> <li>• Feelings of panic</li> </ul>	<ul style="list-style-type: none"> <li>• Wrinkling forehead</li> <li>• High pitched nervous laughter</li> <li>• Nail biting</li> <li>• Compulsive eating</li> <li>• Increased use of prescribed medicine</li> <li>• Loss of interest in physical appearance</li> <li>• Compulsive dieting</li> <li>• Chronic procrastination</li> <li>• Sudden change of social habits</li> <li>• Chronic tardiness</li> <li>• Foot or finger tapping</li> <li>• Hair pulling</li> <li>• Smoking</li> <li>• Drinking</li> <li>• Drug dependence</li> <li>• Gnashing or grinding teeth</li> </ul>

limitations in the Police Department especially in regard to the infrastructural facilities, manpower and periodic training. Police Officers are supposed to implement all the criminal laws for which they work round the clock and/or without any leave/break, which cause tremendous mental pressure and physical exertion on them. As a result, sometimes a few of them may have violent outbursts and/or take leave without any prior notice. Police Officers are at high risk of being exposed to

psychologically straining situations and potentially psycho traumatic experiences.

A number of studies were carried out in different parts of the world for understanding the level of stress among Police Personnel. Green (2004) carried out a study among Police Officers with a view to ascertaining whether the Police Officers have severe post-traumatic stress than PTSD in civilians. No significant differences were found, although there was a tendency for higher

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use of alcohol and to try not to think about the trauma. Police Officers had more experiences of reliving the trauma or acting as if the trauma were recurring but, again, not to a significant degree. Yang (2004) found statistically significant difference in occupational stress and strain between doctors, Police Officers and teachers was statistically significant ( $P < 0.01$ ), and the score of the police-officers was higher than that of the doctors and teachers ( $P < 0.05$ ), but the personal resources of Police Officers were lower than those of the doctors and teachers ( $P < 0.05$ ). Further analysis of all items of personal strain revealed that the scores of vocational strain, psychological strain, physical strain, but not of interpersonal strain, were significantly higher in police Officers than in doctors and teachers ( $P < 0.05$ ).

Violanti (2004) explored suicide ideation in Police Officers and possible correlates associated with such ideation focusing on psychologically traumatic police work experiences, the development of posttraumatic stress (PTSD) in officers, and the inordinate use of alcohol associated with this condition. Results suggest that certain traumatic police work exposures increase the risk of high-level PTSD symptoms, which subsequently increase the risk of high alcohol use and suicide ideation. The combined impact of PTSD and increased alcohol use led to a ten-fold increase risk for suicide ideation. Violanti and Gehrke (2004) concluded that increased frequency and type of traumas, especially those occurring to other co-workers and those associated with gender, might eventually lead to a secondary process of emotional

compassion fatigue. Deschamps et al., (2003) found that Police from minority groups such as ageing subjects or police officers have been reported to experience greater stress. This population is adversely affected by lack of available manpower and long working hours. In fact sources of stress in the police population are found both in the weariness of the job and private life planning. Levenson and Dwyer (2003) reported that peer support component of law enforcement and other emergency services agencies has contributed to an increase in professional mental health referrals and a decrease in on-the-job suicides, sick days, and poor work performance. Furthermore, peer participation in debriefings following a traumatic event, and peer support during a crisis facilitates the process of psychological closure and mourning and enables emergency services workers to cope more effectively with tragedy so they can continue to perform their jobs efficiently and with satisfaction.

Pole et al., (2003) emphasized the importance of contextual threat and suggest that laboratory measures of startle improve upon self-reported exaggerated startle alone in indexing PTSD symptom severity in urban police officers. Collins and Gibbs (2003) confirm previous findings of organizational culture and workload as the key issues in officer stress. Given that the degree of symptomatology appears to be worsening, management action is required. Further research is indicated within the police population into a possible increased susceptibility in female officers. Literature review indicates that no such study was carried

out among the West Bengal Police Officers with a view to understanding their level of stress.

**Objective:**

The broad objective of the study was to understand the level of psychological stress among Police Officers with a view to suggesting need-based measures.

**Methodology**

**Sample and Sampling :** A group of 50 Police Officers from West Bengal Police with at least 5 years working experience was covered in the study following convenience-sampling technique

**Study Tool:** ‘Occupational Stress Index’ developed by Dr. A.K. Srivastava and Dr. A.P. Singh (1995) was used for achieving the objective of the present study. This scale aims to measure the extent of stress, which the employees perceive arising from various constituent and conditions of their job. The stress researchers have developed the scales which the stress arising exclusively from job roles (Rizzo et al., 1970; Pareek, 1981).

The scale consists of 46 items, each to be rated on the five-point scale. Out of 46 items 28 are ‘true-keyed’ and rest 18 are ‘false-keyed’. The items relate to all

relevant components of job life which cause stress in some way or the other, such as, role over-load, role ambiguity, role conflict, group and political pressures, responsibility for persons, under participation, powerlessness, poor peer relations, intrinsic impoverishment, low status, strenuous working conditions, and unprofitability.

**Data Collection:** Data was collected from the said group of Police Officers when they came to Kolkata for attending a training programme on *Child Abuse And Neglect*. Prior permission was obtained from the Additional Director General of Police (Training), West Bengal for the said purpose. The study was carried out in December 2004.

**Limitation:** The study was based on small sample. Another study with larger sample is suggested.

**Interpretation of Results**

Data collected from fifty West Bengal Police Officers using a standardized psychological scale entitled ‘Occupational Stress Index’ have been processed, analyzed and finally presented below for meaningful and logical interpretation of the same.

Analysis of the overall score as obtained from the study shows a mean score of 145.3 on a scale of 5 - 230; and a

**Table 1: The Distribution Of Central Tendency Measures And Deviation Among The Group Of Police Officers (N=50)**

Overall Score Range	Mean	Median	Standard Deviation	Kurtosis	Norm	Highly Stressed
5 - 230	145.3	140.5	26.4	1.20	118.89-171.75	14.0 %

standard deviation of 26.4, thus giving a norm of 118.89 - 171.75. Findings reveal that 14.0 % (7/50) of the West Bengal Police Officers were highly stressed.

Further effort was made to analyze the data domain-wise. Domain-wise nature of stress among Police Officers has been presented in Table 2.

**Table 2 : Domain wise Distribution Of Central Tendency Measures And Deviation Among The West Bengal Police Officers (N=50)**

Sl. No.	Domains of Stress	Mean	Median	Standard Deviation	Above Norm i.e., Highly stressed	%
1.	Role overload Score Range: 6-30	22.08	22	4.5	9	18.0
2.	Role Conflict Score Range: 4-20	12.8	12.5	3.5	9	18.0
3.	Role Ambiguity Score Range: 4-20	11.2	11.0	3.7	8	16.0
4.	Low Status Score Range: 3-15	8.4	8.0	2.8	5	10.0
5.	Un profitability Score Range: 2-10	6.8	6.5	2.0	11	22.0
6.	Strenuous Working Conditions Score Range: 4-20	13.1	13.0	3.2	5	10.0
7.	Intrinsic Impoverishment Score Range: 4-20	11.0	10.0	3.8	8	16.0
8.	Poor Peer Relations Score Range: 4-20	11.6	12.0	2.4	3	6.0
9.	Powerlessness Score Range: 3-15	8.3	8.0	2.4	9	18.0
10.	Under participation Score Range: 4-20	11.3	11.0	3.4	8	16.0
11.	Unreasonable Group and Political Pressure Score Range: 4-20	13.0	13.0	3.1	8	16.0
12.	Responsibility for Persons Score Range: 3-15	10.1	10.0	2.36	4	8.0

Analyzing the data inserted in Table 2 it has been observed that 22.0% Police Officers were highly stressed in the domain of unpredictability. Next in

order of intensity, it has been found that 18.0% Police Officers were stressed due to role overload, role conflict and powerlessness.

Sixteen percent of the Police Officers were stressed with respect to role ambiguity, intrinsic impoverishment, under participation and unreasonable group and political pressure.

Pertaining to role ambiguity 16.0 % (8/50) of the Police Officers were of the opinion that the job related information provided were too less and vague as compared to that required for effective functioning.

An equal percentage (16.0 %) of members were of the opinion that most of their opinions and suggestions were not much heeded upon; there was general lack of cooperation among members.

Sixteen percent Police Officers stated that they were needed to do some work unwillingly owing to certain group/political pressures. Even due to group pressures and need for greater acceptance in the group, they are required to work more than usual.

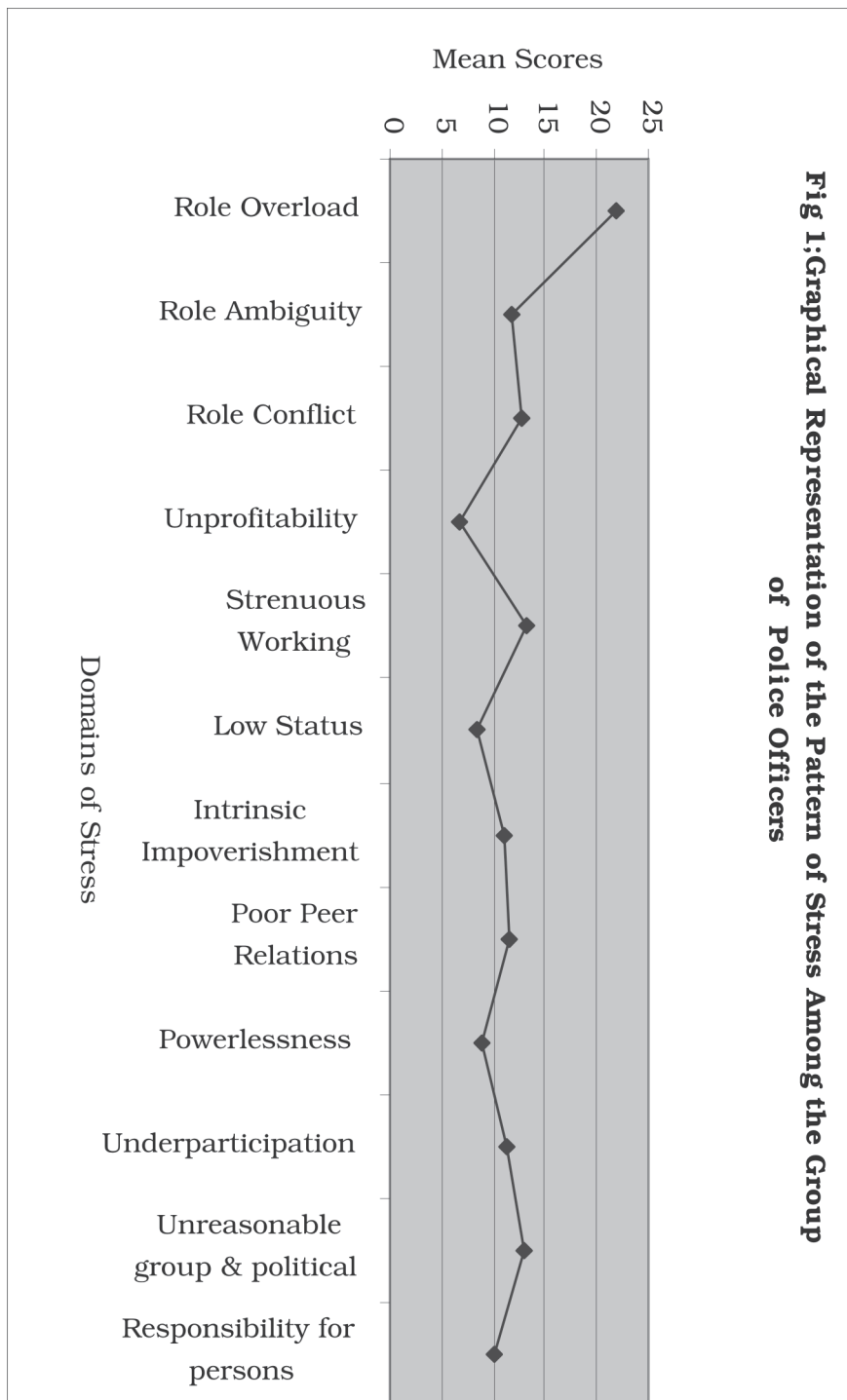
Another 10.0 % (5/20) of the participants find the working conditions were very strenuous. Circumstances were tensed for many; coupled with risky and complicated assignments to accomplish. Even they were found to assert that their job has made their life cumbersome.

Among the group of participants, 8.0 % (4/50) felt that their job accomplishment is interfered upon by the irresponsibility and inefficiency of productivity of others in the job with him. It acts as a thrust upon them to perform better. Even their responsibility for the future of other significant ones stresses him; furthermore they hold themselves responsible for the progress and prosperity of the organization.

Only 6.0 % (3/50) of the Police Officers felt that poor peer relations in the organization acts as a threat on healthy organizational membership. Thus, it can be interpreted that the group as has been found from the study is not much a stressed group. However results reveal that stress does exist among some 14.0% of the West Bengal Police Officers on various grounds. Graphical representation shows the pattern of stress experienced by the group of Police Officers in West Bengal (Figure 1).

### **Discussion, Conclusion and Recommendations**

In order to achieve the objective of the present study a group of 50 West Bengal Police Officers were covered. Findings revealed that 14.0% of them are highly stressed. Although the number is less, it is still a matter of concern for the authority and in order to confirm the findings of the present study another study with larger sample should be carried out. However, domain-wise analysis of stressor factors revealed that 22.0% of the Police Officers had a feeling that they get less salary in comparison to their quantum of outputs in the organization. Moreover, they were not rewarded sufficiently for the hard work done and performing all the undertakings efficiently. This is really a threat on the part of any organizational member. Everybody has an expectation in terms of rewards. Hence, it is suggested that reward system should be introduced in the Police Department to motivate the Officers to discharge their duties effectively.



**Fig 1: Graphical Representation of the Pattern of Stress Among the Group of Police Officers**

Further findings reveal that about 18.0% of the Police Officers were of the feeling that they are not given proper instructions about their job duties, their work is being interfered by senior officials, even working conditions are not very satisfactory from the point of view of employee welfare and convenience. Furthermore, the decisions taken by those members and instructions concerning distribution of assignments among employees, suggestions regarding training programmes are rarely properly followed. Thus a feeling of powerlessness exists among the Police Officers, adding to their occupational stress.

The Police Officers who are stressed due to role overload (18.0%), role conflict (18.0%) and powerlessness (18.0%) had a feeling that they have to do a lot of work in the job. Even they do not get the chance to perform their duties to their level of satisfaction, owing to excessive workload; they are sometimes required to dispose off their work hurriedly. The work pressure and demands are so high that this group of police personnel can rarely meet with their need for family matters and personal problems. They have to carry their job home owing to tremendous work pressure. Sometimes they are required to perform jobs, which are supposed to be done by others. Thus the concerned groups of West Bengal Police Officers are under excessive workload doubled with the difficulty of role conflict. The amount of stress among these men is thus high. Findings of previous study of Collins and Gibbs (2003) also emphasized on reducing workload.

