

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI[®]

**Can Genetic Justice Survive?
DNA Technology and Social Control in the 21st Century**

Rachel Huggins

A Thesis

In

The Department

Of

Sociology and Anthropology

Presented in Partial Fulfillment of the Requirements
for the Degree of Master of Arts at
Concordia University
Montreal, Quebec, Canada

March 2000

© Rachel Huggins, 2000



National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*

Our file *Notre référence*

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-54286-6

Canada

ABSTRACT

Can Genetic Justice Survive? DNA Technology and Social Control in the 21st Century

Rachel Huggins

DNA technology will impact many areas in society and has been swept up by some members of the criminal justice system as a tool to aid in the “war against crime”. As a fairly recent innovative technology DNA evidence has found a place within the state’s contemporary process of crime control. This science has not only transformed crime control but has offered the criminal justice system a method of social control that relies on our genetic make-up, is highly accurate, but includes an invasion of privacy right. This study is a theoretical trend analysis of how the criminal justice system has shifted from a human-based to a science-based system of crime control, and how DNA technology has encouraged the process. The issues addressed include ideologies relied upon by the criminal justice system (in United States, United Kingdom and Canada) to promote, regulate and determine the use of DNA technology, and the public’s reaction to what some call an invasive technology. DNA technology like many other technologies, can sometimes be a double-edged sword: there are benefits and adverse affects to society when DNA technology is used for crime control. There is also a potential for misuse of this technology and abuse by those who should be protecting not only societal interest as defined by government, but the privacy interest and rights to fair and equal justice on the part of all citizens.

Acknowledgment

I believe there is no reason to look back on the past unless it is to see how far you have come. I have earned the right, and look back on my years at Concordia University with the fondest of memories.

First and foremost I would like to thank my mother who taught me the value of working hard. Your strength and spirit are always with me.

There are many other people I would like to thank for their encouragement and support. To my sister Maureen, her husband Kenneth and my nephew Roland, thank you for being there and always making me laugh. Nadine, I would like you to know just how much I value your support and thank you for always knowing exactly what to say to get me through the rough spots. I could not have completed this thesis without you in my corner. Through your example I have learnt strength, endurance and most importantly patience. To my little sisters Raquel and Falana thank you for always being there to listen. Hana, Maria and Sarah no words can express my appreciation for all the kind words and encouragement you have dispensed. A special thanks to my personal “*Crime and DNA Panel*”, Alisie and Karen. Completing this degree would have been even harder if it were not for the hours spent discussing all of my ideas with you both.

I would like to thank the Sociology Department at Concordia University for offering a dynamic program with the most supportive teachers and staff members, special thanks to Jody and Josie. Thank you Prof. Neil Gerlach for being my adviser. To Prof. Greg Nielsen, my greatest appreciation for always pushing me to give more and do better, it has most definitely paid off.

Last but certainly not least, is a heart-felt thank you to Prof. Anthony Synnott. Throughout my university years you have encouraged me to go further and strive for excellence. Moreover, you saw potential in my academic ability that without your support I would never have discovered. I hope that all students are fortunate enough to enjoy the support of such a distinguished professor and truly decent human being.

TABLE OF CONTENTS

INTRODUCTION	1
CHAPTER 1	
THEORY	8
Diagram 1. Penal-Welfare and Tough on Crime Approach	11
Theories of Social Control	12
Informal Social Control Theories	12
Formal Social Control Theories	16
The State and Crime Control	17
Risk Theory and Crime Control	19
Diagram 2. The Criminal Justice System's Risk Management Model	20
DNA Technology	23
Politics and Technology	26
Summary	31
CHAPTER 2	
THE CRIMINAL JUSTICE SYSTEM AND THE CITIZEN	20
Conceptual Climate	33
Managing Crime, Justice and Criminals	35
Corrections and Criminal Justice	38
Surveillance Framework	42
Crime Control and DNA Technology	46
Summary	50
CHAPTER 3	
HISTORY OF DNA TECHNOLOGY	43
The Discovery of DNA	52
The Privacy Issues	65
DNA: Privacy and Civil Rights	66
DNA and Criminal Investigations	70
Summary	73
CHAPTER 4	
DNA, GUILT AND INNOCENCE	75
Agents of the Institution of Justice	75
Eyewitness and Jailhouse Informant Testimony	84
The Criminal Justice System	97
CONCLUSION.....	112
BIBLIOGRAPY	116

Introduction

The purpose of this study is examine the current status of the criminal justice system by evaluating its conceptual climate in terms of assumptions about crime and its policies used to manage crime, justice and criminals. In particular I will examine how DNA technology fits into the state's contemporary process of crime control and contributes to the transformation of the nature of social control in society. The thesis being presented is that DNA is a double-edged sword: it will benefit the criminal justice system and has done so—in the United Kingdom, the United States and Canada—in two ways

1-by helping to control and manage crime

2-by helping to exonerate the innocent

But it is also problematic in a number of ways, which I will consider.

My research is a theoretical trend analysis of how the criminal justice system has moved from a human-based to a science-based system and how DNA technology fits into the shift. This study examines the convictions that formulated the past and present approaches of how we deal with crime and criminals. Since the topic of DNA technology is fairly new I have chosen to examine the ideologies concerning how the State (specifically in the United Kingdom, United States and Canada) and criminal justice system is promoting, regulating and using DNA technology, and the public's reaction. The bodies of literature used in this theoretical analysis were academic literature, technical federal and state government documents (U.S. and Canada), civil liberties and Amnesty International documentation, historical and technical developmental documentation and press releases.

This study will contribute to the study of DNA and the criminal justice system in that it ponders some of the challenges to the current criminal justice system and the potential ramifications of introducing DNA technology, particularly the negative implications of DNA technology. Since this thesis is a trend analysis the opportunity to contemplate future prospects and disappointments presents itself.

To reduce the crime rates and minimize fear of crime, the state has experimented with a variety of crime control approaches. For most of the 20th century the Penal-Welfare approach predominated. As we move into the 21st century however, a 'tough on crime' approach has emerged. The criminal justice system is the key means through which the state implements its various crime control strategies.

The penal-welfare approach (particularly from the 1960s to 1980's), the main goal of which was rehabilitation, achieved moderate success on a social level in that it created awareness of the cause of crime and promoted social programming for high risk perpetrators. It did not, however, achieve the level of success expected in terms of reducing the occurrence of crime or minimizing citizen fear of crime—i.e. it did not meet the goal of crime control. In part because of the limited success of the penal-welfare approach, governments shifted to a more hard line approach to crime control. The 'tough on crime approach' (adopted in the late 1980s), whose goals were primarily retribution and deference, became the basis for crime control and management. This approach was symbolised by the return of capital punishment in the United States, and a massive prison building program to accommodate an increased prison population, zero-tolerance policies

in the war on drugs, mandatory sentencing and three strikes legislation in some states.

Among the impacts of the new 'tough on crime approach' are: an increased number of police officers whose community presence is more visible, tougher gun control laws, the empowering of citizens to protect and police themselves, and generally more severe consequences for those convicted of criminal behaviour. The policies and legislative changes that characterise the 'zero tolerance' attitude inherent to the tough on crime approach have modified how the burden of crime control is distributed. There has been a shift from a state-only model, to a model that encourages the "responsibilization" of non-state institutions and individuals (Garland, 1996:464).

The state's methods for managing crime have also been reformulated. Whereas a key concern of the state remains the protection of citizens and their property, there is a new preoccupation with efficiency and risk analysis. A risk management strategy has been implemented through the justice system as a means of efficiently identifying, assessing and ensuring the accountability of those participating in criminal activity.

While debate continues about what makes crime control effective, the use of new technological and scientific tools has enhanced the state's ability to deal with crime efficiently, and particularly the employment of DNA technology. The creation of databases, used to identify criminals within the justice system is a direct outcome of the proven efficiency of DNA science to solve crimes. Gene mapping, the process used to determine DNA matches, has surpassed the expectations of scientists, sociologists and

criminologists.

The Problem

We live in a society that fears crime occurrence but treats it as a routine part of modern consciousness (Garland, 1996:446). Presently, the objective of social regulation is to assess and manage risk with the efficiency of a business transaction. In the hope of enhancing efficiency of the criminal justice system, the acceptance and application of DNA testing has become widespread: United States, Europe and Canada. Indeed, DNA technology is, it is widely claimed, the first and only means to achieving an absolute scientific certainty in identifying criminals through their genes. If applied neutrally this technology can transform the administration of criminal justice eliminating the potential for wrongful convictions and re-creating the system into an accurate credible organisation.

While many believe that the use of DNA technology will bring the criminal justice system closer to 'winning the war on crime, the problem is that DNA technology can be manipulated and devalued, particularly when its results do not support the state's perception of justice, or when it jeopardises the integrity of the system itself. Indeed the "scientific" system is not infallible, since it is applied, used, misused and abused by humans. Such an undertaking by those representing the criminal justice system will in fact hinder the potentials of DNA technology, in particular for those wrongly convicted of serious violent offences. After all this scientific tool has been implemented under the assumption that the system seeks to improve efficiency in criminal justice and utilise technology to its fullest potential.

This study postulates that, since human-oriented methods of crime control have not brought society closer to the goal of eliminating crime, we have progressively viewed ‘science-based’ methods such as DNA technology, as well as older technologies such as fingerprinting, spectroscopic analysis, lie-detecting technologies, voice-printing, etc., as more reliable means to solving the problem. This thesis seeks to examine the role of DNA technology in the processes implemented to control crime in the context of a ‘tough on crime’ approach to dealing with crime and criminals.