The Police Officers who are stressed with respect to role ambiguity, intrinsic impoverishment, under participation and unreasonable group and political pressure stated that their job duties are monotonous in nature, lacks innovation and creativity. Work goes dull and dingy with many. They also do not get much opportunity to utilize their abilities the way they want to, independence is somewhat thwarted in their job specifications. There are fewer prospects to develop ones aptitude and proficiency. Chances for expressing self and giving suggestion in one's competent areas are also not much in practice.

There is a perceived lack of planning in jobs. One's jurisdiction and authorities are also not very well defined. They also add that the higher authorities and colleagues never delineate the type of work that is expected of them. About 16.0% of the Police Officers suffer a stress resulting from under participation. Under participation is naturally linked to feeling of under recognition and alienation. Hence, it is suggested to involve the Police Officers of all levels in decision-making process, which will in turn reduce the stress and help to develop a feeling of recognition in the Department.

Thus unreasonable pressure from group to perform more and demands from political institutions sometimes presses upon the individual resulting in job stress. In fact, this is unavoidable in Indian social set-ups since politicians are the main decision makers in every aspects of social structure.

The present study revealed one positive aspect among the Police Officers i.e., good interpersonal relationship

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among the Officers. Levenson and Dwyer (2003) found the positive impact of good peer group relationship and further shown how it helps each other to overcome some problems resulting from stress. Hence, sharing of personal and work problems with the colleagues is the source of ventilation of stress and strain among the Police Officers. .

Although only 14.0 % Police Officers were found to be highly stressed, it is a matter of concern for the authority in the Police Department to find out solution for the same to avoid any unwanted situation in future. The main emphasis should be given on the issues like role clarity, participation of the Police Officers in decision making process, introducing more group activities in the department. In order to motivate the Police Officers reward system should be introduced in the Police Department, which is practiced in the Customs Department. In the Police Department the recognition of the services of police officials is only for outstanding performance whereas the officers at the lower level of hierarchy also work hard and many times do great job. Recognition in any form of these officials will boost their morale and help in reducing stress related problems among the police officials.

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# Taming The Beast: Can Corruption Be Controlled?

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Estimating corruption in India is like the six blind men at different ends of an elephant. All agreed it was huge, but none was sure just how big. Rs. 30,000 to 50,000 crores is a conservative estimate of bribes paid annually. This is almost 2 % of the GDP and about 20% of total government revenue. If you add public funds misappropriated, the figure will probably increase several times. This will not startle anyone who has traveled over non-existent roads in some states, or looked for invisible rural schools. The late Rajiv Gandhi had remarked that only 15 paise of every rupee allocated for development projects was actually utilized, the balance being siphoned off at different levels. It is therefore not surprising that World Bank studies show that countries that tackle corruption can increase national income by 400% - the 'governance dividend'.

Everyone in India agrees that combating corruption is a national priority. A B Vajpayee as prime minister had called for 'zero-tolerance' against corruption. Prime Minister Manmohan Singh has called for a national consensus to help clean politics of the 'curse of corruption'. And efforts have gone beyond rhetoric. From the Santhanam Committee Report in the 1960's to the Vineet Narain judgment and the recently tabled Lok Pal Bill, India's highest

## **Key Words :**

*Corruption in India - 2% of GDP - CVC - CBI - CVOs - ACBs - Laws - hotspots - public - police corruption*

## **Abstract :**

*Corruption reduces India's growth by 3-5% annually. The highest institutions have condemned corruption, yet graft seems to be uncontrollable. This article reviews the architecture and laws to address corruption. It then calls for a coherent strategy, restructured organization and review of instruments. Constructing a Richter's scale of sleaze and focusing on 'hotspots' would make more effective use of limited resources. Consolidating and strengthening the CVO would yield better dividends. Enlisting the public and strengthening anti-corruption capabilities in the states are the keys to better results. Police corruption must be reduced to improve the governments image. Leadership, Training and Oversight are suggested means to achieve this. The feasible goal is to change the perception that corruption is low-risk and that anyone who isn't corrupt lacks either 'the opportunity or the guts'.*

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institutions have addressed the control of corruption. Why then, does this seem like the burden of Sisyphus, with most of us resigned to corruption as beyond redemption?

Similar to other social offences like prostitution, corruption is often perceived as a 'victimless' crime with both the giver and receiver benefiting. It could also be that more sophisticated investigating skills are needed to establish the chain of evidence needed to successfully prosecute a corruption case. Traditionally, the more obvious crimes against person and property were of greater concern while contemporary challenges of terrorism and organized crime are the current focus of policing.

In some respects corruption inflicts more damage on the nation than all these other crimes combined. It hampers development, condemning millions to a life of poverty and reduces India's potential rate of growth by at least 3-5% per annum. Moreover, poor governance is often the genesis of militancy particularly when youth despair of the future because of corruption. Extremist groups in some states actually sustain themselves on misappropriated government funds extorted as 'taxes'. Even organized crime groups have seen the huge opportunities in milking the vast sums being spent today in the infrastructure and social development sectors. The brutal killing of Satyendra Dubey, an official of the National Highway Authority who tried to expose the systemic corruption in the Golden Quadrilateral is evidence of the high stakes involved.

The objective of this article is to stimulate discussion on a subject that is rarely a policing priority. It briefly reviews the architecture of our anti-corruption machinery and legal instruments, and then discusses ways of increasing capabilities.

### **The Architecture**

The Chief Vigilance Commissioner (CVC) is the 'anti-corruption czar' in the *central government*. He heads the Central Vigilance Commission with the Central Bureau of Investigation (CBI) as its 'fighting' arm and Vigilance Offices (CVOs) in ministries and PSUs as supporting arms.

**CVC** The CVC Act that was passed in both Houses of Parliament in September 2003 is a direct result of the Supreme Court's rulings in the Vineet Narain case. Though provisions of the Act are less than many hoped, for the first time, the CVC has statutory status and judicial powers of a Civil Court. It has oversight over the functioning of the CBI and CVOs of central PSUs and selects CBI officers above SP including the Director. The charter of the CVC is primarily advisory and restricted to officials serving the central government. Its achievements have been impressive when evaluated against a strength of about 200 of which only 20-25 comprise the CTE that does technical evaluations.

It directly receives about 12,000 complaints from the public every year, though less than 5% are found suitable to be followed up. It also receives about 600 references from the CBI of which 20% are advised for prosecution. CVOs send over

3000 references that account for 80% of all cases referred to the Commission. Unfortunately, less than 0.5 % are found fit for prosecution. Recoveries of about Rs 20 crores are made annually on the basis of CTE inspections.

**CBI** The image of the CBI is as a nemesis of the corrupt. It is relatively small with just over 5000 personnel only part of whom are deployed for its anti-corruption mission. Its charter is limited, bounded by the framework of the Delhi Special Police Establishment Act that restricts original initiatives in the states, and includes operational controls like the 'single-directive' (now section 6 of the DSPE Act) that leashes investigation against senior levels in GOI itself. Nevertheless it has earned a well-deserved reputation, investigating about 800 corruption cases annually with over 300 arrests and seizures of property worth Rs 14 crores. The conviction rate is an impressive 60% of cases charge-sheeted. It is no wonder that the highest courts and even state governments call on the CBI to investigate complex and controversial cases.

**CVOs** There are about 186 full-time CVOs. Other organizations have part time CVOs. They deal with about 30,000 enquiries in all categories annually resulting in departmental penalties in about 8000 cases. Of the more than 3000 cases referred to the CVC only a very small fraction is found fit for prosecution but almost 50% are recommended for major or minor departmental penalties.

In the *state governments*, the primary anti-graft agencies are the Anti-Corruption Bureaus, Vigilance Bureaus and in some, a Lok Ayukta with an Investigation Wing.

**ACBs** Most states have Anti-Corruption Bureaus headed by senior police officers. There are as yet no established standards for the charter, authority and functioning of ACBs, nor benchmarks for performance. NCRB data indicates that total corruption cases registered each year in the 29 states and 6 UTs are about 3500. Over 3000 arrests are made annually and about Rs 8 crores property recovered, though only 500 convictions are obtained. States like Maharashtra register almost 500 corruption cases each year and arrest over 600 persons. Others like Bihar register 12 cases and arrest 5 persons. Among the smaller states Rajasthan registers almost 450 cases and arrests over 200 and Haryana registers about 300 cases and arrests over 300 persons. On the other hand Assam registers 11 cases and arrests 5. This data cannot be a basis for comparison of performance unless a deeper evaluation is made. Nor of course, can this data be interpreted to indicate a higher or lower degree of corruption in different states.

The common complaints of ACBs are lack of trained personnel, meager resources and ambiguity of mandate. There is not enough information to evaluate achievements of individual ACBs. In some states the role of the ACB is merely to conduct enquiries that are referred to it by government with authority neither to initiate enquiries nor even register cases for investigation on the basis of findings.

### The Laws

The *Prevention of Corruption Act, 1988* is the main legal weapon for anti-corruption agencies. The objective was to

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provide a more effective instrument than the earlier provisions in the IPC. The Act provides for Special Judges and has expanded the range of corrupt practices against which cases could be registered. Section 13 enables criminal prosecution in case of officials possessing disproportionate assets. Some provisions enable admissibility of statements from both the accused and bribe-giver. The penalties include minimum terms of imprisonment and fines.

The *Money Laundering Act, 2003*, passed by both Houses of Parliament is awaiting notification by the Union Finance Ministry. The P C Act is one of laws that will be within its purview. It seeks to declare laundering of funds a criminal offence, streamline disclosure requirements of transactions by financial institutions, confiscate proceeds of crime, and facilitate cooperation with other countries against offenders who have fled the country including attachment and confiscation of property kept abroad. A separate Tribunal and Appellate Tribunal are proposed, beyond which appeal would lie only with the Supreme Court.

Though not a law, in April 2004 the central government has initiated the first step for *protection of 'whistle-blowers'* or those who in the public interest wish to disclose corrupt practices. The CVC is the designated agency for addressing such complaints. The government notification applies only to central government organizations and excludes security organizations and the armed forces. The intention is to provide an avenue for

individuals, NGOs and even public officials who may want to expose corruption but for any reason don't want their identity to be known. However, the current practice of not entertaining anonymous complaints will continue.

The proposed *Lok Pal Bill* that is now being re-examined by a Group of Ministers is intended to widen the ambit of anti-corruption efforts to include those holding high political office. The Lok Pal is to be modeled on the 'ombudsman' existing in some Western countries. The office is expected to have statutory status and may have its own investigative arm or perhaps the CBI may be brought under its aegis. Similarly, the *Right to Information Bill* tabled in Parliament in December 2004 is expected to increase the transparency of working in central government organizations, reducing the scope for corruption.

### **What more can be done?**

What more can be done to make corruption a higher risk crime? More rigorous laws may not be enough – "*When mores are sufficient, laws are unnecessary. When mores are insufficient, laws are unenforceable.*" Countries like China have found that even extreme penalties like executing the corrupt are not by itself a sufficient deterrent. Creating yet more anti-corruption agencies or mechanically deploying more resources may also not significantly dent the graft juggernaut. Assuming that there are still enough right-thinking individuals in politics, among officials and the general public what can we do to turn the tide in the 'war on corruption'?

There is no 'silver bullet', though views are often expressed that if the CVC is empowered with the constitutional status and authority of the Chief Election Commissioner, honest and committed individuals could make a difference. Others feel that an institution like Hong Kong's Independent Commission Against Corruption would provide the muscle needed. The CVC itself has recommended that a Joint Parliamentary Committee akin to the Public Accounts Committee follow up its annual report that is tabled in Parliament. Many concerned individuals have shared their experience and ideas on what can be done to combat corruption. The essence of most of these proposals is the need for a coherent strategy, changes in organization, and fine-tuning of instruments.

First, greater clarity is needed on the where's and how's of corruption. We may dismiss ratings by (say) Transparency International that ranks India as the 71<sup>st</sup> most corrupt country out of the 102 surveyed. Similarly skeptics may question the World Bank finding that to start a business in India takes 88 days compared to 4 days in a country like the USA. Surely there is enough expertise within the country to compile acceptable estimates of the worst affected sectors and identify processes that facilitate corruption? This data can then be developed into workable intelligence assessments by agencies like the CBI. Resources can then be concentrated on these 'hotspots' as part of a defined strategy; legal instruments reviewed and strengthened as an on-going process, and most important, the 'silent majority' of the public pro-actively enlisted. A

pragmatic goal would be to create an environment that reduces the scope for and increases the risks of corruption, and to focus limited anti-corruption resources on the worst affected sectors. Such an approach would need a major transformation from the current focus on individual cases with intelligence capabilities remaining underdeveloped. A few of these issues are discussed below.

**Concentration of effort.** Surveys identify Customs, Excise, Income Tax, Defence Procurement, Central PWD, Industries, and Railways as 'hotspots' of corruption in the central government. Similarly under state governments, sectors identified are Commercial Taxes, Police, Regional Transport, Education, and Registration. Other surveys identify Health followed by Power and Education. Among PSUs, public sector banks and FI's are believed to have the greatest scope for corruption. The methodology is open to challenge. All of us in government know that despite arrests of officials at the highest level in these sectors, there are many more for whom integrity is an article of faith. Yet it is likely that deploying limited anti-corruption resources in 'hotspots' will have more impact than trying to spread the net over the vast government machine. As in fighting any crime, the practical aim is to deter potential offenders by increasing the probability of detection and prosecution.

The performance benchmark for anti-corruption agencies should be not just the number of cases registered or arrests made, but the value of corruption or fraud detected and government funds or illegal gratification recovered or confiscated. Examining concepts like

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'plea-bargaining' for corruption cases could reduce the long delays involved in trials that tie down resources disproportionate to the amount involved. A recent press item mentioned disposal of a case in court after 20 years relating to allegations of a bribe of Rs 100 taken by a railway TTI!

**Strengthening the CVO.** The CVO is already the main source of referrals (80%) to the CVC. Why not then let the CVC be the primary oversight authority for CVOs while at the same time strengthening this office? Instead of a dispersed structure with skeletal VO's in each PSU or department, why not a consolidated CVO for each of the major sectors like oil, steel, health, FI's, or defence procurement /infrastructure? These CVOs should report to the Union Secretary of the ministry concerned and not CEOs/HODs of individual organizations so as to reduce potential conflict of interest. At the same time, CVOs should be protected from arbitrary transfer and have functional and budgetary autonomy. The general supervision of CVO's should not extend to determining initiation of enquiries. At the same time, the Union Secretary should have the authority to task the CVO but not to determine the outcome of the report submitted. Any review should vest in the CVC. A CVO from within the organization is to be avoided. Instead, a person of known stature from another field should be preferred, with subject experts to assist him.