In the past ten years North America and much of Europe have experienced some of the impacts of using DNA technology in the criminal justice system. This has resulted in the conviction of serious violent offenders, the freeing of wrongfully convicted individuals and the identification of criminals who have eluded justice for decades. These types of benefits have contributed to the institutionalisation of DNA technology. The state may now issue legal warrants that require recipients to give DNA samples. These samples are placed in DNA databases. Furthermore it is currently mandatory for US military recruits to deposit a DNA sample.

With the fear of crime and the call for more control over criminals and crime the justice system has moved away from concerns with the individual. Such undertakings involve too many variables that need to be taken into consideration and can be costly. The criminal justice system is instead strategizing with a risk theory mentality. The concerns are with spatial and temporal aspects of crime. The criminal justice system is casting the net as wide as possible. The approach is to monitor behaviour by managing and controlling those who deviate from the norm with punishment and incarceration.

The state is there to protect citizens and their property and achieve a certain level of security. However, the tough on crime approach and risk management strategies have spread the burden of crime management and control to the public. Both the public and the criminal justice system have taken measures to manage crime and criminals. The problem lies in the fact that as a society we have not evaluated the negative implications that arise from too much control and surveillance. Using social control theory to explain the nature of state control, and risk theory as the mechanism used by the state to evaluate and assess risk, and to implement solutions in crime management, this thesis will describe the current state of criminal justice in Canada and the United States in terms of its operational policies and conceptual climate. Both of these factors contribute to shaping the manner in which crime, justice and criminals are managed. DNA technology has become a key component in the crime management process.

Limitations

The primary limitation of this research is the dearth of academic analysis on the possible negative consequences of DNA technology within the criminal justice system. Because gene-mapping science in criminal justice is a recently developed technique, legislative changes aimed at determining the legality of collecting and storing DNA evidence occurred only in 1995 in the United States, and 1998 in Canada. Therefore, there is an absence of data in this field.

Though much attention has been paid to the invasive nature of DNA sampling, attention has primarily focused on privacy issues rather than on the criminal justice system. The

greatest limitation to examining any issue that addresses the criminal justice system is the fact that reference materials tend to be fragmented. Information is generally relevant for only small, isolated sections of the intricate system. Another limitation to writing about such an unexplored aspect of a new phenomenon, is the reality that Canadian sources are scarce. The implementation of DNA into the Canadian criminal justice system is in its infancy. The century's first DNA database is expected to be launched in June 2000.

This analysis is therefore primarily an exploration of the American criminal justice system's use of DNA technology. Furthermore there are three important differences between Canadian and American justice systems:

- 1) The Canadian criminal justice system is far more centralized than the American.
- 2) The American crime rate, and especially the violent crime rate, is much higher than Canada's; as such, the accessibility and frequency of use of DNA evidence will be greater.
- 3) Learning from the experiences of the United States and the United Kingdom, Canada may not experience the same problems.

Sources

Technology will continue to have an important role in shaping our existence. As a result, *trend analysis* is an appropriate methodological tool to examine changes occurring in the criminal justice system and results stemming from the implementation of DNA technology. Approximately, fifteen academic sources have been used in the examination of the criminal justice system and technology. To investigate the specific factors

surrounding DNA technology an additional twenty-five sources were used. The sources for the articles are a variety of conventional newspapers and contemporary magazines—many of which derive from special topic-oriented websites including websites on DNA. Other resources used in this study of DNA technology were retrieved from government websites, investigative television news programs like Frontline (PBS), and professionals who are members of organised groups that publish work on concerns related to gene-mapping. In this theoretical analysis the academic sources derived from technical federal and state government agencies documents (U.S. and Canada), civil liberties and Amnesty International documentation, historical and technical developmental documentation and press releases.

Organisation of Thesis

Chapter 1 examines social control theories and how they have shaped thinking about criminal justice. This chapter further examines the shifts that have occurred in crime control and whether DNA technology has made the criminal justice system more efficient. Using risk theory—the basis for the risk management framework presently at work within the criminal justice system, this chapter describes and discusses current policies and methods of crime control. Specifically, the chapter looks at how risk management operationalizes the ‘tough on crime approach’ through an evaluation process to identify, assess and deal with criminals effectively and efficiently. Further, this chapter illustrates how DNA technology fits into the state’s policy of crime control as an “ideal” mechanism.

Chapter 2 is an exposition of the current state of the criminal justice system. The chapter examines what has changed in public and state perceptions of crime and control and how DNA technology fits into what the state and the public wants as a crime-fighting tool. This chapter examines the conceptual climate, looks at which crimes the state seeks to control most intensely, who is most likely to commit those crimes and what the outcomes are for the criminal justice system. Particular attention will be paid to the operational policies in the management of crime, justice and criminals. These include “Three-Strike” policy, “public- minded prevention”, surveillance, and DNA technology.

Chapter 3 examines DNA technology and how it has entered criminal justice systems of North America including the legalities of creating databases. This chapter looks at the history of DNA science and the implications of DNA on the criminal justice system. This chapter will also explore how the scientific approach to crime has resulted in an outcry from the public concerning privacy issues. Finally, I will discuss the potential for DNA technology to be manipulated and subverted either accidentally or deliberately.

Chapter 4 looks at the downfalls of the criminal justice system and how DNA technology has brought both efficiency, and its downfall, in the criminal justice system. The chapter begins with an examination of cases that used DNA exculpatory evidence to free 28 wrongly convicted men in the United States and particular attention is given to determining the causes of these wrongful convictions. This chapter also uses four cases as examples of the “failure” of DNA technology, as a result of action or inaction taken by agents of the criminal justice system.

Chapter 1: Theory

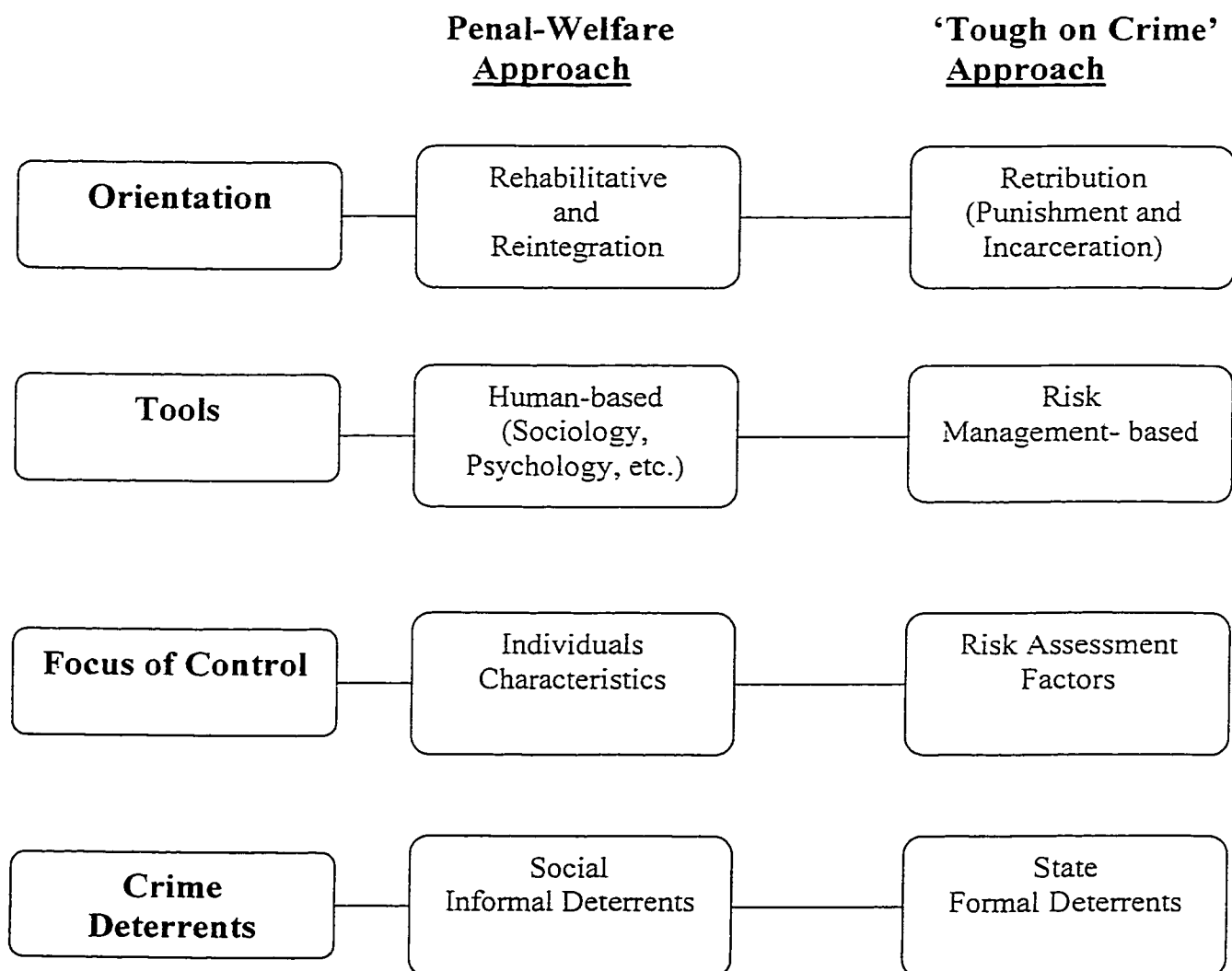
In what is to follow, a connection between social control theories and the criminal justice system will be drawn. I will begin by describing the theoretical inference of informal and formal social control theories, which have had a significant impact on the way the criminal justice system deals with offenders and crime. By establishing the conceptual approaches of informal and formal control theories, it is possible to determine and explain why and how the state's thinking about criminal justice has changed from a penal-welfare/rehabilitative approach, to a 'tough on crime' approach. The modifications of formal social controls implemented by the state will be characterized, and it will be determined why these theories of informal social control have been abandoned by the state.