It is a fact that most organizations view the vigilance function as a nuisance and a cost burden that does not contribute to overall output. Expanding the charter at least for large

organizations could enhance this image and widen the CVOs interface with different functions within an organization. The expanded charter could include

- Preventing and detecting fraud, waste and abuse—an audit function
- Conducting investigations – a law-enforcement function
- Receiving and enquiring into complaints—conventional vigilance role

A consolidated CVO for larger sectors would enable separate wings for Investigations, Enquiries and the Audit as part of this broader Vigilance charter. For the Vigilance Office to be more acceptable, its mission must be perceived as more than just to uncover corruption. The Audit wing could help fight fraud and reduce costs, thus contributing to revenue. It would also aim to reduce vulnerabilities and improve controls in known high-risk areas. This expanded role would need closer interface with the CAG and developing of capabilities like forensic audit. On the other hand it would need to be given authority on behalf of the CVC such as asking for documents and summoning witnesses. The Investigation wing could investigate complaints ranging from bribery and kickbacks to false claims, and theft. A very close interface with agencies like the CBI or a CBI cell as part of this wing would be needed since investigative methods would need to be legally empowered to follow traditional investigative techniques viz. informers, undercover operations, surveillance and monitoring of communications appropriately authorized.

**Engaging the public.** The 'Tehelka' episode generated heated debate in official circles. Legally, no private person has the authority to set a trap for a corrupt official. But given the scale of corruption that has to be combated, it is vital to proactively enlist non-officials, whether media persons, NGOs or individuals. The 'whistle-blower' must be facilitated and encouraged. Some ways of doing this are

- 1) To organize a Special Enquiries Cell in the CVC or CBI and in selected CVOs that have the resources and skills to keep identities of whistle-blowers secret. Intelligence organizations and the CBI do this as part of their regular function. Perhaps an amendment to the PCA could give teeth to the promised protection to public-spirited citizens who often risk life and limb in exposing malfeasance.

Establish a 'Hotline' both toll-free telephone/fax and e-mail specifically for 'whistle-blowers' preferably at this Special Cell. This hotline can become an important avenue for reporting fraud, waste and mismanagement and will be useful in making intelligence assessments. There will be hiccups. Efforts at e tendering to break the hold of cartels in some PSUs, have in some instances failed to protect the identity of those who seek to challenge this monopoly. Sanjoy Ghosh lost his life because he publicized and attempted to break the unholy nexus that was siphoning off development funds for the poor. The murder of Satyendra Dubey prompted a look by the highest

authorities into the need to protect 'whistle-blowers'. There is a need to publicly honour these unsung heroes in the war on corruption.

- 2) Explore options like "qui tam" suits used in some countries. Anyone with sufficient evidence can sue for loss to the government, offering to make the government an aggrieved party. If the government agrees, it shares any costs incurred and damages awarded. Even if the government chooses not to participate, the suit can continue, with the government sharing neither costs nor damages awarded, this accruing to the individual/NGO. In some High Courts, PILs are already being used to highlight fraud and waste of public resources. This would only formalize and facilitate such efforts.
- 3) Use public broadcasting facilities like the radio and TV creatively to educate the public about local avenues to complain and methods to combat corruption. Publicize successful non-official initiatives like the Citizens Report Card in Bangalore or the Mazdoor Kisan Shakti Sangathan (MKSS) in Rajasthan. At the same time, highlight the social costs of corruption and successful actions against corrupt individuals.

**Strengthening anti-corruption resources in the states.** The battle for corruption will ultimately be won or lost in the states. It is here that the ordinary citizen faces the phenomenon most in

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everyday life. A systematic review is essential to identify the worst abuses and to provide central assistance to those states that are willing to move ahead. This is not merely giving ACBs more equipment and manpower or enabling use of investigative tools like monitoring of communications. Developing a clear doctrine, enhancing capabilities to meet given standards while evolving an organizational rubric that expands autonomy subject to reasonable oversight are fundamental changes needed. At every level citizens should be made aware that there are anti-corruption mechanisms. In some states ACBs are already tasked and provided expertise to identify and propose remedies for government processes that encourage corruption. This should be expanded and the media and NGOs encouraged to help expose corruption and spread information about anti-corruption innovations and best practices in other parts of the country.

Crime knows no boundaries, and to be effective anti-corruption agencies of the centre and states need to evolve mechanisms to develop joint strategies. The goal should be to share best practices, identify constraints and work toward achieving the close coordination that already exists for security and law-order challenges. The Biennial Conference of state ACBs organized by the CBI is the first step to achieving this. Similarly, existing mechanisms for intelligence and operational coordination with Ministry of Finance departments like Income –Tax or agencies like DRI and ED, need to be strengthened.

The central government funds projects in states amounting to tens of thousands of crores. It therefore has a definite stake in reducing fraud and corruption in utilization of scarce national resources. With the concurrence of the states, the CVC should be empowered to take cognizance of any complaint of fraud or corruption relating to use of central funds. MOUs for allocation of development funds should be so designed that the CBI can investigate such cases involving central funds without awaiting approval from the recipient states. Similarly, All-India Service officers should fall within the ambit of the CVC regardless of whether serving the central or state governments.

**Corruption in the police.** In corruption folklore popularized by Bollywood, the most visible symbol of corruption in the state machinery is the police. The scale and spread of police corruption is believed to be much higher now than earlier when higher ranks and Central Police Organizations were assumed to be honest. Today the arrest of DGP level officers on corruption charges relating to direct intervention in investigations, or demanding contract kickbacks or pay-offs for recruitment/transfers doesn't raise eyebrows. Public perception is that corrupt elements of Central Police Forces connive with smugglers and even with insurgents. Even the icon of anti-corruption, the CBI is not free from the taint of corruption especially since the stakes in sensitive cases is very high.

In monetary terms the scale of corruption in the police is possibly a fraction of what exists in sectors with mega budgets such as social



development, defence procurement or infrastructure that have the potential for 'grand' corruption. It is also true that where corruption is accepted as a way of life it is unrealistic to expect a separate 'police' culture. The difference is that police corruption often verges toward quasi-extortion, since victims are often faced with a threat of arrest or worse coercion. More than other government departments, police corruption has a highly negative impact on the image of the government's commitment to the 'rule of law' and probity in administration.

Why should the police be expected to have higher standards than other organs of government and what can be done to reduce corruption in the police? The colonial model was quite straight forward. The role of the police was to maintain order for the imperial power at a minimum cost. Within these parameters, there was little interference with the internal management of the force and police budgets were kept at shoestring levels. The highest level in the police was paid about 150 times that of the lowest constable and entry for Indians into these higher levels was restricted only to those from 'approved' backgrounds. Given the high salaries, social status and authority enjoyed, corruption was rare at levels of higher police leadership and looked down on. It was accepted that lower ranks would 'live off the land' within limits that would not negatively impact the image of the 'Raj'. The role of the colonial government was restricted, so avenues for corruption in other departments were far less than today.

Times have changed. The police in modern India continue to have a monopoly on the power of the state to arrest and invade the privacy of individuals or use force on its own citizens. Today the police have a far more dynamic interface with the public. There is far more awareness about public image reflected in mottos like that of the Delhi Police "With you, For you, Always". The salary differential between the highest and lowest police rank is about 1: 10. The profile of police leadership reflects the entire spectrum of social and economic classes, an achievement of the bold reservation policy charted by our founding fathers.

At the same time, the political leadership in some states have an unprecedented influence not just on police management issues like recruitment, postings and expenditure on logistics, but at times even operational decisions like deployment of force during law and order disturbances or pursuing investigations. An unexpected consequence of the vast quantum of funds allocated to sectors like socio-economic development in modern India is the emergence of a new breed of entrepreneurs whose primary skills are to milk the government machine of funds.

In this milieu, the police leadership needs to introspect on its own code of ethics and what is feasible to contain corruption within the force. The army recruits ordinary youth and by a combination of leadership and rigorous training aims to create an extraordinary degree of group bonding. In war it is this regimental culture that motivates

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ordinary soldiers to acts of heroism even to sacrificing their lives for the 'izzat' of the 'paltan'. Naturally this is neither possible nor feasible to replicate in the civil police where the functioning is far more individual oriented and interface with society much more intimate. But leadership and training can still make a difference. Some ways in which these two levers can be more effectively used to reduce police corruption are outlined below:

- **Leadership.** This problem needs to be openly addressed at highest forums like the all-India DGPs conference perhaps in consultation with the CVC. The goal is not to make senior officers feel that they have to pay for every cup of tea offered at police stations, or every personal phone-call made, but to evolve a pragmatic ethical code and concertedly focuses on increasing rectitude at all levels.
- **Training** This is the most impressionable stage in a police career. The goal should be to evolve a culture where corruption is disparaged. Also to generate peer pressure against passive acceptance of the so-called 'police culture' where corruption is seen as a way of life. Training courses at different levels should repeatedly reinforce this ethos. Systematic in-house discussions of specific instances of fellow officers falling from grace should be organized as well as interaction with personalities from other fields on the public perception of corruption in the police.

- **Oversight** Ideally, the CVC should have integrity oversight over all IPS officers whether serving the GOI or state governments. For other levels, the expanded CVO template outlined earlier in this article should be developed. That is, in the case of central organizations, an enlarged Vigilance Office should be established jointly for CPOs and the vigilance charter expanded to audit areas like effective use of resources to meet stated goals. The CVO should not be from the same state or central organization, this Office should be given sufficient resources and autonomy and submit a semi-annual report to the Chief Secretary or CVC depending on whether state or central organization.

## Conclusion

Is corruption 'an unbeatable foe'? Is it better to have 'efficient devils rather than sleeping angels'? Whatever the benefits of 'grease' in the short-run there is convincing research to show that unbridled corruption saps the vitality of any society or organization. It is not just idealism that should drive the crusade against corruption. It is pragmatism and patriotism. India is expected to be among the growth 'tigers' in the first half of the 21<sup>st</sup> century and finally break the vicious cycle of poverty. If we falter, it will not be because the Narayan Murthy's have failed to provide the driving impulse in their fields of enterprise. Nor can those reformers be faulted who are taking such bold decisions, sometimes at

considerable political risk to change the direction of India's economy. It will be because of us in government service who have chosen to abstain. For those of us in the police it will be an abdication of our role to help establish the 'rule of law' a crucial condition for sustainable development.

There is no need to despair at the apparent hopelessness of the task. It is not necessary to destroy the whole edifice of corruption to prevent it obstructing development. After all corruption is a global phenomenon with some estimates placing worldwide corruption at US \$ 1 trillion (Rs 5000,000 crores). What is needed is to change the perception that 'anyone who isn't corrupt lacks either the opportunity or guts'. Once 'changes in behaviour or perception reach a critical mass, suddenly a whole new reality is created'. At this point in India's 'tryst with destiny' it is not enough to be personally upright. Each and every one of us must join battle. At the end 'all

that is needed for evil to succeed is that good men keep silent'. The future will hold us accountable.

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# National Ballistics Imaging Database Management and its Applications in Indian Perspective

S.S. Baisoya\*

## Introduction

Proliferation of firearms usage is resulting in an increase in the firearms related crimes in the country. Moreover, the activities of the terrorists, naxalites, interstate criminals, serial killers, and the repeat offenders are also involving the use of firearms. Criminals generally commit many crimes in the different jurisdictions after an unknown span of time with the same firearm till their arrest with or without the recovery of firearm. Various types of firearms and ammunition are used by these criminals in the commission of crime and the fired bullets and cartridge cases are usually recovered from the scenes of occurrence. Use of the same firearm in these crimes is an invisible link in the normal circumstances. Hence the investigations are then started by the investigating agencies of the respective areas in an isolated manner due to lack of any visible clue between them. Thus, the crimes committed prior to the recovery of the firearm remain unsolved and unlinked in different jurisdictions though the fired bullets and/or cartridge cases are usually recovered from the scenes of crime. Many of these

## Key Words :

*Integrated Ballistics Identification System, Firearms Examination, Ballistics Imaging Database, Correlation of Images, Image Analysis Techniques.*

## Abstract :

*Firearms related crimes are increasing due to the use of firearms in the activities of terrorists, naxalites, interstate criminals, serial killers, and repeat offenders in the country. Criminals generally commit several crimes in different jurisdictions after unknown spans of time usually with the same firearm. These crimes are investigated by investigating agencies of the respective areas in an isolated manner due to lack of any clue between them. Many of these crimes remained unsolved and unlinked for an indefinite period. In addition, the increase in casework leads to overburdening the Forensic Science Laboratories in the country. This poses problems in effective examination and comparison of huge amount of exhibits with the traditional manual technique using comparison microscope. Further, as casework increases in the laboratories, there are less likely chances that two separate crimes committed by same firearm would be connected. CFSL Chandigarh, therefore, have taken an initiative and established facility of automatic examination and comparison of images of markings on fired bullets/cartridge cases using Integrated Ballistics Identification System. This is an automated system capable of image acquisition, signature extraction and correlation of images. Using this system, the laboratory is creating national ballistics imaging database of the images of markings on firearm evidences. As new images are entered, the system searches the existing database and comparisons are made for possible matches. Thus, the database will help in linking the previously unlinkable crimes committed with the same firearm in different jurisdictions. The present paper explains the various features of the national ballistics imaging database and its forensic applications in the Indian perspective.*

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crimes remained unsolved and unlinked for an indefinite period.

Presently it does not seem that the investigating agencies do have any mechanism to solve and link these crimes prior to the arrest of the criminal with or without the recovery of the firearm. Even after the recovery of firearm, if the criminal does not confess before the investigating agencies that he or she has committed such and such crimes, it does not seem possible to link these crimes committed by the same firearm. In addition, as the criminal activities are increasing, consequently, there is an enormous increase in the firearms related casework in the Forensic Science Laboratories in the country. This leads to overburdening the laboratories with the casework and poses problems in effective examination and comparison of voluminous amount of bullets and/or cartridge cases with the traditional manual technique using comparison microscope and with a given manpower. Further, as the firearms related casework increases in the laboratories, there are less likely the chances that two separate crimes committed by the same firearm would be connected.

The CFSL Chandigarh have, therefore, taken an initiative and established a facility of automatic examination and comparison of images of markings on fired bullets and cartridge cases, fired by different types of firearms including, pistols, revolvers, rifles and shotguns, using Integrated Ballistics Identification System (Figure-1). The system is based on image analysis techniques and capable of image

acquisition, signature extraction and correlation in an image database. Using this system, the laboratory is creating a national ballistics imaging database of images of markings on fired bullets/cartridge cases in order to link the crimes committed by the same firearm. Thus, the database will provide help in linking the inter-state crimes, previously unlinkable crimes and crimes committed with the same firearm in different jurisdictions after unknown spans of time. The present paper explains the various features of the national ballistics imaging database and its forensic applications in the Indian perspective.

### **Traditional Firearms Examination**

Every firearm has individual characteristics that are as unique to it as the fingerprints are to the human beings. When a firearm is fired, bullets and cartridge cases are expelled from it. During firing, the firearm leaves individual characteristics in the form of microscopic markings to these bullets and cartridge cases fired through it. The barrel of the firearm marks the bullet traveling through it, and the breech mechanism of the firearm marks the cartridge case. These markings are unique to each firearm and are substantially reproduced each time the firearm is fired and hence are called as the "firearms fingerprints". The individual nature of these markings is used to conclusively identify a specific firearm as to whether the firearm has fired a particular bullet or cartridge case. Hence, the ballistics identification is

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based on the examination and comparison of these individual characteristics. If firearm is recovered at the scene of crime, a test fire of the weapon is conducted and test bullets and cartridge cases are obtained for comparison. The crime exhibits recovered at crime scenes are compared with the test exhibits obtained from a test firing of the recovered firearm. The bullets and cartridge cases recovered at one crime scene can also be compared with those recovered at another in order to link the crimes committed by the same firearm.