My argument is that the state and the criminal justice system have undergone a major shift from a penal-welfare to a 'tough on crime' approach in part by the assistance of technology. The paradigm shift from rehabilitation to retribution over the past 50 years has been accompanied by, and perhaps facilitated by, a shift in the theorizing of crime from traditional social control and etiological theories to new risk management theories. The criminal justice system's orientation under a penal-welfare approach was to rehabilitate and reintegrate offenders into society based on their individual characteristics. The human-based approach reinforced informal social controls to prevent crime or recidivism and the deterrent factors were not only punitive, but social as well. Presently, the State and criminal justice system have come to rely on risk theory as a formula to achieve effective crime control. The focus of control is centered in assessing

factors that are considered ‘risky’. The orientation is based on punishment and incarceration to control crime. Risk management, the tool currently used to assess and evaluate risk, has a partner in technology and surveillance.

The primary concepts of both the Penal-welfare/rehabilitative and ‘tough on crime’ approaches are described in diagram 1.

Diagram 1.



Theories of Social Control

Social control theories elicit various strategies and techniques that help regulate human behaviour. On the one hand, the micro-social perspective focuses on informal control systems, which at one time functioned as the primary mechanism of control. On the other hand, the macro-social perspective deals with formal control systems such as the legal system, law enforcement and social directives of government. Micro and macro-social controls can have a positive or negative effect on conformity, depending on how society conceives of crime, justice and criminals (Gomme, 1998: 80).

Informal social controls consist of internalized norms, that come from one's socialized process, and are based on the premise that people conform because they do not want the negative stigma that is associated with deviant or criminal behavior. External social controls deal more with the loss of social or economic rewards due to either informal outer control—such as what others may think of you, or formal outer controls—such as family, community and ultimately state law enforcement in concentric circles of control (Gomme, 1998:80).

Informal Social Control Theories

Informal social controls were the principal devices to maintain order even when criminal law was established and still results in a high degree of individual conformity. Although there are various theories of informal social controls, three are particularly relevant to establishing how the criminal justice system has developed: Travis Hirsch's Bond Theory, Ivan Nye's Relationship Theory and Walter Reckless's Containment Theory.

These theories are relevant because Bond Theory integrates the various aspects and wide variety of external forces that impact our lives. Relationship Theory explains the origins of conformity, identifying the family as the primary point of origin for social learning. Nye argues that norms, morals and values that are learned in childhood will often remain and function as mechanisms for control throughout life. Finally, Containment theory provides insight into how pro-deviant external factors battle with inner conforming factors and how control is impacted by this struggle.

Bond theory states that deviance occurs when four important elements of an individual's life are deficient: attachment, involvement, commitment and belief. These factors have significance to the individual in that they contribute to the degree to which they conform to social rules and regulations. *Attachment* is important because it establishes the degree to which an individual is influenced by others to be perceptive to their wishes and expectations. In the absence of attachment individuals are less likely to be concerned with meeting external expectations and as such, may deviate from the social norms. *Commitment* involves channeling time and energy towards particular achievements resulting in a sense of personal accomplishment. In the absence of commitment, Hirshi argues the individual may lose the benefits brought by past achievements. These commitments are primarily to work and family, but may also include sports, hobbies, studies, etc. *Involvement* rests on a combination of attachment and commitment, and speaks to the need to have a focus. The argument is that if one is faced with idleness, mischief can result. Finally, the need for *belief* speaks to the need for the values that one is expected to adhere to particularly belief in the legitimacy of the social system. In the

absence of such belief the individual will feel no moral obligation to conform (as Marx and Engels had earlier noted) (Hagan, 1990:96-97).

Bond theory explores various outside forces or occurrences that may impact an individual's likelihood to conform. Taking the position that internal factors may influence conformity, Containment Theory explores the struggle that may occur between an internal desire to conform and external factors that encourage deviance (Gomme, 1998:81).

Containment theory developed by Walter Reckless, is one of the earliest perspectives on social control. Reckless believed that confusion in social and psychological forces in society, might lead to non-conforming behavior. The leading social forces identified by Reckless that may contribute to non-conforming behavior, are ones that are still present today—poverty, minority group identity and the absence of legitimate opportunities. In addition to potentially leading to non-conformity, these factors may equally lead to deviant behavior (Gomme, 1998:81-82).

Reckless stated that internal elements that lead to nonconformist behavior include desires, hostilities and feelings of inferiority or inadequacy. Reckless concluded that inner and outer pro-deviant forces are stronger than inner and outer conformist forces (Gomme, 1998:81). The implication then, is that citizens must be controlled primarily by external means. In contrast to Reckless' emphasis on the strength of external pro-deviant forces,

Ivan Nye puts forward a theory that identifies external social relationships as a mitigating factor that may reduce the impact of external pro-deviant forces.

Family Relationship theory is a version of social control theory that states that we are all equally prone to deviant behavior. The role of the family, from Nye's perspective, is to provide a socializing environment that can reduce the risk of deviance and criminality. Family socialization is expressed through internal controls, indirect controls, direct controls and legitimate need satisfaction (Gomme, 1998:82). Internal controls are defined as internalized norms and values based on the feelings of guilt and anxiety that are conditioned through punishments and rewards. Indirect controls are based on the individual's desire to not embarrass their family. Direct controls are based on restrictions and punishments within the family. Finally, the family's role in terms of need satisfaction speaks to the ability to provide for physical and emotional needs to the degree necessary to prepare the child for success in life (Hagan, 1990:98).

These three theories address how criminal influences and the contributing factors to crime were thought of in the past. Elements of the Bond, Containment and Family Relationship theories, were the principles that informed the thinking about preventing crime, rehabilitating and reintegrating criminals into society. These principles were primarily concerned with human well being and the ability of the individual to self regulate. Social consequences and rehabilitative measures were the primary deterrents to offending or re-offending before the late 1980s.

Formal Social Control Theories

With the development of state enforced formal external controls, “self-regulating” individuals transferred power to the state. The new role of the state as powerful regulator did not eliminate the central thesis of informal social control theories. The implementations of laws, a legal system and law enforcement simply required social control theories to place more emphasis on the consideration of formal control structures in their work (Black, 1984:4-5).

With emphasis being placed on macro-social controls, punishment replaced shame and guilt as the primary mode of social control, and deterrence theory assumed more theoretical prevalence.

The premise of deterrence theory is that crime or deviant behavior, is based on a rational cost–benefit analysis between the value brought by the act and the potential consequence of the act. Two factors are involved in rational choice decisions: (a) specific deterrence—where the direct punishment will dissuade the individual from committing or re-committing a deviant act and (b) general deterrence—where the threat of punishment is symbolic in that the individual is warned off by the potential cost of committing or re-committing a crime. Deterrence theory asserts that if there is severity in the punishment, certainty that the sanctions will be applied, and speed in handing it down, individuals will be less likely to commit crime (Gomme, 1998:84).

The State and Crime Control

Informal social control had for years been the framework for thinking about crime control. The belief was that if we worked on reinforcing internal informal controls (e.g. family interaction, and education), and external informal controls (e.g. job creation and healthy environments), individuals would be less likely to commit crime. In a growing and complex modern society, there are various problems with reinforcing informal controls, which are often vague and tend to overlap conceptually. Furthermore, informal controls are difficult to test because there are many vague variables to account for. As such, these controls and theories that support them are not able to fully explain adult deviant behavior. They do however, provide logical explanations for deviance in the face of a large number of intangible variables (Gomme, 1998:86-88).

Another limit to relying on informal social controls, is that they incorporate too many internal and external factors. For informal social controls to successfully encourage conforming behavior and dissuade deviant behavior, every social problem (poverty, racism, inequality, etc.) would have to be solved. Equally necessary would be the need to reinforce and hold every institution (schools, family households, etc.), to a standard of excellence. All of the internal and external factors would have to be perfect teachers, priests, parents and so forth (Gomme, 1998:86-88).

Informal social control theory was the dominant theoretical model used after the Second World War to prevent crime and rehabilitate criminals. Over time however, this framework has been considered inadequate. The result in the past 10 years or so, has

been a resurgence of Deterrence Theory. The shift back to looking at crime as a rational choice on the part of the criminal satisfies what society wants when it comes to dealing with crime effectively. Since the main component of Deterrence Theory is harsher punishment, it supports the public's perception that by increasing punitive measures at the expense of alternative measures, the criminal justice system will be more efficient. Ultimately, the State's formalized efforts to force citizens to conform through the use of criminal law "are not merely popular, they are simpler to implement and easier to evaluate than are alterations in informal social control mechanisms" (Gomme, 1998:85) and total societal transformation.

Deterrence Theory does have its limitations, for instance recidivism rates are high in both Canada and the U.S., and there is little research on whether increasing the severity of punishment actually reduces crime (Gomme, 1998: 90). Among the theory's positive effects is the fact that research has found that increasing the certainty of punishment does have a deterrent effect on criminal behavior. More importantly, even though there is substantial research that proves deterrents are not the most efficient ways to address crime, they are what the public demands. The idea of lengthening sentences, increasing the chances that criminals will be caught and administering stiff and speedy sentences is viewed as less expensive, disturbs fewer vested interests and receives less opposition from agents and agencies of the criminal justice system (Gomme, 1998:89-91).

After years of increasing crime rates and depleted social resources however, the State decided to emphasize formal social controls and rely on Deterrence Theory which in fact

supported the “tough on crime” approach. As Deterrence Theory supports punishment as a primary deterrent factor, the State increased punishments for some offences, increased the likelihood that criminals will be caught by hiring more officers, and established the certainty of punishment with mandatory and minimum sentences.