The comparison of the bullets and cartridge cases is traditionally done by using the comparison microscope. Individual characteristic markings are searched on the crime and test bullets/cartridge cases manually and matched in the side by side comparison in a three dimensional view under the comparison microscope. Accordingly, the firearm examiner opines whether a particular bullet or cartridge case has been fired through a particular firearm or not. The bullets and cartridge cases are compared one by one to a vast inventory of recovered crime bullets and cartridge cases or test fired bullets and cartridge cases. The necessity of searching each bullet or cartridge case manually greatly reduced the amount of bullets and cartridge cases that could be examined by the existing manpower and in given time constraints. It makes the matches less likely. This technique is manual, tedious and time consuming. Moreover, the stress and eyestrain on firearm examiners slowed the process even more.

## **Automated Ballistics Imaging Systems**

### **Background and Development**

In 1991, Forensic Technology Division later became Forensic Technology Inc. (FTI) of Walsh Automation Inc., in Montreal, launched development of an automated ballistics imaging system called the Integrated Ballistics Identification System (IBIS) for comparison of the marks left on fired bullets and cartridge cases. This system was subsequently developed for the U.S. market in collaboration with the Bureau of Alcohol, Tobacco, and Firearms (ATF). In 1992, the Federal Bureau of Investigation (FBI) contracted with Mnemonic Systems Inc., Washington to develop Drugfire, an automated imaging system to compare marks left on cartridge cases. The ability to compare fired bullets was subsequently added to it. In 1992, ATF implemented an enforcement program 'Ceasefire', to address the firearms related crimes in the United States. In 1993, ATF leased a machine from FTI for installation in the ATF laboratory in Rockville, Maryland, and began exploring other uses of the technology. Since the IBIS and Drugfire were based on different specifications, ATF and FBI in 1996, acknowledged the need for the two systems to be interoperable. In the same year, the National Institute of Standards and Technology defined the minimal specifications for this interoperability. Accordingly, the manufacturers of Drugfire and IBIS made hardware and software modifications to their systems in order to achieve interoperability.

In 1997, both ATF and FBI pledged to work together in the best interests of the law enforcement agencies to address concerns raised regarding having two divergent and competing programs. Each agency pledged that it would make no modifications to their existing systems that would exacerbate the differences in the technology. They also agreed for the first use of the term "National Integrated Ballistics Information Network" (NIBIN) and, ATF agreed to stop referring to its ballistic imaging program as "Ceasefire", and the FBI agreed to stop using the term "Drugfire" for its program.

### **Existing Automated Systems**

Various automated systems are in use for automated examination and comparison in the different parts of the world. Drugfire and IBIS are the two main automated systems that can be used for acquiring, storing and analyzing images of bullets and cartridge cases. Both the systems capture video images of bullet striations and of the markings left on cartridge cases. These images are used to produce an electronic signature that is stored in a database. The system then compares this signature to that of another fired bullet or cartridge case or to an entire database of fired bullets and cartridge cases. Both systems have image matching algorithms. The system of IBIS is now used most often, and since the images are acquired in a reproducible way by a special kind of lighting, the ring light, this system will result in the best matching results. Other systems which are available in the market are the Australian system Fireball, the French

system CIBLE, German system GE/2 and the Russian system CONDOR and TAIS. These systems also use image-matching techniques. Several methods have been reported on the image matching and pattern recognition techniques for firearms identification in the literature.

### **Advantages of Automated System**

The automated ballistics imaging systems have the several advantages over the traditional manual firearms identification method using comparison microscope. The main advantage is that the automated system facilitates automatic examination and comparison of the images of markings on fired bullets and cartridge cases and provides platform to create a national ballistic database of these images. The other advantages are that the automated system: enables the firearm examiners to examine more exhibits in a significantly shorter time, provides the firearm examiners with an improved set of tools to perform examination more efficiently, reduces the amount of non-interpretive microscope time of the firearm examiners, increases the match rates over the traditional manual comparison microscope techniques, reduces open file manual searches for linking previously committed crimes at different times and different places with the same firearm, expands forensic analysis capability beyond laboratory premises, and solves evidence chain-of-custody issues since physical evidence remain in one place. Moreover the automated system serves as a repository for the forensic standard reference materials i.e. reference firearms, ammunition and general rifling characteristics.

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## **Imaging Databases in other countries**

The ATF has established a National Integrated Ballistics Information Network (NIBIN) in the United States. The NIBIN program was developed to work in concert with all of the ATF's firearms enforcement initiatives, to provide and use intelligence information collected on crime guns, and to assist investigators in identifying those criminals who participate in illegal firearms trafficking. The NIBIN network includes ATF-owned equipment that is operated by State and local law enforcement personnel, as well as a few units owned by States operated over the ATF network. The program mainly includes the development and maintenance of a database of ballistics images from crime guns. The database contains images of cartridge cases and/or bullets recovered at crime scenes, as well as cartridge cases and/or bullets from test fires of recovered firearms. Many other countries such as Canada, USA, Russia, Thailand, Taiwan, Hong Kong, Greece, Turkey, Venezuela, Israel, South Africa, Germany, Spain, Italy, and many others have installed the automated systems and are maintaining the databases of the crime guns. The States of Maryland and New York has gone a little further by establishing a statewide ballistics imaging databases for new handguns sold in those states. This type of database is often referred to as a reference ballistics imaging databases (RBID) or a legislative database. The State of California also conducted an RBID feasibility study.

## **National Ballistics Imaging Database**

### **Instrumentation**

The CFSL Chandigarh has established a facility for automatic examination and comparison of the images of markings on the fired bullets and cartridge cases using the IBIS Hub System, Brasstrax System and Matchpoint Workstation, installed and commissioned in the laboratory. The IBIS consists of Data Acquisition Station, Signature Analysis Station and Correlation Server, and the Brasstrax System consists of Acquisition Unit, Control Unit and Data Concentrator. All the components of the system are connected by means of a local area network. The system have a software control for all its components including customized microscope, video camera, image digitizer, specimen manipulator and a network of computers. On the main system, the server will control software correlation and database storage management.

### **Image Acquisition Modules**

The system has two image acquisition modules, Bulletproof and Brasscatcher. Bulletproof (Figure-2) acquires the images of land engraved areas from the bullets including damaged bullets and Brasscatcher (Figure-3) acquires the images of breech face, firing pin, ejector marks on center fire cartridge cases and firing pin on rim fire cartridge cases. The class characteristics of cartridge case such as caliber, firing pin shape and of bullet such as caliber, number of lands, twist direction and other associated



information are entered in the evidence case file. System has an automated control for exhibit manipulation, exhibit focusing, exhibit illumination and image magnification change. System acquires and saves a two-dimensional digitized image of the region of interest. To illuminate the bullet surface, system has two types of lighting, center light and baffled ring light. The center light travels along the optical axis of the camera, hits perpendicularly the surface of the bullet and helps in maintaining more standardized method of data entry. The baffled ring light provides ambient lighting to give the image a natural appearance. The combination of center and baffled ring lighting is used to create clear and sharp images during image acquisition and to reduce the variability caused by an oblique lighting system. For cartridge case the system has co-axial ring-light for firing pin and breech face and dual fixed fiber optic sidelights for ejector marks.

### **Signature Extraction**

The signatures are defined as unique, characteristic and reproducible mathematical interpretation of the digital images of bullet and cartridge case marks. Signatures are extracted from the original image in a background process. After image acquisition, original image is stored at the image acquisition module, and a compressed image is transferred to the signature analysis module. The bulletproof algorithm compensates for the deformities to the bullet, which might have occurred upon impact with the target. The system has two uniquely designed algorithms for

cartridge cases. For breech face and firing pin marks, the correlation algorithm calculates the angle of rotation and automatically provides the best match position for viewing candidates that are likely matches. For ejector mark and rectangular rim fire impressions, the correlation algorithm makes optimal use of the oblique lighting that emphasizes the details of the mark by using both the acquired images in the correlation process. After the image acquisition process, the images, signatures and all the associated information files are replicated to the server database. The dedicated server controls the storage and retrieval functions of the database.

### **Correlation of Images**

The correlation is defined as to compute a numerical representation of the degree of similarity between the images. As new images are entered, the system correlates the images with the images stored in the existing database. The system uses the class characteristics to reduce the number of elements in the database against which it will perform the correlation. The user also have the capability to generate a manual correlation request for a specific exhibit to enable them to change search parameters or associated information filters; and to perform an immediate search/ correlation when circumstances require it. After the correlation, a list of probable matches is provided to the operator to evaluate the correlation results for any high confidence candidate. The system then allows for a visual comparison of the reference exhibit against the identified test

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exhibits using the image analysis and comparison tools. The class characteristics and other associated information such as caliber, number of lands, direction of twist, composition, firing pin shape, and date of occurrence is not mandatory to the analysis. However, these filters are optimally used to narrow down the number of searches performed by the computer. The system requests a number of fields to be completed when creating a case exhibit file so as to maximize the correlation performance based on easily identified information. The system allows printing, saving and discarding of any comparison data after the search and correlation processes.

### **Image Analysis and Comparison Tools**

The system has two different image analysis and comparison tools, i.e. multi-viewer and side-by-side comparison. The multi-viewer (Figure-4) tool allows the system user to display the test samples from the correlation results in a number of ways and choose a specific image type to be evaluated. The user is able to screen the test samples from the multi-viewer and determine which exhibits should be evaluated further. The side-by-side comparison viewer is used to compare two high confidence exhibits in order to establish a confirmation of a match. The system allows to move exhibits up and down, right and left and to rotate them to visually compare the candidates. It also provides controls for individual contrast and intensity. The system also allows selecting images for side-by-side comparison at any time from the case maintenance menu, from the correlation

result list or from the multi-viewer. The system also allows to be pulled out for examination on the comparison microscope for visual confirmation. When a positive identification is established between two specimens, the firearm examiner has the authority to record it in the database.

### **Database Storage and Security**

The system has a relational database of the images, signatures and associated information developed on a well-established and standard platform. The database is fully compliant with the net communication protocol converter and the relational database industry standards. The automated imaging systems have capacity to store large number of images of markings of bullets and cartridge cases. The system has a well-defined database security protocols for identification and authentication of the users at different levels in the system. To access a database, a user must run a database application and connect to the database using a valid user name defined in the database. The application is determines each level that a specific user is authorized to operate it. The database security system offers different levels of functionality through the application for different user groups. Only the system administrator has full privileges over the application and to grant privileges to other users. The system database generates an operator identity so that the last change to a record will be associated with the system user responsible for it.

### **Network Capabilities**

The system is designed in such a way that it can be connected to the existing network communication lines. All the applications of the system use TCP/IP communication protocols. The system network capabilities are based on commercially available standards. The system network equipment is fully compliant with the industry network communication standards, such as ISDN, frame relay, and others. The system is compatible for a National Network. Its networking features include automatic correlation of a newly acquired exhibit image over a pre-defined geographical database, and ability to generate a correlation request performed on a database from any region of the country or to launch regional or national correlation for high profile cases. The system also has a provision to perform manual correlation requests against any site in a networked system. As part of the network, this privilege is controlled by each laboratory's system. Updates for all system common data is made automatically during the night through the national network, ensuring perfect synchronization of all sites. Request of images from any site, for comparison purposes, is possible with the national network.

### **Firearms                      Fingerprinting Program**

Firearms Fingerprinting Program is being initiated by the CFSL Chandigarh at national level to associate the State Forensic Science Laboratories with its National Ballistics Imaging Database. Under this program, the State

laboratories will be provided network connectivity with the National Hub established at CFSL, Chandigarh. State laboratories joining the network will need to have their own remote data acquisition station that will help them in establishing a network of their State level ballistics imaging database with the national database. Thus, the database will be of two types, National level database managed and maintained at the National Hub by the CFSL Chandigarh and the State level database managed and maintained at the respective State laboratories. The National Database will have the database of all the State laboratories in order to link ballistic evidence from crime scenes and linking one crime scene in a State to another. The CFSL, Chandigarh and State laboratories have, therefore, a crucial role in the success of the National network of the Ballistics Imaging Databases in the country. They also need to educate the law enforcement agencies on the importance of submitting firearm evidences for inclusion and search against the database.

### **Forensic Applications**

As a firearms related case comes in a laboratory, images of the crime exhibits are acquired if the firearm is not recovered, and if the firearm is recovered images of the test exhibits are acquired. These images are stored in the database of the concerned laboratory and a replicated copy of the images, signatures and demographic information will be sent to the National Hub. When a new exhibit image is acquired, a correlation request is automatically created and sent to the signature analysis station of the

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National Hub, correlated on its server and the results will be returned to the remote operator automatically. The networked laboratories will also be capable of generating a manual correlation request for a specific exhibit to enable them to change search parameters or associated information filters. It will enable them to search an exhibit against anything in the regional as well as national database or to perform an immediate search/ correlation when circumstances require it. The network of laboratories will permit the rapid comparison of the firearm exhibits used in crimes in one State with those used in crimes in another State. Thus, the database will provide help in linking the inter-state crimes, previously unlinkable crimes and crimes committed with the same firearm in different jurisdictions after unknown spans of time.

### **Discussions**

The Ballistics Imaging technology was designed for operation by a firearm examiner or a technician with or without extensive previous experience in using a computer. The operator must be trained to enter the markings from the crime scene bullets and cartridge cases. The automated imaging systems have capacity to store large quantities of images of markings of bullet and cartridge cases. Since the entire process is automated and takes about five minutes to complete entry of a cartridge case, and about twelve minutes to enter a bullet, the system can process comparisons very rapidly in seconds using current methods. Increased throughput and decreased turnaround

time will result in higher crime solution rates over the traditional manual examinations.

The IBIS comparison analysis system does not positively match bullets or cartridge cases fired from the same firearm; this must be done by a firearm examiner. The system, however, produces a short list of candidates for the probable match. When an image looks as though a match could exist, the firearms examiner examines specimens on a comparison microscope. Matches are usually found in the first five shortlisted candidates almost all the time, yielding a dramatic time savings for a laboratory's firearms examiners. Automated searches complete ballistic comparison analyses with efficiency never before seen.

In order to create a database of the images of markings on the fired bullets and cartridge cases, use of the following priority order for entering evidence into database can be set: bullet and cartridge cases evidence from crimes where no gun has been recovered, and testfires from guns seized during criminal activities or search warrants. It has also been determined that the higher the ratio of bullets and cartridge cases to test fires, the more successful a laboratory can be linking unsolved shooting cases. Also, the images of test fired bullets and/or cartridge cases of the crime cases previously examined in the laboratory and for which the test fired cartridge cases and/or bullets are with the laboratory can be acquired. All necessary data and associated information can be taken from their case files and stored in the database.

The program's success and ultimately its usefulness depend on the cooperation of the State laboratories. The joining laboratories must continue to enter firearm evidence into the computerized database in the form of test fires and recovered bullets and cartridge cases. As the database grows, the potential increases for identifications to be made, links to crime guns revealed, and investigative leads created. The program is an investigative tool that discovers links invisible to other investigative methods.

### **Conclusion**

The National Ballistics Imaging Database helps in effectively and quickly linking the crimes committed by the interstate criminals, repeat-offenders, gangster and serial killers, and thus reducing the number of unsolved crimes. The criminals who cross jurisdictional boundaries and commit crimes can now be detected and their movements can also be documented. The program directly assists the forensic science laboratories in fulfilling their mission to support the law enforcement agencies to solve violent crimes involving firearms. The national ballistics imaging database will undoubtedly have a widespread positive effect on the law enforcement community and a substantial negative effect on the law breaking community.

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Figure 1 : Integrated Ballistics Identification System Hub installed in CFSL Chandigarh

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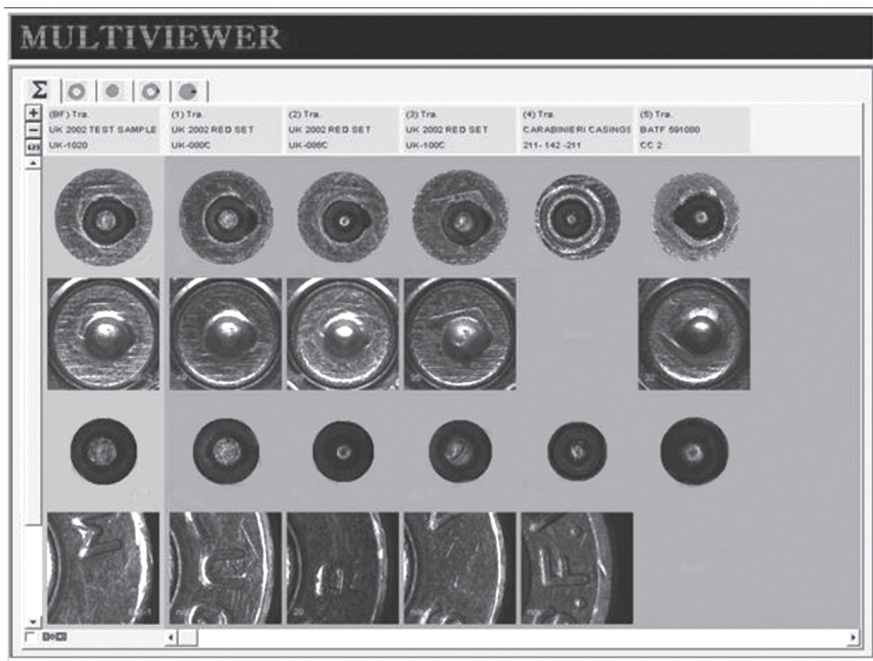
Phase	Phase Score	Peak Score	Reference	Test	Score
1	N/A	N/A	1	1	N/A
2	N/A	N/A	2	2	N/A
3	N/A	N/A	3	3	N/A
4	N/A	N/A	4	4	N/A
5	N/A	N/A	5	5	N/A
6	N/A	N/A	6	6	N/A

Reference: 1949  
Test: 2796

Figure 2 : Side by side comparison of the land engraved areas by the Bulletproof module of IBIS



**Figure 3: Side by side comparison of firing pin and breech face marks by the Brasscatcher module of IBIS**



**Figure 4: Multi-viewer tool for evaluating the reference and test cartridge cases in IBIS**



# Perceptions of Police Personnel about their Customer Orientation towards Women

B. Sandhya IPS\*

## Customer Orientation

Customer Orientation towards the downtrodden and needy sections of the society is the basic requirement if the police service need gain an image of a service-oriented organization. Women in India enjoy only a lower status in the society and they can be considered as a needy section of the society. The degree of Customer Orientation shown to women customers coming to the Police Stations will definitely show the degree of Service Delivery culture rooted among the police personnel.

Chris Moore (1978) explains about the customers that, the most important people in any business must be the 'customers'.

According to Robert L. Mathis and John. H. Jackson (1999) Customer Service begins with product design and includes interaction with customers, ultimately proving a satisfactory meeting of customers' needs.

Research findings of Santha Gopinath of Indian Postal Service (1980) reveal that the concept of 'Customer Satisfaction' is a synthetic idea of two distinct words, the customer and his satisfaction. In common usage,

## Key Words :

*Customer Orientation, Service Delivery, Perception, Grass Root Level, Cutting Edge Level, Middle Level, Women Customers, Crime Against Women (CAW)*

## Abstract :

*Customer Orientation towards the down trodden and needy sections of the society is the basic requirement if the police service need gain an image of a Service-Oriented Organisation. Women in India can be considered as a needy section of the society. In the present study, perception of police personnel about their own Customer Orientation towards women was measured, as 'mental models' created by individuals about organization affect the way in which they react to situations and orient themselves. The result shows that Grass Root Level personnel (Constabulary) paint the Department in brighter colours on Customer Orientation towards women, than the Middle Level and Cutting Edge Level personnel. Better interpersonal relations help to develop better perceptions. Police personnel themselves do not feel fully confident that they themselves would get a fair deal from a Police Station in a CAW case. Even then they do not perceive the urgency for further change in Customer Orientation and developing gender sensitivity. The study points towards need for the top management to give top priority to Customer Orientation towards women.*

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the word 'customer' means a buyer, one who purchases goods from another. Under the other possible connotations, the customer also means one who frequents any place of sale for the sake of purchasing or one who customarily purchases from a particular tradesman. Besides commodities, it also means the services generated or rendered by any agency for the benefit, use or welfare of the people or clients. Satisfaction occurs when one gets what one needs, desires, expects, deserves or deems to be one's entitlement. It manifests itself in the absence of a state of anger, pain, tension, all the way over to full involvement through stages of absence of irritation, annoyance etc. Orientation of the personnel towards the customers of the organisation can be defined as 'Customer Orientation'.

### **Perception**

Perception may be defined as the experience people have as the proximate result of sensory input. Perception is a very complex cognitive process, which gives a unique picture of a world that may be quite different from reality. The perceptual process involves a complicated interaction of selection, organization and interpretation. In simple words perception means how one views or looks at a particular thing. Numerous external processes such as work and working condition, supervisors, co-workers, pay and promotion, past experience, etc. are involved in formation of perception. In addition, there are internal cognitive process of registration, interpretation and feedback.

These are also 'Mental Models' which are deeply ingrained assumptions, generalizations, pictures or images that influence how we understand the world and how we take action. (Peter M Senge 1990)

### **The Study**

A research was conducted by interviewing the Middle Level Officers (Deputy Superintendents of Police and Circle Inspectors) Cutting Edge Level Officers (Sub Inspectors) and Grass Root Level personnel (Police Constables and Head Constables) of the Kerala Police with a view to study their Customer Orientation towards women coming to Police Station with criminal complaints.

#### **i. General Perception of Police Personnel About Customer Orientation in the Police Department**

There are reciprocal commitments between individuals and organizations. Human endeavors are bound by invisible fabrics of interrelated actions. 'Mental Models' created by individuals about organization affect the way in which they react to situations and orient themselves. It was decided to measure the perception of the police personnel about service delivery and Customer Orientation in general, so as to draw a 'mental model' of Customer Service in general, without any special reference to women. Such a general orientation is the prerequisite for developing Customer Orientation towards women.

In the interview schedule, a few questions were included to find out the general Customer Orientation of police personnel. In our interview with the

### Perceptions of Police Personnel about their Customer Orientation towards Women

police personnel, we found that 70.7% from the Grass Root Level, 78.5% from the Cutting Edge Level and 74% from the Middle Level think that the Police Department is giving top priority to fair dealings with customers and satisfaction of customers. The details are given in Table 1.1.

When the respondents were asked whether the superior officers are reviewing and checking satisfaction of customers during visits/inspections of Police Stations, 49.8% from the Grass Root Level, 54.6% from the Cutting Edge Level and 40.3% from the Middle Level told that the superiors are doing so.

When the respondents were asked if their personal motor vehicle met with an accident, do they think that they can go to the Police Station and get a fair deal, if the Police Station is not under their jurisdiction, 54.4% from the Grass Root Level, 66.2% from the Cutting Edge Level and 55.8% from the Middle Level replied positively. It is interesting to observe that 45.6% from the Grass Root

Level, 33.8% from the Cutting Edge Level and 44.2% from the Middle Level felt that they would not get a fair deal. More than 40% police personnel do not have confidence in the Police Department that they will get justice from a Police Station if they go with a criminal complaint. Though more than 70% of the police personnel think that the Department is giving top priority for customer satisfaction, only 60% feel that this policy will be translated into practice. The rest of the police personnel perceive that in practice, the customer may not get justice. This is in spite of the fact that 21.1% of the respondents are considering satisfaction of customers as the top most priority in their job, 19.2% are considering this as the second priority in their job and 35% are considering satisfaction of customers as the third priority in their job. The constabulary (57.1%) with less years of experience feels more that they may not get a fair deal. From the Cutting Edge Level also, the less experienced (60%) feel

**Table 1.1: Priority Given by Police Department to Fair Dealings With Customers**

Category	What priority does the Police Department give to fair dealing with customers and satisfaction of customers?			
	Top Priority	Average priority	Low Priority	Total
Grass Root Level	203 (70.7%)	82 (28.6%)	2 (0.7%)	287 (100%)
Cutting Edge Level	102 (78.4%)	27 (20.8%)	1 (0.8%)	130 (100%)
Middle Level	57 (74.0%)	17 (22.1%)	3 (3.9%)	77 (100%)
<b>Grand Total</b>	<b>362 (73.26%)</b>	<b>126 (25.5%)</b>	<b>6 (1.24%)</b>	<b>494 (100%)</b>

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that they may not get a fair deal. Among the Middle Level personnel, those with 20-27 years of experience (64%) feel that they may not get a fair deal. A case like a motor vehicle accident case is generally handled in the Police Station by constabulary or Sub Inspectors only. Those who handle such cases are having less confidence about getting a fair deal from their colleagues. On personal discussions, many respondents mentioned that their lack of confidence is due to corrupt practices in which their colleagues indulge. Many mentioned that corrupt practices are more in the case of motor accident cases, due to the nexus between advocates and police, in 'sharing the compensation amount'.

Thus though the police personnel in general stated that the Police Department is giving priority to customer service, when it came to perception about a specific ground level situation, around 40% do not perceive that they will get a fair deal from a Police Station. This shows that only around 60% personnel have confidence in the organization that customers will get justice from a Police Station.

## **ii. Customer Orientation of Police Personnel Towards Women: Perception of Police Personnel About the Police Department in General**

The perception of police personnel with respect to Customer Orientation of police personnel towards women was measured using a set of 14 questions with a maximum score of 100.

It is important to measure the perceptions of the police personnel regarding the Police Department as far as the Customer Orientation towards women is concerned. Perceptions are very important in determining priorities. One's perception about whether the Department is giving priority to women customers and whether the Department insists upon prompt investigation of Crime Against Women (CAW) cases etc may play a major role in deciding the urgency with which the police personnel develop Knowledge, Attitude and Good Practices in the area. The gap between Perceptions and KAP also can be measured to see whether there is any correlation between the two. Bridging the gap between the Perceptions of women customers and Perceptions of police personnel also is very important in improving the Service Delivery and image of the Police Department as well as in improving the satisfaction level of women customers.

## **iii. Measurement of Perception of Police Personnel Regarding Customer Orientation Towards Women and Analysis of Critical Strategic Issues**

The causes and factors (Critical Strategic Issues) contributing to the development of perception and their impact on Customer Orientation towards women are analysed in this section using the Perception Score the police respondents obtained.

The Perception Score of various categories of police personnel are given in Table 1.2

Perceptions of Police Personnel about their Customer Orientation towards Women

**Table 1.2: Perception Score of Police Personnel**

Category	Sample size (n)	Mean Score	Standard Deviation
Grass Root Level	287	65.8990	16.3318
Cutting Edge Level	130	71.7538	14.2149
Middle Level	77	60.1558	17.3274
<b>Total</b>	<b>494</b>	<b>66.5445</b>	<b>16.3605</b>

The Mean Perception Score is more for the Cutting Edge Level and least for the Middle Level. This shows that the Cutting Edge Level people have a better perception about the Department compared to the Grass Root Level and Middle Level. Cutting Edge Level people are basically responsible for decision making at the Police Station Level. These people have a better perception about the Customer Orientation of the Police Department.

By Analysis of Variance Test (ANOVA) F value obtained is 13.318 and  $P < 0.0001$ , which is statistically highly significant.

The Middle Level Officers are doing supervisory job. They are officers with sufficient experience in the Department. As the officers immediately above the Police Station level, they are the Officers who daily supervise and assess what happens in Police Stations. The findings are that they do not perceive that everything is all right in the Department. They tend to turn more cynical regarding the performance of the Department. The Score reflects their non-confidence in the Department. Cutting Edge Level people, the Sub Inspectors may be feeling more responsible for what happens in the Department. They are very well aware of the fact that they are the persons primarily responsible for what happens

in the Police Stations. Hence it is quite possible that they have more sense of participation in the affairs of the Police Station and they are better identifying themselves with the Department as a result of which they perceive Police Department in a brighter way. They are probably identifying the portrait of the Department as their self-portrait. They prefer to paint the portrait, naturally, with more perfection and in brighter colours.

The sense of 'belonging' to the Department is probably less among the constabulary. So the Perception Score is less for the constabulary, compared to the Cutting Edge Level. As the decision making power is less for the constabulary the sense of participation is also less for them in the affairs of the Department.

Perception is better for the younger personnel in the Grass Root Level. Perception Score is least for the older age group in the Middle Level. With increase in age, the Supervisory Officers feel that Customer Orientation of police personnel towards women is not up to the mark. Their understanding of the ground level situation is more and better understanding of realities has probably made them slightly cynical also and they do not perceive the Police Department with brightness.

#### iv. Perception and Punishment in Departmental Enquiries

The Mean Perception Scores of personnel punished in the Departmental Enquiries and those who have not been punished in any Departmental Enquiries are given in Table 1.3

By Independent sample t-test, t value is 1.401, with df 492, which is statistically not significant with  $P > 0.05$  (P Value is 0.162).

There is not much difference in the Perceptions of personnel punished in Departmental enquiries and those who have not been punished. Thus Departmental enquiries and punishment has not been significant in forming the Perceptions of the police personnel, about the Department.

#### v. Perception and Rewards Obtained From the Department

In efficient organizations, people are rewarded for effective performance. In inefficient organizations, reward system appears arbitrary and unrelated to effective performance that contributes to organizational goals.

The Mean Perception Score of Personnel who have been rewarded by the Department and those who have not been rewarded by the Department are given in Table 1.4.

Independent sample t-test gave a value of 0.657 with df 492. The difference is statistically not significant with  $P > 0.05$  (P value is 0.511).

Those who obtained rewards and those who did not obtain any reward are not showing much difference in their Perception Score. Thus rewards obtained did not play any significant role in forming the Perceptions of the personnel about the Department.