To carry the new “tough on crime” approach and the rejuvenation of Deterrence theory further, both the state and the criminal justice system are working towards eliminating the need to consider the impacts of informal inner or outer social controls on an individual’s criminal activity. The state has begun to assess crime occurrence using Risk Theory.

Policy-makers, politicians and practitioners in the criminal justice system, believe that in Risk Theory they have found a simplistic common sense political/economical answer to crime control, a means to cut through all the complexities and antecedents of crime.

Within the Risk Theory framework, social control theories and other speculation about the causes of deviance are considered fundamentally useless (Rock, 1989:6).

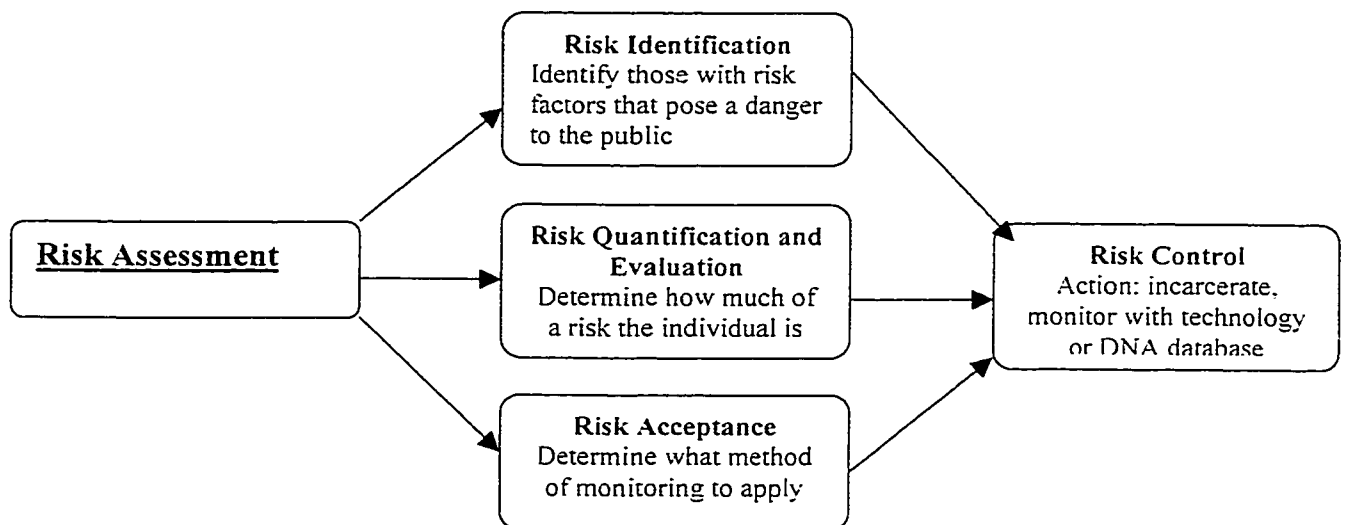
Risk Theory and Crime Control

Risk Theory asserts that society needs to be able to deal with people who are unaffected by crime deterrents. It is necessary to ascertain how much of a risk those individuals pose to society. The risk management process that stems from Risk Theory, calculates the risk of crime elements on society. The risk management process is used in a variety of disciplines and by a variety of institutions. Here, its application to crime control and the current state of the criminal justice system will be explored. The risk management

process involves effective risk assessment which includes risk identification, quantification, evaluation, acceptance, aversion and control.¹

Diagram 2.

The Criminal Justice System's Risk Management Model



This is a modified version of the "Steps in Risk Management" in the keynote address by Roger Smook at the Risk Assessment and Management Congress in Ogaki, Japan – September 1997.

Using the criminal justice system, the state has created a method by which to manage high-risk individuals by partnering deterrents and risk assessment. The goal of the state is to determine how serious crime is and how to deal with it effectively and efficiently. By undertaking risk assessments that take into consideration political, social and economic realities, efficient risk management decisions can be made. Such an approach, in my opinion, brings crime occurrence down to measurable factors and crime prevention becomes a scientific formula of probabilities.

¹ The Risk Management model is a modified version of the keynote address by Roger Smook at the Risk Assessment and Management Congress in Ogaki, Japan – September 1997.

The state has reverted back to Deterrence Theory with some modifications (effective crime control) and has decided to try and measure the risk factors of criminal offences and offenders using a risk management process (for efficient crime control). In the context of risk management, the state has replaced consideration of the characteristics of individual offenders with factors that when calculated, provide a barometer of risk. In order to assess the risk of crime in a purely measurable fashion, the state/criminal justice system has decreased reliance on professionals and experts who would ordinarily focus on the individual characteristics of offenders. These individuals who once made decisions based on experience or research, now consider individual characteristics as abstract factors. The goal of the new risk management protocol that they are required to implement, is to assess risk based on rules to de-emphasize humanism and emphasize risk criteria (Castel, 1991: 281).

The danger of crimes is addressed through anticipating all possibilities of potential risk factors. Breaking crime and criminals down to risk factors is a bold move in that, it reduces the assessment process to a measurable science. This feat is possible because we are able to see the benefits of technological advances in society. Also, we treat crime as a normal part of modern consciousness, assuming that efficiency will be easier to achieve if we handle risk factors in a “businesslike” fashion. We are increasingly forming life and society around technological tools that is, applying the science of those tools to our social problems. As a result, we are slowly removing any hint of the former ‘personalization system’ that focused on individual needs (Castel, 1991: 282-283).

Legitimized by the current state of crime and control, risk management is a hard line approach that categorizes individuals according to their risk potential even before an act of non-conformity is committed. The state perspective is that risk assessment—the application of risk management—is to prevent the occurrence of serious offences. The hypothesis is if an individual commits petty theft today, there is a greater risk that they will commit murder tomorrow. As such, it is better to act now with severity than to be blamed for inaction and have to explain later. In its desire to ‘act now’, the state has implemented a number of new punitive measures—e.g. mandatory sentences and boot camps. If the state incarcerates first time offenders or ‘three-strikers’ they are, from their perspective, systematically preventing the further threat of crime on society by these individuals (Castel, 1991: 284), or, alternatively, systematically creating more hardened criminals.

By modifying Deterrence Theory, removing efforts to encourage informal social control, and undertaking risk assessments void of professional opinions about the individual characteristics of the crime and criminals, the concept of criminality has been redefined. My perception is that we have deemed those who are assessed as a risk to be considered as un-rehabilitative--if an individual has already committed a crime then the state must continuously monitor their activities. Another important component of risk management is the desire to initiate perpetual surveillance over society and its criminals.

DNA technology has offered the state and the criminal justice system a superior tool that can meet their requirements for effective and efficient risk management in that it offers

administrative efficiency and provides an opportunity to “perpetually” monitor high-risk individuals through the use of DNA databases.

DNA Technology

In the late 20th century police, banks, universities, stores, even families have established controls over society through mechanisms of mass surveillance, including video camera surveillance, photo radar, one way mirrors, etc. Equally observable since society has converted to a manageable liberal state, is the expansion of the scope of legislation, funding for law enforcement and expertise in forensic criminal justice. Technology and science have penetrated the walls of justice and are considered invaluable crime fighting tools. New technologies have facilitated the state’s venture to detect crime and incarcerate criminals with increased accuracy (Snider, 1998:30-31).

“A technology does not need to be a ‘machine’ in the conventional sense. Technology does not have to be artificial either, it may be naturally occurring. What determines its status as ‘technology’ is deliberate and conscious use of it by human agents” (Street, 1992:256).

Current trends in criminal justice illustrate a clear conceptual shift away from a human-based to a science-based approach. DNA technology has propelled this shift further and faster, leading some to say that technology rather than people is driving the process.

Karl Marx believed that human users, without whom technology could not be operated, controlled technology. Marx went on to explain, that the structure of a society and its ability to broaden and encompass change depends on how technology flourishes within it. To maintain some control over societies being exposed to technology, the State implements regulations and organizes in order to ensure that technology is being properly utilized (Street, 1992:260-62).

The use of DNA and the creation of DNA databanks, are regarded as progressive actions within a criminal justice system that has moved from a social control to crime control orientation. As society de-emphasized criminal rehabilitation in favor of punishment technology, this has helped meet the objectives of zero-tolerance and mandatory minimum sentences. These “tough on crime” strategies were intended to protect citizens by offering surveillance tools to detect crime and monitor criminals. The actions a society takes and the way technology follows is a key factor to understanding the relationship between the State and technology. The database and evidentiary factors of DNA technology, though quite intricate, are only a portion of a larger picture.

Two issues are pertinent to dealing with the criminal justice system’s shift toward a science-based approach to crime management. The first is that science and technology offer the potential for obtaining an objective truth. Since the criminal justice system and the public are aware of the system’s current inadequacies in gathering and employing evidence, scientific objectivity is welcomed. The hope is that DNA technology will offer the criminal justice system a better and more absolute proof of guilt or innocence than

have other forms of evidence. The expectations of this technology have already been established. DNA technology has been coined the “crime-fighting tool of the century” (Gerlach, 2000: 21-22).

The second issue relevant to the criminal justice system’s shift towards a science-based approach is that the criminal justice system currently lacks efficiency. DNA technology and databases greatly improve the level of efficiency. The justice system needs this science to improve their performance and meet the public’s expectations of safety. DNA technology in general and the implementation of databases in particular, enhance the productivity of solving crime. Productivity is increased when irrefutable evidence is available to identify a criminal. The use of DNA databases cuts down on the time and money it takes to apprehend a criminal, and the risk of offenders remaining at large (Gerlach, 2000:25).