During personal discussions with a Focus Group of Deputy Superintendents of Police and Circle Inspectors, many expressed the view that those who are keen in getting more number of rewards pursue the bureaucratic hurdles and ensure that they get the rewards for the good work done in time whereas those who do not care for such things may not get rewards for the good work done. Many felt that even the highest rewards like the President's Police Medal, goes to

**Table 1.3: Perception and Punishment**

Have you been punished in Departmental Enquires?	n	Mean Perception Score	Standard Deviation
Yes	76	68.9605	17.5343
No	418	66.1053	16.1212

**Table 1.4: Perception and Rewards**

Did you get any reward in the Police Department?	n	Mean Perception Score	Standard Deviation
Yes	381	66.2808	16.8170
No	113	67.4336	14.7520

undeserving or mediocre personnel. Rewards never indicate excellence of an officer, according to most of the Focus Group Personnel. More over when the respondents were asked whether they feel that the Police Department is using rewards and punishment in a judicious manner to inculcate the spirit of gender justice among the police personnel, about one-fourth of the respondents reported that they do not feel so. Thus it is very clear that the existing reward system is not playing any role in formulating the perceptions of police personnel about the Customer Orientation of the Department.

Thus both rewards and punishments have ceased to motivate police personnel to inculcate a better perception regarding Customer Orientation towards women.

**vi. Perception and Support From Superiors and Colleagues in the Department**

Peter M Senge (1990) mentions that there is nothing more important to an individual committed to his or her growth than a supportive environment.

The Mean Perception Score of police personnel who felt that they get enough support from their superiors and colleagues and those who felt that they did not get such support is given in Table 1.5.

By Independent sample t-test, t value is 6.700, with df 492, which is statistically highly significant with  $P < 0.0001$ .

Those who felt that they got support and encouragement from the superiors in the career show better Perception about the Department.

This shows that better Interpersonal Relations play a positive role in forming of the perceptions of police personnel about the Department.

**vii. Perception and Support of Superiors and Colleagues During Personal Difficulties**

The Perception Score of police personnel who felt that they got support from superiors & colleagues during personal difficulties and those who felt that they did not get such support are given in Table 1.6.

**Table 1.5: Perception and Departmental Support**

Did you get support from Superiors and Colleagues?	n	Mean Perception Score	Standard Deviation
Yes	476	70.3229	15.8664
No	18	60.2675	14.3823

**Table 1.6: Perception and Support During Personal Difficulties**

Did you get support of Superior and colleagues during personal difficulties?	n	Mean Perception Score	Standard Deviation
Yes	442	67.2421	16.1192
No	52	60.6154	17.3377

By Independent sample t-test, t value is 2.782 with df 492, which is statistically significant with  $P < 0.05$  ( $P = 0.006$ )

Those who felt that they were supported by their superiors and colleagues during personal difficulties showed better Perception Score compared to those who felt that they were not supported during such occasions. This again reiterates that better Interpersonal Relations play a positive role in the forming of perceptions of police personnel about the Department.

### viii. Perception and Professional Freedom in Dealing With Customers

The Perception Score of police personnel who felt that they have got sufficient professional freedom while they dealt with Customers and those who felt that they did not have such freedom are given in Table 1.7.

Those who felt that they have got sufficient professional freedom to take a decision while they deal with customers show a slightly better Perception Score compared to those who felt that they did not have such freedom. But Independent sample t-test showed that the difference is not statistically significant, with t value of 1.371, with df 492.  $P > 0.05$  ( $P = 0.171$ )

The factor of professional freedom while dealing with customers is not significant in forming the perceptions of the police personnel about the Customer Orientation of the Department.

### ix. Perception Regarding Gender Sensitivity

When the respondents were asked whether the police personnel have become more gender sensitized in recent years, 48.1% from the Grass Root Level, 43.1% from the Cutting Edge Level and 29.9% from the Middle Level stated that police personnel have become gender sensitized recently whereas 37.6% from the Grass Root Level, 49.2% from the Cutting Edge Level and 67.5% from the Middle Level perceived that the police personnel have become gender sensitized to some extent recently. 14.3% from the Grass Root Level, 7.7% from the Cutting Edge Level and 2.6% from the Middle Level did not perceive any increased gender sensitivity among the police personnel recently. Many respondents perceive increased gender sensitivity after 1996.

The major reasons for increased gender sensitivity according to the respondents are mainly Government Policies and Departmental Circulars, followed by presence of educated women police in the Police Stations, and intervention by Women's Commission and other agencies.

**Table 1.7: Perception and Professional Freedom**

Do you have professional freedom?	n	Mean Perception Score	Standard Deviation
Yes	451	66.8559	16.0596
No	43	63.2791	19.1465



Those personnel at the Grass Root Level and Cutting Edge Level with more years of experience consider Government Policies as one of the major reasons for increased gender sensitivity. The personnel with less experience (4-11 years) do not consider training as important in this regard. This may be probably because they have not attended many in-service training programmes. Commitment of superior officers is the next reason, followed by training. Grass Root Level personnel see training as the least important reason for increased gender sensitivity. This points towards the fact that gender training is needed most at the Grass Root Level. This goes very well with the fact that only 9.8% of the Grass Root Level personnel have undergone gender training.

The importance given by the police personnel for Government Policies may be noticed. Police personnel give maximum credit to Government Policies in the field of increasing gender sensitivity. The perception of the police personnel, that Government Policies are most important in this regard points towards the need for a strong Policy Statement by the Government in the area of gender justice. If the personnel feel that Government is determined to follow the policy of gender justice, naturally they will give maximum importance to follow that policy in letter and spirit.

Majority of police personnel perceive increased gender sensitivity among the personnel during recent years. Whether they like it or not, they do perceive that change is happening.

#### **x. Perception About the Gender Sensitivity of Top Management**

John P Kotter (1995) mentions that most of the top managers in successful cases of major change learn to “walk the talk”. They consciously attempt to become a living symbol of the new culture. Kotter further states, “You do not expect that a 60 year old manager with 40 years of experience will suddenly behave in a Customer Oriented way. But I have witnessed such a person change a great deal. In that case, high level of urgency helped.”

In a Regimental Force, like the Police Force, the personnel give a lot of importance to the thinking of the top management. If the personnel feel that top management considers a particular topic as very important, others also try to fall in line. If the personnel feel that the top management is not very serious about any standing instructions, enforcement of any particular law or implementation of any Government Orders/ Departmental Circulars, all such laws, orders, instructions, etc. will be soon ignored and forgotten by all. The enforcement and practical implementation of any law/instruction will largely depend upon the enthusiasm of the police top management in its enforcement/implementation. Any type of crime not being reviewed regularly and any standing instructions not being discussed in the catechism classes regularly tend to be forgotten at all levels.

When the respondents were asked whether the Police Department has got gender sensitized top management to

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convey clear messages down for Customer Orientation towards women victims of crimes, 39.3% from the Grass Root Level, 47.3% from the Cutting Edge Level and 28.9% from the Middle Level responded positively. 49.5% of the Grass Root Level 47.3% of the Cutting Edge Level and 61.8% of the Middle Level felt that the top management is taking interest in this regard to some extent. 11.2% of the Grass Root Level, 5.4% of the Cutting Edge Level and 9.2% of the Middle Level feel that the top management is not gender sensitized to convey clear messages down for Customer Orientation towards women. The above statistics leaves much scope for improvements in this regard. It indicates that stronger messages based on conviction need to be passed down the levels, as far as Crime Against Women and behaviour towards women are concerned. If one-fourth of the police personnel do not perceive that the top management is committed towards satisfaction of women customers, it would be very difficult to expect from them that they would take keen interest in developing knowledge in the area as well as in adopting good practices in this field. This goes very well with ground level facts. There is a Circular in Kerala Police (Circular No. 11/96 dtd. 9-7-1996) that the Women Cell should supervise all the CAW cases and if the complainants have any complaint that such cases are not investigated properly the investigation of such cases should be reviewed by the Crime Detachment Deputy Superintendent of police. While the researcher, contacted four Crime Detachment Deputy Superintendents of Police regarding their knowledge about

this Circular, it was found that none of them were actually aware of such a Circular. As the Circular was issued in 1996 and the same was in disuse for quite some time, even the persons responsible for implementing the same forgot about the Circular. Similarly none of the Crime Detachment Deputy Superintendent of police contacted by the researcher, are remembering that there is a Circular that CAW cases should be reviewed monthly and report in this regard should be sent to the Police Headquarters every month for onward transmission to the Government. The Circular faced this fate because of its disuse. When top management is not committed to implement an instruction, the Circular containing the instruction is soon forgotten at each level.

The above findings support the views of John P Kotter (1995) that lacking a vision or under communicating a vision results in people not understanding, leave alone internalizing, the new approach. Until new behaviours are rooted in social norms and shared values, they are subject to degradation as soon as pressure for change is removed.

#### **xi. Actual Perception**

When it comes to perception about oneself and one's colleagues regarding the way in which they are routinely behaving while they are discharging their duties probably there can be a tendency to give normative answers. Hence while designing the Interview Schedule it was decided to ask a few questions on actual situation involving a personal matter. The respondents were asked whether they feel safe to send

their wife, sister or mother to a Police Station to file a complaint, if they had to face an atrocity.

83.6% from the Grass Root Level, 86.9% from the Cutting Edge Level and 74% from the Middle Level answered that they feel safe. 16.4% from the Grass Root Level, 13.1% from the Cutting Edge Level and 26% from the Middle Level told that they do not feel safe to send their wife, sister/mother to a Police Station to file a complaint. At the Grass Root Level, personnel with more years of experience are less confident to send their sister/wife to a Police Station with a complaint. At the Middle Level, personnel with more years of experience (28-35 years) are confident in sending their wife or sister to a Police Station to file a complaint. By and large years of experience is making marked difference in this regard among all levels.

When the respondents were asked about how will they send their wife, sister/mother to a Police Station if she has a complaint, only 24% of the Grass Root Level, 26.9% of the Cutting Edge Level and 16.9% of the Middle Level answered that they can go alone. 11.5% of the Grass Root Level, 2.3% of the Cutting Edge Level and 7.8% of the Middle Level answered that they will try to avoid filing a complaint. The others felt that they could go along with a friend, male family member, some influential person or they themselves.

From the above discussions, it is very clear that even among the police personnel, 17% think that a woman may not get justice from a Police Station. One reason may be that they do not have confidence that their colleagues will

deliver justice to women. Another reason may be that as they have not actually gone with a complaint, but have only imagined the situation, their perception is coloured by the general image of the Police Force as a not-so-Customer-Friendly-Organisation, especially towards women. As some of the police personnel do not like to send their close female kin to the Police Station, there is a possibility that such personnel may not accept the behaviour of a woman going to the Police Station and with such an attitude, they may look at their women customers. This is an example of a situation where personnel do not have confidence in their own organization.

When the respondents were asked whether they will get justice or not from the Police Station, only 27.9% from the Grass Root Level, 34.6% from the Cutting Edge Level and 15.6% from the Middle Level stated that they will get full justice. 0.3% from the Grass Root Level and 2.6% from the Middle Level stated that they would not get justice at all.

53% of the Grass Root Level, 53.1% of the Cutting Edge Level and 62.3% of the Middle Level stated that whether they get justice or not will depend upon the attitude of the SI/CI. Thus only one-fifth of the police personnel have full confidence in the Department that a woman in distress will get justice from a Police Station. Another one-fifth have no confidence, at all whereas about three-fifth of the personnel have confidence; provided police personnel are good, they exert influence etc. Years of experience is not playing any major role in forming the Perception of the police personnel in this regard.

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Even though they themselves are guardians of law, 8.5% of police personnel think that they will try to avoid filing a criminal complaint if their wife, mother or sister had to face an atrocity against her. It may be of interest to note that around one-fourth of the respondents thought that it is desirable that they themselves will accompany the female kin to avoid unpleasant outcomes. During personal discussions, many of these respondents said that they fear indecent behaviour from police personnel and they also felt from their experience in the Department that the delay and final acquittal from the Court are not going to give any solace to the victim.

Thus though majority of police personnel stated that everything is well in the Police Department with respect to Customer Orientation towards women, when it comes to an actual field situation, they are stating their actual belief that everything is not well and whether a woman customer coming to a Police Station will get satisfaction or not depends upon many factors like the nature of officers handling the case, the extent of influence the complainant can exert, etc. This is a situation where police personnel themselves believe that Service Delivery to women in a Police Station may not be professional, but may depend upon many extraneous factors.

### **Conclusion**

The result of the analysis can be summarized as follows:

1. The Grass Root Level Personnel paint the Department in brighter

colours on Customer Orientation towards women as they show more Perception about the Department and Middle Level personnel show the least Perception about the Department as far as Customer Orientation towards women is concerned.

2. Rewards and punishments from the Department are not playing any significant role in the forming of Perceptions of police personnel as far as Customer Orientation towards women is concerned.
3. Better Interpersonal Relations help to develop better Perceptions.
4. The police personnel in general do not perceive that the top management is giving top priority to Customer Orientation towards women revealing that, the top management has failed to convey to those under their charge that they give priority to CAW & dealing with women customers.
5. In general, police personnel feel that the present level of gender sensitivity is sufficient enough to deal with women customers and CAW in a fair manner. In other words, they do not feel any urgency to acquire more gender sensitivity.
6. By and large, the interviewed police personnel feel that police personnel have become better gender sensitized in recent years due to Government Policies, Departmental Circulars, intervention by other agencies, etc.

7. Police personnel in general, do not feel fully confident that they themselves will get a fair deal from a Police Station in a CAW case, i.e., they are not fully confident about the service delivery from a Police Station towards women customers or to customers in general. This is in actual contradiction to their Perceptions mentioned as point No. 5 & 6 above, i.e., in point No. 5 they perceive that they have adequate perception about their role in CAW while in point 7, they admit that what they could expect from their colleagues in Police Station will be different from what is contained in gender sensitivity programmes.

Thus it can be concluded that the police personnel have started breathing the air of change as far as gender sensitivity and service delivery culture in general and Customer Orientation

towards women in particular are concerned. At the same time, they do not perceive the urgency for further changes, in spite of the fact that they perceive the inadequacy in the Service Delivery of the Department to women customers.

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# Book Review

## **Manners and Etiquettes**

The book "Manners and Etiquettes" written by Dr. G.P. Bhatnagar, IG, BSF (Retd) and forward written by Sh. Ajai Raj Sharma, IPS, DG, BSF (Retd). The book published by M/s M.B. Publication in association with Learning Wheels, Maharajpur, Gwalior (M.P.). Book Contain 126 pages and its price is Rs. 150/- and reviewed by Shri R.C. Arora, IG/ Director, BPR&D.

It is Second Edition of the book authored by Dr. G.P. Bhatnagar, a retired IG of BSF. It extensively covers the Manners and Etiquettes which are observed on different formal and informal occasions in various societies. It is one of the tool which one needs to have mastery over to bridge the gap between one's potential and achievement level.

The book highlights the need for and importance of manners and etiquettes appropriate for different occasion. The illustrations are to the point while the expression is very convincing. Tips like "Grace will last, favour will blast." "Learn to listen than listen to learn." "Good manners are small coin of virtue" etc. appeal the readers at the very first reading.

The book is a valuable compendium of such manners and etiquettes as shall add grace to the occasion and conduct of the individual alike. The knowledge of contents of the book and its conscious practice over a short period can do wonders for the public servants frequently in touch with people in general and the police officers at the cutting edge level in particular. Its introduction in training institutes and

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regular practice during the training programme has powerful potential of grooming the officers of the Police who constitute public face of the Police Department. Therefore, it is strongly recommended for all Police Libraries and Training Institutes.