With the evolution of DNA technology and databanks, the state has redefined crime prevention. The technology has instituted a new mode of surveillance where direct contact with the subject is not needed. Since it is impossible to eradicate risk the next best thing is to derive as much control as possible. DNA technology is the ideal way for risk management to fulfill the society’s desire for an ideal system of surveillance.

The progressive nature of DNA technology has political leaders scrambling for some form of control. Decoding the genome will give society the technology to decipher the most complex aspects of a human being. Studies show that in a few years, DNA samples

will be able to determine race or height and even the creation of a visual picture (Gerlach, 2000:25). This technology and all of its miraculous insights will have different effects on society. The only hope to prevent misuse is through regulation and limitations. The strategy to implement restrictions on what DNA can and cannot be used for, is similar to determining how much accuracy and efficiency we want in criminal justice. The issue is to determine who really has control over the development and advancement of technology.

Politics and Technology

With the astronomical possibilities of DNA technology, very little thought has been given to the character of the technology. Few have asked ‘what else is gene mapping capable of?’ There is more than one theoretical concept that can help determine the direction of DNA technology. There are several theories that this technology can be categorized into, but more importantly than just understanding the character of DNA technology, is determining the relationship between technology and the state. The boundaries of technology within the state will determine its effect on the public.

The properties of DNA technology can be found in the political changes that occur as the science advances. Similar to the history of gene mapping are the political implications of applying this technology to society. On the one hand, we can see that DNA technology has passed through the stages of “autonomous” technology and technical determinism. Both of these theories see technology as a driving force in human society; the only difference lies in their mechanisms. Gene-mapping technology has progressed through

the above-mentioned stages, retaining several of its original characteristics before reaching the present political choice model. How the relationship between the state and DNA technology develops, will determine what DNA will mean for the future (Street, 1992:263).

The concept of autonomous technology portrays DNA as a driving force with its own momentum in society. Gene mapping began on its own momentum, which at the time was beyond human control and consequently dictated human activity, including politics. The new research left society and the courts with little or no choice on judgement claims, about the accuracy of this technology (Street, 1992:263). The only research conducted about the accuracy of this technology was completed by a handful of scientists. As history shows, what occurred was one breakthrough automatically leading to the next, with the driving force of technology being technology itself. It is true that the advancements in DNA had been minimally affected by outside influences. Little has happened to disclaim DNA's ability to conclusively identify an individual. *Technical changes have invoked criminal justice changes.*

The theory of autonomous technology is based on the logic that technology dictates social changes, and how life is lived. The problem lies however, in that there are sometimes serious pressures to alter society to accommodate technological innovations. When a technology reaches the point where progress is relentless and society can no longer decide how it will be used, there is the need for some political control (Green,

1990:8). This is the way the state took current DNA technology under control, and set the regulatory guidelines for use.

It is at this point that the autonomous technology becomes overwhelming to society and the next phase of the relation between the state and technology emerges. Technical determinism draws along the same lines of autonomous technology, especially with respect to the representation of technology as the driving force for social change. The difference between the two conceptions occurs in the way the process works. Technical determinism theory postulates that technology sets the conditions for political systems and agendas without determining the policy output. Like determinism theory, DNA technology forces change on society, and sets the conditions for political regulation (Green, 1990:8).

Change, especially technological change, can appear to be implemented without freedom of choice. Like autonomous theory, soft determinists believe that some technologies cannot be resisted. The soft determinists' view perceives science and technology as an aid to structuring the political, economic and social world by creating options. In such cases, technological determinism preempts choice (Street, 1992:257).

Many civil libertarians have the soft determinist perspective that there was no choice in the creation of DNA databases. Although DNA is a valuable resource, storing genetic information on databanks is considered an invasion of privacy. The gains that are achieved by using this technology in society outweigh the freedom of choice.

The other side to determinism is based less on choice, and more on political process. Society depends on the political order, i.e the power relation. Let us call this, strong determinism where change comes from a dictated path of technology. Hard determinism is based on the idea that power, which structured technology, is so pervasive and far reaching that the notion of choice is elusive. This means that technology is independent because 1) it has its own logic, 2) develops in stages of evolution and 3) dictates an elevation of predictability. These three factors determine technology as an independent process (Street, 1992:263).

An example can be found in a large company with a highly demanded product. The current product process is efficient but not nearly at the level to meet with the consumers' needs. The technology of creating an assembly line is developed. If the company decides not to use this technology it would not merely be saying that its efficiency is optimal, but that it is liable to being overthrown by other competitors who would implement the technology. If the company reorganizes and utilizes the technique of assembly lines, it will redefine the business and more importantly the politics of business. Hard determinists realize that there is little choice in the matter. Supporters of this approach argue that we confuse choice with possessing the ability to make a choice. The whole concept of choice confuses people to the extent to which they believe in actual control over technological choices. In more instances, we are ruled by the technology that is allowed into the system (Street, 1992:266).

The last theory is called the political choice model. In any thriving state that is looking for the best solution to its needs, technology will be welcomed. The ways in which a technology will be implemented into society is based on its ability to fit in with the political structure. DNA technology is based on human need and political interest. The ability to satisfy needs, is the reason for developing the technology. In many aspects of life, we require the need for the best solution to a problem (Street, 1992:266).

When DNA technology was in the autonomous stage, people did not know what to believe about its truth or accuracy. At the determinist stage, the choice to use DNA technology was regulated by the state. As overwhelming as this science is, the regulation set by the state formed its use by agents within the justice system namely, expert witnesses, scientists, and forensic detectives.

With the advancements in DNA technology in the political choice model, the state's focus is on the external benefits, and minimal attention is paid to the disposition of society—only the larger political interests will be addressed. This is the relationship that DNA technology has formed with the state. The state is in control of DNA technology because it fulfills a need and the desire to control crime. The relationship between state and technology is overriding the relationship between the state and the people. The state has established technology to simply control the people.

The best explanation for DNA and its application in society, proposed by Thompson (1989), states that "the need to combine 'the action of the state,' the particular character of technologies involved in their context and 'the role played by key actors'" (Street,

1992:266). The 'key actors' have the power to use new technology and change policy to fit the criteria of need. The state and the more powerful in society will determine what, and the degree of, exposure society will have to technology. The state control of DNA has come with a new political agenda that is susceptible to change as technology advances. The political process also determines the priorities for technology.

With the benefit and control over DNA technology, Canada and the United States have legislated databanks to serve the interest of criminal justice. The continued advancement in technologies is to fulfill a need and implement control over something else. In this case, DNA technology fulfills the need for society to control identification of offenders who commit serious violent crimes. The power of control is in the hands of the criminal justice system (the state). The creation and implementation of a data bank creates and maintains ownership, power and control over society's offenders. This technology has provided the technological tool to create the ultimate control of a "risky class". In the past, the sole way to monitor criminals (risky class), was achieved by incarceration. Today perpetual surveillance of society's "risky class" will eventually be found on databases all across North America and Europe.

Summary

In the efforts to reduce crime occurrence, the state and criminal justice system has shifted from a rehabilitation model of control to managing and controlling crime. In the past, the criminal justice system worked in conjunction with societal institutions to prevent crime and rehabilitate offenders through the values and morals of informal social controls.

With the fear of crime rising and the public demands for better crime control, the state has employed a more efficient and effective way to address the issue of criminals and crime occurrence. The concept is to achieve maximum control and the method is employed with a modified deterrence model and implementing a risk management strategy. These two mechanisms combined, work to prevent crime before it occurs. The deterrence model works to prevent crime by increasing the likelihood of being apprehended and instituting stiffer punishments. Risk management uses an assessment strategy to determine the level of risk and seeks to control it before there is any further criminal behavior.

With advancements in technology, the state and criminal justice system have found an “ideal” way to have ultimate and unlimited control over those who are classified as a “risky class”. DNA science has come full circle through the stages of technological evolution and has established a relationship with the state as the mechanism to satisfy social needs to control and manage crime. The state has imposed regulations on the use of technology to address the need to control the “risky class”. DNA technology is the way the State and the criminal justice system can monitor those who cannot be incarcerated but pose some level of risk to society.

Chapter 2: the Criminal Justice System and the Citizen

This chapter examines the State's and the public's conceptual climate in terms of criminal justice. This chapter also examines which crimes the state seeks to control most intensely, who is most likely to commit those crimes, and what the punitive outcomes are (i.e. levels of incarceration). Particular attention will be paid to the new operational policies implemented with the goal of managing crime, justice and criminals more efficiently. These include "public-minded" prevention, "contracting out", surveillance, and DNA technology. The data provided focuses primarily on the United States but reflects Canada since similar social and political policies have been implemented.

Conceptual Climate

Security is a central preoccupation in western states concerned with protecting the safety of its citizens and their property. The role of the government and the law is to achieve a level of security that is structured by conventional ideology. Current crime control policies are reflective of a conservative "law and order approach" (Martin, 1995:26).

The classical theory, based on rational choice—individuals seek to maximize their self-interested goals even if it means criminal activity—is the underlining assumption of the 'tough on crime' approach. The individual should and is held accountable for criminal behavior. Other theories, such as the socio-economic theory of behavior, suggest that individuals are influenced by external economic factors such as responsibility, commitments, and necessity and are not solely self-interested. In the current climate, the State overlooks these and many other alternative theories that provide alternative

explanations for crime or criminal behavior in favor of a risk management approach (Fisher, 1993:177).