## **2. Nagpur Police Through Ages-A Micro Study in Macro Setting.**

The book, "Nagpur Police Through Ages – A Micro Study in Macro Setting", appears to have been written after a through research. In the first chapter, the author begins the sojourn through the ancient and medieval ages in order to allow the reader to have a glimpse of the ancient and medieval police traditions. The author, Mr. Joshi, has thrown light on the police tradition during the Pathan rule, Mughal rule, as well as the Peshwa rule by taking generous assistance from various historical works related to the Medieval Age.

The second chapter of the book on Bhonsle Raj gives few unnecessary details about the administrative structure of the Bhonsles – details about kamavisdars and the courtyards could have been avoided. The third chapter of the book gives a fair idea of the nature of offences, as well as the nature of convictions in and around Nagpur during British superintendency.

The fourth chapter mainly deals with the political history from 1826 till 1853. Though this chapter is supposed to deal with police administration from restoration of the territories of Raja till annexation, it appears that too much of political history has been dealt with in this chapter. The fifth chapter throws

interesting light on the changes in police organization in British India, as a whole though the emphasis was on Nagpur Police.

The sixth chapter of the book deals with the evolution of Nagpur Police. The formation of the Railway Police, Spl. Armed Force, the Spl. Branch and the origin of imperial police are beautifully brought out in this chapter. The seventh chapter outlines the organizational changes in Indian Police. The establishment of the C.I.D. and the C.I.B. has also been dealt with in this chapter.

In the eighth chapter on the history of police from 1919 to 1945, the author draws the attention of the reader to the various historical events taking place during this period and shows the police response to all such events. Certain interesting facts and figures related to pay & conveyance allowance can also be found in this chapter. The origin of the Spl. Armed Constabulary in 1941 as well as the establishment of night schools and training schools for constables have also been referred to in this chapter.

In the penultimate chapter of the book, the author refers to the various political developments as well as the important contemporary issues facing police from 1944 to 1956. In the final chapter with the title 'Epilogue', the author stresses the journey of nagpur Police since 1956 till 2003. Annexure I of comparative crime statement of nagpur city (1959 – 2003) makes interesting reading. There is an elaborate

bibliography at the end of the book and an index has also been attached for the benefit of the readers.

Though the book gives a vivid picture of the different phases of transformation undergone by the Nagpur police during the ancient, medieval and modern ages, the book could have been made more interesting had there been more illustrations and by doing away with some of the unnecessary and irrelevant historical details. On the whole, the book should be useful for anyone interested in knowing a bit more about the history of Nagpur Police as well as the evolution of the police system in Central India during the British Raj. Many will not miss the bold decision of the Maharaja of Darbhanga as a member of the Fraser Commission to give the dissenting opinion that the pay and recruitment procedure of the Indian Police Officers and British-born police officers should be equal though this opinion was finally rejected by the Second Police Commission.

This book may be considered not only as a review of historical evolution of Nagpur Police but also of the police force of Central India as a whole. The painstaking research undertaken by the author in writing this book is commendable indeed.

**Note:** For more details may be contacted to Sh. P.L. Joshi, MA, Ph.D, Rambag Complex Bunglow, Ramkrishna Nagar, Khamla Road, Nagpur - 440015. Ph.: (0172) 2224813

## From the Desk of Director (R&D)

BPR&D has sponsored a study on the **Use of Forensic Science in Investigation and Trial of Criminal Cases**. It was conducted by The West Bengal National University of Juridical Sciences. The study report has been submitted on 30.03.2005. Dr. Amiya K. Samanta, DGP (Retd.), West Bengal was kind enough to make a presentation respecting the findings of the study before a gathering of Senior Officers from LNIN NICFS, CBI Academy, Directorate of Forensic Science, CFSL, CBI and other distinguished Police Officers. We are pleased to reproduce some of the views and findings of the studies in the succeeding Para.

The study was based on the Critical evaluation of forensic evidence collected and used in recently tried out 115 cases of murder and rape which includes 100 cases, which came under the scrutiny of the Supreme Court on appeal. Endeavour was made to suggest on better utilization of existing resources to bring about qualitative improvement in the collection and analysis of forensic evidence. Efforts were made to find out reasons for inadequate use of forensic science in criminal justice processes as of now. Suggestions have been given for growth of forensic science facilities and improvement in the skills of investigating officers, to properly search, collect and preserve forensic materials.

**On the basis of the empirical data and field investigations the following observations / suggestions have been made in the study:**

i. For more extensive and effective use of forensic evidence, the present

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mindset that such evidence is merely corroborative in criminal trial has to change. This can be achieved by introducing following means: -

- (a) by laying more emphasis on collection of physical evidence in the police procedure code and the code of investigation.
- (b) through better training of officers, investigating
- (c) by making FSLs respond promptly and quickly to the needs,
- (d) the judiciary may also be more vigilant about forensic evidence, and may ask for better quality of the forensic evidence and promptness on the part of the Police and FSLs

ii. The detective role of the FSLs has to develop to make the analytical role more focused and purposeful. So, there may be 'Clue-teams' or 'Scene of Crime Teams' for collection of forensic materials from the scene of crime.

iii Appointment of Scene of Crime Officers (SOCO) and protection of the scene of crime to guard against loss of forensic materials.

iv. Benefit of the amendment of Section 293 Cr.P.C. in the recently amended Cr.P. C. (2005) can be availed by notifying the scientific experts in the new fields of forensic science such as DNA typing, Computer and Telephony investigation for voice identification, Forensic Acoustics (speaker identification), Forensic image processing, Osteology and Odontology etc. by the Central Government so as to make the experts opinion admissible in the Court.



v. Changes in the existing procedure of dispatch of forensic materials to FSLs. Except in cases where section 5 of the Identification of Prisoners Act, 1920, is applicable, in all other cases, the investigating officer may send the forensic materials to the FSL, without going through the court.

vi. Forensic awareness among the police officers, prosecutors and judicial officers, through training courses and periodic meeting and co-ordination.

vii. To streamline the medico-legal aspect in investigation, a time frame for medico-legal reports may be set, with legal and procedural compulsions. A similar timeframe may be devised for various types of forensic examination and may be brought within legal and procedural directives.

viii. Association of forensic scientists with postmortem examination will eliminate avoidable complications.

ix. While the budget and shortage of manpower may be taken care of as suggested above, the priorities for the CFSLs in the Forensic Directorate, New Delhi, may be suitably set in the light of the status of Forensic Science as an altruistic science. More emphasis should be on the ground spread with participation in detection and prompt and professional disposal of cases.

x. By wider ground spread, the forensic awareness and better co-ordination may be achieved. Examples of Gujarat, Andhra Pradesh and to some extent in Haryana are encouraging in this regard.

xi. A training programme for the forensic experts especially in the Law of Evidence and Criminal Procedure Code

on a regular and compulsory basis. They may learn how to dispose in a court of law.

xii. The scientists should receive a feedback of their work from the investigating officers after the disposal of the case.

xiii. The induction-training programme of investigating officers may put more emphasis on forensic evidence and this may be sustained by in later career, by

- a) Supply of forensic kits to the Police Stations
- b) By supervising officers' mandatory instructions and directions on collection and use of forensic evidence.
- c) By periodic training in scientific evidence and making them acquainted with new scientific developments in the field.

xiv. Along with this the infrastructure facilities like, better preservation of forensic materials and easier and hassle-free procedure for dispatching materials to the FSL will encourage investigating officers to use forensic evidence more and more.

xv. The Public Prosecutors should know the technique of eliciting relevant points from the expert" and should protect the expert from the defense lawyer's scurrilous references.

xvi. In a demand supply scenario, the consumers" preference will determine the quality of the product. The judge and public prosecutors may be explicit and vocal with regard to the deficiencies, inadequacies of forensic evidence and their expectations in this regard.

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xvii. The Research and Development Projects of the Directorate of Forensic Science, MHA, may explore the avenues for more creative application of science in the field of crime detection and investigation.

This Bureau appreciates the excellent study carried out by Bengal University of Juridical Science and for

those valuable suggestions made to improve utilization of Forensic Science in Crime Investigation Work. I am sure these suggestions will help the Forensic Scientists, Police Officers and policy makers to take necessary steps to improve the use of Scientific Aids in investigation in order to increase the conviction rate and bring more professionalism in the service.

## Technology Up-date

# A History of Body Armour -Bullet Proof Vests

### How Does Body Armour Work?

When a handgun bullet strikes body Armour, it is caught in a “web” of very strong fibers. These fibers absorb and disperse the impact energy that is transmitted to the vest from the bullet, causing the bullet to deform or “mushroom.” Additional energy is absorbed by each successive layer of material in the vest, until such time as the bullet has been stopped.

Because the fibers work together both in the individual layer and with other layers of material in the vest, a large area of the garment becomes involved in preventing the bullet from penetrating. This also helps in dissipating the forces, which can cause non-penetrating injuries (what is commonly referred to as “blunt trauma”) to internal organs. Unfortunately, at this time no material exists that would allow a vest to be constructed from a single ply of material.

Currently, today’s modern generation of concealable body Armour can provide protection in a variety of levels designed to defeat most common low- and medium-energy handgun rounds. Body Armour designed to defeat rifle fire is of either semi rigid or rigid construction, typically incorporating hard materials such as ceramics and metals. Because of its weight and bulkiness, it is impractical for routine use by uniformed patrol officers and is reserved for use in tactical situations where it is worn externally for short periods of time when confronted with higher level threats.

### This Bureau appreciates the excellent study carried out by West Methods of Construction

Typically, concealable body Armour is constructed of multiple layers of ballistic fabric or other ballistic resistant materials, assembled into the “ballistic panel.” The ballistic panel is then inserted into the “carrier,” which is constructed of conventional garment fabrics such as nylon or cotton. The ballistic panel may be permanently sewn into the carrier or may be removable. Although the overall finished product looks relatively simple in construction, the ballistic panel is very complex.

Ballistic fabric is available from a number of manufacturers in various styles and compositions, each type having unique ballistic resistant properties. The body armour manufacturer may construct a given model of ballistic panel from a single fabric style or from two or more styles in combination. The location and number of layers of each style within the multiple-layer ballistic panel influence the overall ballistic performance of the panel. In addition, some manufacturers coat the ballistic fabric with various materials. For example, the manufacturer may add a layer of non-ballistic material for the sole purpose of increasing blunt trauma protection. Even composites of two or more different ballistic materials are available. As a consequence, it is impossible to compare one product with another based solely on the number of fabric layers in the ballistic panel.

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The manner in which the ballistic panels are assembled into a single unit also differs from one manufacturer to another. In some cases, the multiple layers are bias stitched around the entire edge of the panel; in others, the layers are tack stitched together at several locations. Some manufacturers assemble the fabrics with a number of rows of vertical or horizontal stitching; some may even quilt the entire ballistic panel. No evidence exists that stitching impairs the ballistic resistant properties of a panel. Instead, stitching tends to improve the overall performance, especially in cases of blunt trauma, depending upon the type of fabric used.

Body Armour intended for routine use is most often designed to be worn beneath the normal uniform shirt. Again, manufacturers tend to design different methods of attaching armour to the body. Hook-and-pile fasteners are common, as are "D" ring-tightening straps. With the exception of metal fasteners of any type (which can deflect a bullet on impact and pose a hazard), the method of attachment is a matter of personal preference.

### **Materials Used**

Several manufacturers have been involved in developing and refining materials used in body armour.

DuPont has developed law enforcement protection products for more than 25 years. Its *Kevlar* brand fiber, first developed in 1965, was the first material identified for use in the modern generation of concealable body armour. Kevlar is a manmade organic fiber, with a combination of properties allowing for high strength with low

weight, high chemical resistance, and high cut resistance. Kevlar is also flame resistant; does not melt, soften, or flow; and the fiber is unaffected by immersion in water.

Kevlar 29, introduced in the early 1970s, was the first generation of bullet resistant fibers developed by DuPont and helped to make the production of flexible, concealable body Armour practical for the first time. In 1988, DuPont introduced the second generation of Kevlar fiber, known as Kevlar 129. According to DuPont, this fabric offered increased ballistic protection capabilities against high energy rounds such as the 9mm FMJ(Full Metal Jacket). In 1995, Kevlar Correctional was introduced, which provides puncture resistant technology to both law enforcement and correctional officers against puncture type threats.

The newest addition to the Kevlar line is Kevlar Protera, which DuPont made available in 1996. DuPont contends that the Kevlar Protera is a high-performance fabric that allows lighter weight, more flexibility, and greater ballistic protection in a vest design due to the molecular structure of the fiber. Its tensile strength and energy-absorbing capabilities have been increased by the development of a new spinning process.

Spectra fiber, manufactured by AlliedSignal, is an ultra-high-strength polyethylene fiber. Ultra high molecular weight polyethylene is dissolved in a solvent and spun through a series of small orifices, called spinnerets. This solution is solidified by cooling, and the cooled fiber has a gel-like appearance.

The Spectra fiber is then used to make Spectra Shield composite. A layer of Spectra Shield composite consists of two unidirectional layers of Spectra fiber, arranged to cross each other at 0- and 90-degree angles and held in place by a flexible resin. Both the fiber and resin layers are sealed between two thin sheets of polyethylene film, which is similar in appearance to plastic food wrap. According to AlliedSignal, the resulting nonwoven fabric is incredibly strong, lightweight, and has excellent ballistic protection capabilities. Spectra Shield is made in a variety of styles for use in both concealable and hard Armour applications.

AlliedSignal also uses the Shield Technology process to manufacture another type of shield composite called Gold Shield. Gold Shield is manufactured using aramid fibers in place of the Spectra fiber. Gold Shield is currently made in three types: Gold Shield LCR and GoldFlex, which are used in concealable body Armour; and Gold Shield PCR, which is used in the manufacture of hard armor, as plates and helmets.

Another manufacturer, Akzo Nobel has developed various forms of its aramid fiber TWARON for body Armour. According to Akzo Nobel, this fiber uses 1,000 or more finely spun single filaments that act as an energy sponge, absorbing a bullet's impact and quickly dissipating its energy through engaged and adjacent fibers. Because more filaments are used, the impact is dispersed more quickly. Akzo claims their patented Microfilament technology allows maximum energy absorption at minimum weights while enhancing comfort and flexibility.

Akzo Nobel maintains that the use of TWARON in body armour significantly reduces the overall weight of the finished product, thus making vests more comfortable. Akzo also contends that stitching panels made from layers of TWARON is largely unnecessary, and that the lack of stitching contributes to a lighter weight and softer feel while affording the same protection.

Another fiber used to manufacture body Armour is Dyneema. Originated in Netherlands, Dyneema has an extremely high strength-to-weight ratio (a 1- mm-diameter rope of Dyneema can bear up to a 240-kg load), is light enough that it can float on water, and has high energy absorption characteristics.

### **Liquid Body Armour**

Liquid armour for Kevlar vests is one of the newest technologies being developed at the U.S. Army Research Laboratory to save Soldiers' lives. This type of body armour is light and flexible, which allows soldiers to be more mobile and won't hinder an individual from running or aiming his or her weapon.

The key component of liquid armour is a shear thickening fluid (STF). STF is composed of hard particles suspended in a liquid. The liquid, polyethylene glycol, is non-toxic, and can withstand a wide range of temperatures. Hard, nanoparticles of silica are the other components of STF. This combination of flowable and hard components results in a material with unusual properties.

During normal handling, the STF is very deformable and flows like a liquid. However, once a bullet or frag hits the vest, it transitions to a rigid material,

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which prevents the projectile from penetrating the Soldier's body. To make liquid armour, STF is soaked into all layers of the Kevlar vest. The Kevlar fabric holds the STF in place, and also helps to stop the bullet. The saturated fabric can be soaked, draped, and sewn just like any other fabric. .

The goal of the technology is to create a new material that is low cost and lightweight which offers equivalent or superior ballistic properties as compared to current Kevlar fabric, but has more flexibility and less thickness. Liquid armour is still undergoing laboratory tests, but scientists are enthusiastic about other applications that the technology might be applied to.

"The sky's the limit," said scientists. "We would first like to put this material in a soldier's sleeves and pants, areas

that aren't protected by ballistic vests but need to remain flexible. We could also use this material for bomb blankets, to cover suspicious packages or unexploded ordnance. Liquid armour could even be applied to jump boots, so that they would stiffen during impact to support Soldiers' ankles."

In addition to saving Soldiers' lives liquid armour in Kevlar vests could help those who work in law enforcement. Prison guards and police officers could also benefit from this technology. Liquid armour is much more stab resistant than conventional body armour. This capability is especially important for prison guards, who are most often attacked with handmade sharp weapons.

**(Abhijit Sen)**  
**S.S.O.(E), BPR&D**

# President's Police Medal For Distinguished Service- Republic Day-2005.

## **Andhra Pradesh**

1. Smt. Aruna M. Bahuguna, Inspector General of Police, Controller Legal Metrology, Hyderabad, Andhra Pradesh.
2. Shri T. Ananthaiah, Commandant, Vijayawada, Andhra Pradesh.
3. Shri I. Raghava Rao, Dy.SP, A.P. Police Academy, Hyderabad, Andhra Pradesh

## **Assam**

4. Shri S.N. Talukdar, Supdt. of police, SB Khilipara, Guwahati, Assam.

## **Bihar**

5. Shri Subodh Kumar Singh, DIGP, Patna, Bihar
6. Shri Masum Aziz Kazmi, DIGP, Mongyr, Bihar

## **Chhattisgarh**

7. Shri Ramesh Chandra Sharma, DIG/SSP, Durg, Chhattisgarh,
8. Shri Gurumej Singh Bambra, CSP, Urla Raipur, Chhattisgarh

## **Himachal Pradesh**

9. Shri D S Manhas, ADGP/AP&T, Shimla, Himachal Pradesh

10. Shri Onkar Chand Thakur, DIG/CR, Mandi, Himachal Pradesh

## **Jammu & Kashmir**

11. Shri P.K. Gupta, IGP, Crime & Rly, Jammu & Kashmir

## **Jharkhand**

12. Shri Shivaji Mahan Cairae, DGP, Jharkhand, Ranchi
13. Shri Ram Lakhan Prasad, Commandant JAP-3, Govindpur, Dhanbad, Jharkhand

## **Karnataka**

14. Shri D V Guruprasad, ADGP, State Intelligence, Bangalore, Karnataka
15. Shri K S Suresh Babu, Inspector General of Police, BMTF Bangalore, Karnataka
16. Shri K S Thammaiah, Deputy Superintendent of Police, Nanjangud Sub-Division, Karnataka

## **Kerala**

17. Shri Jacob Punnoose, Addl DGP, Thiruvananthapuram, Kerala
18. Shri R K Madhekar, Addl DGP, Thiruvananthapuram, Kerala

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19. Shri B. Sasidharan,  
DY Supdt. of Police  
Thiruvananthapuram, Kerala

### **Madhya Pradesh**

20. Shri O.P.Garg,  
Addl. Director General of Police  
( Railways), Bhopal,  
Madhya Pradesh.
21. Shri A.K.Soni,  
Deputy Inspector General,  
SB, PHQ, Bhopal,  
Madhya Pradesh.
22. Shri L.L.Sharma,  
Reserve Inspector,  
Mandsaur, Madhya Pradesh.
23. Shri Tej Singh Panwar,  
Sub-Inspector,  
SB,PHQ,  
Bhopal, Madhya Pradesh.
24. Shri Vishwakant Vyas,  
Head Constable,  
DSB,  
Sehore, Madhya Pradesh.

### **Maharashtra**

25. Shri Jeevan D Virkar,  
Addl.DGP, HQ,  
Mumbai, Maharashtra.
26. Shri Abdul Rajjak Abdul Karim,  
Inspector, Nagpur, Rural,  
Maharashtra

### **Manipur**

27. Shri Ngamkhohen Kipgen,  
Supdt. of Police, Vigilance,  
Imphal, Manipur.
28. Shri Kh.Dhanachandra Singh,  
Assistant Commandant,  
2nd MR, Manipur.

### **Mizoram**

29. Shri Zoramawia,  
AIGP-I, Mizoram.

### **Orissa**

30. Shri Sarangadhar Raiguru,  
IGP( Trg), Cuttack,  
Orissa.

### **Punjab**

31. Shri Chander Shekhar,  
Addl.DGP,  
Chandigarh, Punjab.

### **Rajasthan**

32. Shri S.N.Jain,  
IGP, BSF, Rajasthan Frontier,  
Jodhpur, Rajasthan.
33. Shri V.K.Godika,  
Inspector General of Police,  
Udaipur Range,  
Udaipur, Rajasthan.
34. Shri Thawar Chand Damor,  
Supdt. of Police,  
Chittorgarh, Rajasthan.
35. Shri Damodar Vyas,  
Dy.SP, C.O. East Jodhpur City,  
Rajasthan.
36. Shri Kailash Chand Pareek,  
Asstt. Sub-Inspector,  
Crime Branch,  
Bhilwara, Rajasthan.

### **Sikkim**

37. Shri C. M. Ravindran,  
Addl.DGP,  
Gangtok, Sikkim.



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**Tamil Nadu**

38. Shri Anoop Jaiswal,  
Joint Director,  
V& A.C.  
Chennai, Tamilnadu.
39. Shri Narinder Pal Singh,  
Inspector General of Police,  
WZ, Coimbatore, Tamilnadu.
40. Shri S.G.Rajendran,  
Dy. Inspector General,  
Chengalpattu Range, Tamil nadu.
41. Shri K.Periasamy,  
Dy Supdt. of Police,  
Salem, Tamilnadu.

**Tripura**

42. Shri Debjan Chakma,  
Inspector,  
Udaipur, Tripura.
43. Shri Rabindra Bhattacharjee,  
Head Constable, Tripura.

**Uttar Pradesh**

44. Shri Babu Lal Yadav,  
Addl. DGP,  
Lucknow, Uttar Pradesh.
45. Shri P.C.Sabarwal,  
Inspector General,  
Karmik,UP,  
Lucknow, Uttar Pradesh.
46. Shri K.N.D.Dwivedi,  
Dy Inspr.Genl of Police, Bareilly,  
Uttar Pradesh.
47. Shri Amar Dutt Misra,  
DIG Railway,  
Allahabad, Uttar Pradesh.
48. Shri N.K.Srivastava,  
SP, Intelligence,  
Intelligence Hqrs,  
Lucknow, Uttar Pradesh.

49. Shri Y.K. Pachauri,  
Supdt. of Police, Railway,  
Moradabad, Uttar Pradesh.
50. Shri Dinesh Kumar Sharma,  
Inspector General, Security,  
Lucknow, Uttar Pradesh.
51. Shri Udayan Parmar,  
IG/Principal Police Training  
College, Moradabad,  
Uttar Pradesh.
52. Shri H.S Balwaria,  
IG/Director Prosecution,  
Lucknow, Uttar Pradesh.
53. Shri Om Prakash Dikshit,  
IG Power Corpn.Ltd.,  
Lucknow, Uttar Pradesh
54. Shri Shive Narayan Singh,  
IG Human Rights,  
Lucknow, Uttar Pradesh.
55. Shri B.M.Tripathy,  
Supdt. of Police,  
Hardoi, Uttar Pradesh.
56. Shri Hari Singh Gurang,  
Platoon Comdr,PAC Band,  
35 BN PAC,  
Lucknow, Uttar Pradesh.

**West Bengal**

57. Shri Debendra Nath Biswas,  
Inspector General of Police,  
Kolkata, West Bengal.
58. Shri Sandhi Mukherjee,  
Inspector General of Police,  
Intelligence Bureau,  
Kolkata, West Bengal.
59. Shri Joydeb Chakrabarty,  
Inspector General of Police,  
Writers Buildings,  
Kolkata, West Bengal.

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60. Shri Parimal Kumar Mitra,  
Deputy Commissioner of Police,  
7th BN KAP,  
West Bengal.

61. Shri Chayan Kumar Mukherjee,  
Inspector General of Police,  
West Bengal.

62. Shri Nirmal Kumar Das,  
Assistant Commissioner of  
Police, Central Division,  
West Bengal.

### **Chandigarh UT**

63. Shri Rajesh Kumar,  
Inspector General of Police,  
Chandigarh Administration.  
Chandigarh.

### **N.C.T. of Delhi**

64. Shri Rajinder Singh,  
Inspector, West Delhi,  
NCT. of Delhi, Delhi.

65. Dr. U.N.B. Rao,  
Jt. Commissioner of Police,  
N.C.T. of Delhi, Delhi.

### **Assam Rifles**

66. Shri Kaziman Gurung,  
Sub Major, Kimin Ghaspani,  
Assam Rifles.

### **Border Security Force**

67. Shri B K Dey,  
IG/Director,  
BSF Academy,  
Tekanpur, Border Security Force

68. Shri Suresh Kumar Dutta,  
IG FTRHQ BSF NB,  
Kadamtala,  
Border Security Force

69. Shri Mohan Lal Verma,  
DIG, FHQ, BSF,  
CGO Complex,  
New Delhi.

70. Shri Mohinder Lal,  
DIG CSWT BSF,  
Indore, Border Security Force

71. Shri Wazir Singh Panwar,  
2 I/C , Udaipur,  
Border Security Force

72. Dr. Samir Kumar Das,  
CMO, FHQ BSF Medical Dte.,  
Border Security Force

73. Shri Krishan Ram Chakoti,  
Inspector, FTR HQ BSF TRA,  
Salbagan, Border Security Force

74. Shri P.B. Chhetry.,  
Inspector, BSF Academy,  
Tekanpur, Border Security Force

### **(BPR & D)**

75. Shri Jagdip Singh,  
Vice Principal, CDTS,  
Chandigarh, MHA (BPR&D).

### **C.B.I.**

76. Smt. Archana Ramasundaram,  
Joint Director, CBI,  
New Delhi.

77. Shri Deo Kumar Choudhry,  
Supdt. of Police, EOW, CBI,  
New Delhi.

78. Shri Tarini Prasad Jha,  
Supdt. of Police,  
BS&FC, CBI,  
Kolkata

79. Shri Sivaji Rajagopal,  
Addl Supdt. of Police, ACB, CBI,  
Chennai..

**President's Police Medal For Distinguished Service- Republic Day-2005.**

80. Shri Nirmal Kumar Mukherjee,  
Addl Supdt. of Police,  
BS & FC,CBI, Mumbai.

81. Shri Tridebeswar Das,  
DSP,ACB,CBI,  
Kolkata.

82. Shri Kumar Amar Singh,  
DSP,AHD,CBI,  
Patna.

**C.I.S.F.**

83. Shri Vinod Kumar Bakshi,  
DIG,NISA,CISF,  
Hyderabad.

84. Shri Jai Bhagwan Kaushik,  
Sr. Commandant, GPHQ,CISF,  
Guwahati.

85. Shri Chaman Lal Bhatia,  
Dy.Comdt.CISF,

86. Shri Dhan Singh,  
Asstt. Comdt., NISA,CISF,  
Hyderabad.

87. Shri K.A. Nancharaiah,  
Sub-Inspector,BHEL,CISF,  
Hyderabad.

**CRPF**

88. Shri S.C. Sharma,  
Inspector General of Police,  
CRPF, Shillong.

89. Shri Man Singh Rawat,  
DIGP, Dte. General,  
CRPF, New Delhi,

90. Shri Dulal Chandra Dey,  
DIGP, CRPF,  
Agartala (Tripura),

91. Shri Harbhajan Singh,  
DIGP, RTC-I, CRPF,  
Neemuch.

92. Shri M.S. Aggarwal,  
DIGP, Pallipuram, CRPF,  
Thiruvananthapuram,

93. Shri B.D.S. Chauhan,  
ADIGP, GC-I, CRPF,  
Ajmer,

94. Shri Raghbir Singh,  
ADIGP, CRPF, Jammu,

95. Shri D.R. Pathak,  
ADIGP, GC-CRPF,  
Gwalior.

96. Shri S.P.S. Nagar,  
Commandant, 136 BN, CRPF  
Nalbari.

97. Shri Chandras Sekharan  
T. Commandant, CTC-II, CRPF,  
Coimbatore.

98. Shri Jogindra Singh,  
Commandant,  
DTE. General, CRPF,  
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99. Shri M S Bhurji,  
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I.T.B.P.,Academy,

100. Shri J V S Chaudhary,  
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SHQ, J&K, I.T.B.P.

101. DR. Pratap Chandra Panda,  
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I.T.B.P.

102. Shri Mahendra Kumar,  
DY COMDT.(ENGG),  
Kullu, I.T.B.P.

103. Shri Kanhaiya Lal Pokhriyal,  
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105. Shri Udayan Mukerji,  
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Addl Dy. Director (Tech.),  
Ministry of Home Affairs
107. Shri Aditya Kumar,  
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108. Shri S.K. Verma,  
Joint Dy. Director,  
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109. Shri S.K. Sharma,  
Assistant Director,  
Ministry of Home Affairs
110. Shri A.N. Jha,  
Assistant Director,  
Ministry of Home Affairs
111. Shri G.T.Bhutia,  
Assistant Director,  
Ministry of Home Affairs
112. Shri S.K.Seshadri,  
Assistant Director,  
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113. Shri K.C.Karluipia,  
Assistant Director,  
Ministry of Home Affairs
114. Shri V.Karthikeyan,  
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117. Shri B.B.Magotra,  
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118. Shri S.P.Panda,  
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## OUR MISSION

*To Promote Excellence and Best Value by:*

- 1. Investing in Research & Developing Policies and Practices for Police and Correctional Services.*
- 2. Seeking and Securing Appropriate Technology for Enhanced Performance.*
- 3. Investing in Human Resource Development through Training and by Imbuing Scientific Temper.*
- 4. Formulating Strategic Vision to Meet Future Challenges and Assist to Stakeholders.*
- 5. Building Police as a Professional Service for People.*
- 6. Fostering Co-operation and Coordination among State & Central Police Organisations for Common Vision.*

## THE MOTTO

*Promoting Good Practices and Standards*