Liberal ideals of decriminalization and decarceration have been replaced with an orientation toward containment, mandatory sentences and maximum duration of incarceration. The system which once 'defined down' criminal activity is now firmly waging its "war on crime" with a hard line approach. Risk management has been applied by the criminal justice system as the efficient reliable way to assess risk from identification of risk and crime to the containment of criminals. The intention is to cast the net as wide as possible in order to prevent crime, manage crime where it has occurred and monitor populations identified by the state as having a high-risk for criminal activity. The result is that the criminal justice system tends to focus on specific crimes perpetrated by specific groups. These groups are then considered to be high-risk populations and may become targeted for surveillance resulting in a high potential for incarceration by the criminal justice system (Snider, 1998:33).

In pursuing its hard-line approach the state has also encouraged the public to become involved in increased surveillance and monitoring of crime and criminals. For example, business people have installed monitoring devices, and taken advantage of reduced insurance rates for patrons with anti-theft devices on their cars and homes. Meanwhile the State has increased the number of police officers on patrol and has legally instituted DNA databases for storing samples of genetic material. The deterrent effect of surveillance in the quest for a manageable state, is the fear of being apprehended for even

minor criminal activities, and the knowledge that being caught will more likely result in incarceration. Further, introducing DNA technology into the 'war on crime' and establishing DNA databanks, provides an opportunity for the state to perpetually survey populations considered high risk. Only a selected few would be removed from the groups that would be considered "risky".

The government is able to include DNA technology into the criminal justice system because there is public support for the 'tough on crime' approach. As part of the process to control crime, the public has very strong feelings about how the criminal justice system should be managed. The public's fear of crime has made people angry with perpetrators and impatient with leniency in the criminal justice system. The public wants and supports lengthy sentences for criminals, wanting them to experience the same anguish and suffering felt by the victims of crime. The overall perception is that criminals "ought to benefit less from society's bounties than the worst off of law abiding citizens" (Gomme, 1995:490)

Managing Crime, Justice and Criminals

Under this new method of risk management there have been wide ranging changes to the application of laws and policies designed to manage crime. Risk identification, evaluation and control, three stages of risk management, are being used for assessment purposes at each stage—from arrest to sentencing, within the criminal justice system. Among the outcomes of using risk management for assessment purposes is the development of improved policies and frameworks for incarceration including the

establishment of “Boot Camps” for first time offenders and “Three Strikes You’re Out” policies for repeat offenders.

Boot Camps are intended for first time offenders as a specific deterrent to crime, but more to rehabilitate. The philosophy is to organize, punish and deter crime by subjecting the criminal to a tightly controlled environment of hard physical and mental conditioning, and summary punishment from the staff in the form of physical exercise or extra duties for disciplinary infractions. The goal is to encourage first time offenders to forsake the criminal lifestyle (Zacharia, 1996:4).

The duration of punishment is determined by a judge based on the severity of the offence, but the level of intensity is the same for all. In the Boot Camp environment the offender is responsible for their actions and is expected to adjust their behavior to accommodate stated rules and regulations. Penalties for infractions are standard. The assumption is that if first time offenders are subjected to deterrent education, are supervised from morning until night and must be on their best behavior, the risk of recidivism will be reduced. By decreasing the risk of recidivism supporters of Boot Camps believe there will be less crime and less future costs to the State. After Boot Camp experience, those who are assessed by officials as at risk for re-offending, are subject to continued surveillance after their formal release. In accordance with Risk Theory some offenders may be further sentenced to continue deterrence education, live in halfway houses or receive regular visits from state officials mandated to monitor the individual, and ensure a proper transition back into society (Zacharia, 1996:4-8).

In a further attempt to control high-risk populations, fourteen American states have introduced tough new legislation. This formalizes the current hard-line punitive approach to criminal justice in that serious and repeat offenders may be permanently incarcerated. There are various models for the “Three Strikes” law, as it is called, however I will be referring to the California Proposition 184-Nov. 1994 since it is the policy model to which several other states have subscribed. A statute with a similar premise of unconditional incarceration like “Three Strikes” exists in Canada. Under the Canadian statute a habitual criminal can be declared a “dangerous offender” by the courts and subjected to indefinite incarceration (Shichor, 1997:470-474). Although the Canadian legislation is different in the fact that it does not include minor infractions found in the American three-strike legislation, the indefinite incarceration is meant for habitual serious offenders.

The policy of the “Three Strikes” legislation is that the once “two strikes” are accrued for felony offences a third felony will result in a life sentence. The law also doubles sentences for a ‘second strike’ and requires that the sentence be served in a prison (as opposed to in jail or on probation). Further, the possibility of release for good behavior is reduced from 50 percent to 20 percent of the sentence handed down (Grenwood, et., al. 1994:1).

The Three Strikes policy is the point at which the linkages between the ‘tough on crime’ approach and the risk management method to crime control are most observable. The policy is based on the notion of general deterrence—the offender will be deterred from

offending under the threat or consequences of lengthier sentences or indefinite incarceration. The benefits of this policy in a risk management structure will be, it is hoped, both short and long-term reductions in crime and the costs associated with various components of the criminal justice system. Though the 'Three Strikes' law has been in existence since the 1970s, in the past 10 years, the number of times it has been enacted has increased dramatically (Grenwood, et., al. 1994:3).

Corrections and Criminal Justice

The majority of Canadian and American inmates are convicted and incarcerated for minor offences—property crime, drug offences and victimless crimes. In the United States, the War on Drugs has largely contributed (approximately 40 percent) to the prison and jail populations that totaled 1.7 million inmates in 1996. In Texas the prison population is larger than that of France and equal to that in Germany where the nation's population is over 80 million people. The number of inmates in California alone means that 1 in 6-state employee's work for correctional facilities (Chaiken, 1999:5).

“Let us be clear: wars against crime are primarily wars against the poor, uneducated, young and the visibly different men” (Snider, 1998:36). The types of crime state agencies and institutions of criminal justice choose to monitor for risk factors can result in increased numbers of lower class citizens being put through the system and ending up incarcerated. Property crime, drug offences and victimless crimes tend to be committed by those who are financially deprived. Regardless, from a risk management perspective these individuals need to be controlled because they are high-risk. The result of being

identified as high-risk coupled with maximum and mandatory sentencing, are prisons that are over-represented with young minority males who have little education or stability (Snider, 1998:38).

In Canada, statistical data collection about the racial designations of inmates is fairly recent. Statistics show an overrepresentation of Aboriginal people incarcerated within Canada's federal, provincial and territorial correctional institutions. Aboriginal persons represent approximately 1.5–2 percent of the Canadian population but constituted 15 percent for provincial/territorial prison admissions, and 17 percent of federal admissions in 1997 (Juristat, 1997:6). The impact of sentencing practices and maximum duration of incarceration are evident in Canada by the fact that statistics for federal Aboriginal inmate populations rose 5 percent for federal admissions and declined by 2 percent for provincial/territorial admissions from 1993 to 1997 (Roberts & Doob, 1997:472-73).

Studies show similar patterns for Blacks who account for 2 percent of the Canadian population yet represent 5 percent of admissions to federal penal institutions. At the provincial/territorial level, because of a lack of accurate race data, we can only say that in certain provinces like Ontario, Blacks and "Arabians" account for more than 16 percent of the total inmate population (Roberts & Doob, 1997:374).

In the United States, a more profound over-representation of certain racial groups is apparent. Between 1985 and 1995 the increase of Black men in prison for drug offences alone, rose by 700 percent. Similarly, the Hispanic prison population quadrupled since

1980. In 1996, correctional statistics showed that one in every three—a total of over two million—American Black men were under some form of correctional supervision (Chaiken, 1999:8).

The similarities between the Canadian and American prison populations go beyond race. Research demonstrates that North American prisons are over-populated by young, poor and uneducated inmates. In 1997-98, the median age for Canadian inmates was 32 years of age at the provincial/territorial level and 33 at the federal level. Thirty seven percent of Canada's inmate population has an educational level at grade 9 or less, this in comparison to the general population where only 19 percent have an education level below grade 9. Prior to incarceration, offenders also have a significantly higher level of unemployment (52%) than does the Canadian adult population (10%) at large (Juristat, 1997:12).

In the United States, the average age of prisoners is 20-29. This is representative of a growing number of offenders who enter the prison system at a very young age. In 1991, American correctional facilities reported that 33 percent of inmates were unemployed prior to arrest—an increase of 3 percent from 1986. A little less than half of the prison population, 45 percent, did not have full-time employment before prison. Statistics indicate that 13 percent of men and 38 percent of women behind bars were on social security, welfare or some form of charity before incarceration (Harlow, 1998:12-13). If Black males in prison were factored into the jobless rate of Black males in free society, the unemployment rate would rise to approximately 18 percent (Currie, 1998:22).

The groups discussed above may be more prone to commit crimes and face imprisonment because they are poor and uneducated. This is not to suggest however, that upper class, educated citizens do not commit crimes. White color crime is simply harder to detect and in certain instances is considered a “normal” element of business (Synnott, 1996:137-38). Upper class citizens are more likely to commit crimes that could go unnoticed, such as falsifying documents to get government grants, paying employees less than minimum wage, false advertising and fraud. The offences committed by the affluent citizens of our communities include pollution, unsafe product manufacturing and unsafe work environments. These activities often go unnoticed and unpunished; and fortunately for these citizens, cutbacks have directly affected the governmental bodies that are mandated to regulate and enforce action against such criminal behavior (Snider, 1998:40).

The social impact of white-collar crime can be more destructive than the crime that is frequently reported in the media. White-collar acts of violation lead to public distrust and “produce social disorganization” (Synnott, 1996:137). The cost to lives and financial damages without accountability for corporations simply means that two systems of law exist: one for the rich and one for the poor. White-collar crime is about profit, even if it engenders breaking the law (Synnott, 1996:138).

The use of a risk management method to crime control has undoubtedly affected prison populations in North America. In fact, not only are these high-risk offenders being monitored through incarceration, there are thousands more outside the walls of correctional facilities on probation, parole or being monitored using new technologies

such as ankle bracelet electronic monitoring devices. For those individuals who are not being monitored directly, but are assessed as a potential risk, the State may now register them in DNA databases.

In light of the current conceptual climate and the method we are utilizing to manage crime and criminals, it is not a surprise that North America has an increasing prison population. More importantly, by assessing the characteristics of these prison populations we can see similarities that go beyond the fact that they have been convicted for committing a crime. The new 'tough on crime' approach is primarily concerned with high-risk factors and not with the social characteristics of offenders.

Surveillance Framework

We have seen how the 'tough on crime' conceptual climate and management practicalities of risk theory have changed how crime is controlled. These changes have also had a noteworthy impact on the surveillance frameworks employed by the state, with the help of the public, aimed at reducing the occurrence of crime and minimizing society's fear of crime.

The public is doing their part to control crime by creating their own forms of personal risk management and surveillance. Their orientation is to reduce risk by avoiding threatening situations, increasing personal protection and minimizing losses that could occur from victimization (Fisher, 1993:179).

For years women have employed risk avoidance strategies, such as doubling up to walk home in badly lit areas, to protect their personal safety. This practice has now broadened to include most of society. Schools and communities have created walk patrols so no one has to be alone in unsafe areas. Technology has also been introduced to facilitate personal risk reduction. "Target hardening" incorporates a variety of personal and practical tools and strategies that make it more difficult for an individual to be victimized. Devices that can be used to keep you and your property safe include debit cards and credit cards as well as a variety of car locks and home alarm systems (Fisher, 1993:178). Citizens have also found ways to prevent and detect crime through community controlled surveillance strategies such as public minded "Neighborhood or Block Watch" programs. Research shows that 80 percent of citizens adopt some form of private crime prevention strategy (Fisher, 1993:179). Community initiatives against crime bring out social solidarity and a sense of cohesiveness that further reduces the fear of crime. The closeness that joint action encourages motivates the community to continue collective participation as a means to making the environment safer for the group (Fisher, 1993:181-183). Neighborhood efforts to increase group cohesion as a means to preventing crime are encouraged by the police and local authorities.

In the face of successful Neighborhood Watch programs, police have incorporated problem solving and community policing. The police want to have an ongoing presence in the community as a means to further deterring criminals. By creating a police-public nexus the officers get to know the community and the people get to know the officers.

The trust between the police and the public ensures that both groups continue to work toward reducing the risk and fear of crime (Fisher1993:184-185).

With community policing and a relationship of trust with citizens, police can assess risk factors more readily. Also, with an ongoing police presence in their community, there is now a new “in home” venue for citizens to report activities that may be criminal. The information police receive from citizens is invaluable to the risk assessment process. By locating themselves within the community, the police are able to carry out surveillance activities under the cloak, and with the cooperation, of the community (Fisher, 1993:194).

As beneficial as community policing and neighborhood cooperation have been in the surveying and deterring crime, “public-minded” prevention and police community initiatives are being quickly replaced in areas where protection and security can be purchased. To reduce the costs of managing crime, the state is increasingly hiring private security companies to carry out deterrence, surveillance, and detection functions. By contracting out these functions, the state no longer has to concern itself with human resource and benefits issues (McMahon, 1997:3).

The luxury of contracting out for security services is also allotted to those with the power, privilege and wealth who can pay for “peace of mind”. Personal security for hire can be found in gated communities, security systems and private policing (McMahon, 1997:3).

In addition to community involvement as a tool to win its “war on crime”, the state also realizes the need for technological tools. The high tech revolution has been embraced by the criminal justice system. The state is the largest consumer and initiator for specialized sophisticated equipment designed to enhance their ability to detect risk, pursue, apprehend, convict, and control criminals. The criminal justice system has already experienced numerous benefits in crime control and management with technologies such as fingerprinting, breathalyzers, radar traps and so forth. These technologies offer efficiency and a level of reliability of evidence not previously enjoyed in crime control (Gomme, 1995:490).

Equally important are electronic technologies such as recording devices and video monitoring cameras, the evidence from which have the ability to solidify a case with visual depictions of criminality. These same monitoring and recording devices have also impacted the penal system in North America in that they offer correction departments alternatives to incarceration. Tracking devices can be used to keep criminals within given parameters without relying on walls and bars. These devices are so sophisticated that if an offender exits a given geographical area, or does not report to a specific location, a signal will alert authorities and the offender’s movements can be tracked (Gomme, 1995:491-492).

Electronic tracking devices, breathalyzer and fingerprinting technologies have been useful crime controllers; however, none of these technologies are as accurate as DNA technology. DNA is the most advanced scientific tool being used to fight crime. With all

of the changes and criminal justice system has incurred, the tool that offers the greatest possibility of keeping track of criminals and those with high-risk factors is DNA technology. Through the creation of DNA databases, the state will be able to count perpetual surveillance among its arsenal to manage and control crime.

Crime Control and DNA Technology

Two factors must be considered when using DNA technology within the criminal justice system. The first is economic based and deals with increasing costs of crime control. The second is policy based and consider the optimum utilization of DNA technology.

The 'war on crime' is not the United States' first campaign of zero tolerance—a similar war is being waged on drugs, and the economic implications are staggering. The American anti-drug budget has grown from roughly \$53 million in 1970, to approximately \$10 billion by 1997. Since 1970, the United States has invested about \$77 billion in domestic and foreign drug enforcement activities and personnel (Bertram & Sharpe, 1997:80). Apart from the direct cost of the war on drugs, the American people endure hidden expenses such as, a portion of the \$200 billion spent on health care for HIV infection and wounds received in the drug war (Califano, 1994:98). Equally costly is the increased incarceration of inmates in state and federal facilities. It costs anywhere from \$20,000 to \$40,000 US to house an inmate per year (Wisotsky, 1993:72). The question that remains unresolved is what the overall success of the war on drugs has been given the large amount of resources being expended to eliminate illegal substances. To

date no firm figures or assessment of how close the US is to winning the 'war on drugs', is available.

The 'war on crime' has enjoyed a large budget—though no firm numbers about direct spending have been aggregated. Figures that are available speak to spin-off economic gains stemming from increased concern with deterring crime and increased incarceration rates. For instance, the private security industry has enjoyed a boon since the 'war on crime' went into full maneuvers. In 1994, private security agencies made profits of \$70 billion dollars by supplying surveillance manpower, and home security systems (Bertram & Sharpe, 1997:81).

Correctional services have also experienced economic gains. Prison development involves significant amounts of money for those making the investment, building the edifice and supplying equipment. "In 1990, total per capita and operational expenditures by country, state and federal correctional systems were estimated to be more than \$25 billion US" (Christie, 1993:98-99). In the face of large expenditures, similar to those of the 'war on drugs', and 'a tough on crime' philosophy, no assessment has been made about how close the US is to winning the 'war on crime'.

Technology is an integral component in the 'war on crime'. Recently, DNA technology has taken center stage, and is touted as the tool able to win the war while ensuring that no innocent people are incarcerated. At issue is whether the state can effectively use the very costly technology and deliver on these high expectations. Equally at issue is

whether a system that has implemented a risk management method to crime control can overcome the procedural and ethical problems that persist among some agents and agencies of the criminal justice system.

Even though the United States and Canada are experiencing lower crime rates, the need to accurately and openly assess the mistakes of prior crime policies remain. By introducing DNA technology into the criminal justice system the State is trying to make the system work more efficiently and effectively without a concrete analysis of where the system is inefficient and ineffective.

A systems analysis of crime control identifies that the state is well aware of its inputs (money, manpower, policy, etc.), and its outputs (crime or incarceration). Where the state is lacking is in being able to fully account for activities within the system and in obtaining pertinent feedback. Currently, feedback into the state is minimal and very selective. The criminal justice system cannot continue to implement policies without seeking clarity about the system's past failures or obtaining comprehensive feedback.

Use of DNA evidence within the criminal justice system to date, demonstrates that the technology is most often used as a tool to facilitate the conviction of offenders. As such, the state cannot consider DNA technology or any other crime-fighting tool as an absolute way to win the war on crime, because there is no guarantee that the technology will be used appropriately. To demonstrate some of the limits the use of DNA in the 'war on crime' will face I will examine some of the shortcomings of the war on drugs.

The American public has endured both social and monetary losses that are directly attributable to the 'war on drugs'. Cuts to healthcare, an over-burdened criminal justice system and an incarceration rate that is the highest in the industrialized world, are key outcomes faced by the American public as a result of the 'war on drugs'. Despite the hardships born of the strategic drug war, there is no clear indication of a reduction in the use or abuse of drugs in the United States. In fact, it has been argued that the war waged by the state has created a multitude of other social problems such as increased violence, premature death, unreported disease, poverty, and an overall degeneration of the American family. Even with tougher crime legislation and border enforcement, there is no evidence that there has been a decline in the amount of drugs coming into the USA. In actuality, the prices of cocaine and heroin have dropped since 1981 indicating abundance in supply (Bertram & Sharpe, 1997:82).

When the 'war on crime' and the 'war on drugs' are compared, a similar absence of a clean and clear political objective is observed. The absence of a clear political objective, identifying a path for DNA technology to attain victory in the war on crime is problematic. The problem lies in the concept of "war" on "crime" per se. This strategy indicates that the means must aim at achieving a specified political end. In the case of the 'war on crime', DNA has been identified as the means. What is missing is firm criteria for what constitutes the full attainment of the political objective—the end (Bertram & Sharpe, 1997:82).

No war should be thought of as an end in itself, a strategic analysis must identify both a political objective and clarify the method that will be able to meet this objective. The war on crime's political objective is obscure, the method-risk management fails to consider the human dimension of crime and so, the means—DNA technology cannot be said to be able to effectively win the war on crime (Bertram & Sharpe, 1997:83).

Summary

Our society is preoccupied with security of person and property. More importantly, the public is fed up with crime. These two factors are the driving force for the “tough on crime” approach and the concept to “waging a war on crime”. The outcome of new strategies and thoughts on how better to deal with crime and criminals have created hard-line policies like Boot Camp for first time offenders and “Three Strikes” laws for repeat offenders.

The hard-line approach has increased even though crime rates are decreasing and statistics indicate that prisons are swollen with petty criminals. The overpopulation in prisons across North America indicate that the “tough on crime” policies are using incarceration as a primary means of crime control.

The approaches, policies, strategies, and so forth, to control crime have spread throughout society to include private citizens. The public is participating in public-minded prevention strategies like “Neighborhood Watch” or “Save Our Streets”. People have even devised their own personal risk management strategies to reduce the likelihood of

victimization and minimize their loss. The need for security and the burden of having to protect your own property has extended to contracting out for security service. For those who can afford personalized prevention it is available in gated communities, home security companies and surveillance equipment.

The public is worried about their security and is taking an active role in prevention. However, waging a “war on crime” with DNA technology as the means to an obscured end, has the same conceptual flaws as the “war on drugs”. The goal of eliminating drugs did not and has not worked, yet the government is taking a similar political stance with actions in the war on crime and DNA technology is the means. The public and the state can only continue to combat crime because there is no likelihood of crime ever disappearing.

Chapter 3: History of DNA Technology

This chapter will examine the history of DNA technology. Discussed are the key actors in the discovery of gene mapping and DNA fingerprinting. This chapter goes on to examine several cases where DNA evidence was used to convict or exonerate an individual. I will describe the development of legislation for the use of DNA technology and discuss the privacy implication.

The Discovery of DNA

The political and public controversy over DNA research has brought out advocates on opposing sides. A number of groups, political parties and citizens have debated the worth of this technology. In June 2000, Canadians will see just how far policy-makers have gone to ensure public safety and peace of mind regarding the elimination or prosecution of suspects. The implementation of DNA science is inevitable; at issue, is how politics will control its use.

A case brought before the courts for criminal proceedings usually consists of a victim(s), suspect(s), and evidence. In addition to evidence supplied by eyewitnesses, criminal proceedings rely on physical and circumstantial evidence.

Physical evidence consists of blood, fibers and other materials, and are presented in criminal proceedings by forensic scientists or criminologists who perform complicated tests in order to present testimony based on science. Circumstantial evidence deals with creating a scenario that explains why a crime occurred. Much of the circumstantial

portions of the evidence are left to police and prosecutors. The goal of examining evidence is to build connections between the accused and the crime scene.

Science and criminal investigations have been working as partners in the criminal justice process for many years and through millions of cases. Over time physical evidence has matured to the point where it no longer can be reduced to fingerprints or bodily fluids. Technological advancements have enhanced the ability to match footprints, tire tracks, bite marks, hair, fibers, and so forth. Forensic pathologists can now determine exactly how a victim died by examining blood spatters on a wall or the way the victim is positioned. Expertise can now determine the time of death by examining the insects that have infested the victim's body, or the degree to which food has decomposed in the stomach (Rangle, 1995:2-3).

Fingerprints or blood type were once the strongest evidence available to place a suspect at the scene of a crime. If there is a suspect available for comparison, a complete fingerprint at a crime scene could go a long way to establishing the prosecution's case. Despite the fact that fingerprints are unique to each individual, reasonable doubt could always be cast on the circumstantial evidence--how the fingerprints came to be at the scene. As such, fingerprinting cannot be regarded as an absolute indicator of guilt or innocence. This remains the case even though fingerprinting science has evolved. Police agents are currently able to retrieve fingerprints from skin and material. Even partial fingerprints can be submitted into databanks able to find possible suspects in seconds (Rangle, 1995:77-78).

Bodily fluids such as blood, semen and saliva are damning pieces of evidence in any criminal trial. Police and prosecutors have built criminal cases and secured convictions using such physical evidence. However at the time, bodily fluids were only able to classify a suspect into a blood type category, which can include millions of other suspects. Prior to Professor Jeffrey and the infamous British case, no blood, semen, saliva, or hair samples could positively identify an accused as the sample donor (Rangle, 1995:19-20).

The discovery of DNA cannot be credited to Professor Jeffrey alone. The research history of DNA, (deoxyribonucleic acid) began in 1868 with Friedrich Miescher- a Swiss biologist studying the nuclei of cells. The studies carried out by Miescher were on discarded bandages but this is where he discovered a phosphorus-containing a particular substance he decided to brand nuclei. The nuclei consisted of an acidic protein, known today as DNA histones--the class of proteins responsible for DNA packaging. Miescher found similar substances in salmon sperm, and although he was able to separate the nucleic acid fraction and study its properties, the concept of cell inheritance--or simply--the structure of DNA was unknown till the 1940's (Biotechnology Industry Organization, 1990:2-3).

In 1943, at the Rockefeller Institute, Oswald Avery, Collin MacLeod and Maclyn McCarthy discovered the first evidence that DNA was the carrier of genetic information. The scientists realized that DNA taken from the virus bacteria Streptococcus Pneumonia and transferred to a non-infected cell eventually merged with the new cell. Avery and his

colleagues realized that the genetic message of the disease was incorporated in the DNA of the cell. Even though the assertion was not well received, the research continued. In 1952, Alfred Hershey and Martha Chase showed, by way of radioactive experiments, that when a virus infects its host cell, the DNA of the virus enters the host cell and the genetic information provides information for the replication of the virus (Biotechnology Industry Organization, 1990:2).

Understanding that DNA is the carrier of genetic information, the question of how this genetic information was passed from one generation to the next lingered until 1953. This is when American geneticist James Watson and an English physicist Francis Crick, working at the University of Cambridge in England, proposed that DNA has a double helical structure. The double helical structure would prove to be the secret to molecular biology and the modern biotechnology that has brought DNA technology to its present use. Watson and Crick began with past research, incorporating newly developed theories as if piecing together a puzzle (Biotechnology Industry Organization, 1990:3).

The X-ray differential studies conducted by Rosalind Franklin and Maurice Wilkins at King's College (London, England) led Watson and Crick to produce a three dimensional model of DNA. The newly structured model explained how DNA replicates information transferred from parental genetics. The parental strand of DNA is used as a template and the molecular structure of the other two strands, shows how it is transferred to offspring. This discovery earned Watson, Crick and Wilkins the 1962 Nobel Prize for Physiology and Medicine. Rosalind Franklin was also part of the prize-winning team.

Unfortunately, he died before the award was presented (Biotechnology Industry Organization, 1990:4-5).

The history of gene mapping brings us back to Professor Jeffrey and an infamous case in Narborough, England. Jeffrey studied biochemistry at Oxford and was very interested in the application of biochemical techniques and genetics. His break-through in gene composition research came in 1975 when he was chosen to work on a project to isolate mammalian genes in Amsterdam. His tenacity was relentless and, it was as a professor at Leicester University in England that he discovered the key to DNA, every chromosome has its own distinct small piece of DNA. When these DNA fragments were placed on a gel substance and examined under radioactivity, specific pattern molecules appeared. No two formations had the same pattern, except for twins. Yet, one was able to identify family members because they would share certain traits in the molecular pattern. From these developments, Professor Jeffrey coined the term DNA fingerprinting (Science Watch, 1995:1-2).

The British murder case that publicized Professor Jeffrey's research and probably the idea behind creating a DNA database, occurred in the small English village of Narborough. Between 1984 and 1986, two 15-year-old high school-students were raped and murdered. In 1986, the police received their first break when a local man, who worked at a mental institution, confessed to the second murder. The problem was the man categorically denied having any part in the first murder. Police were fairly sure that

the same person committed both murders. The next step was to find a way to establish their suspect's guilt for both murders (Adler & McCormick, 1998:1).

The police sent samples retrieved from the two murdered teens and a blood sample from their suspect to Dr. Jeffrey after hearing about his research. The first ever DNA test came back negative. Rodney Buckley, the suspect police had in custody was not the murderer. The DNA test disclosed what the police knew all along that the same assailant murdered both girls. With the only suspect eliminated, the police decided to ask every male 13-35 to voluntarily give a blood sample in order to be eliminated as a potential suspect. This was the world's first DNA manhunt. Police collected over 5000 blood samples to be sent to Forensic Laboratories for DNA analysis. It was only a matter of time before the true assailant would be brought to justice. (Adler & McCormick, 1998:1-3)

The real killer, Colin Pitchfork almost eluded the manhunt by getting a friend to give blood in his name. The plot was overheard at a local pub and the police were notified. Pitchfork was arrested and his blood test was a perfect DNA match to the sample from the victims. He was convicted and is currently serving two life sentences. This first case set the precedent for the power of Dr. Jeffrey's work and the many other criminal cases that would be based on DNA evidence. The Pitchfork case showed both sides of using DNA evidence within the criminal justice system: it has the power to convict and the power to acquit. The Narborough case was the first in which DNA fingerprinting proved an individual's innocence (Adler & McCormick, 1998:1-3).

DNA was first used in the American criminal justice system in Orlando Florida 1987.

Based on DNA evidence Tommy Lee Andrews was convicted of a series of sexual assaults. In Canada, the first use of DNA to exonerate came a few years behind the USA when an innocent man was freed after spending 23 years in prison (Adler & McCormick, 1998:3).

In January 1969, David Milgaard was arrested for the brutal rape and murder of a nurse in Saskatoon. David just 16 years old when the murder occurred, was found guilty and jailed at the age of 17. In the 23 years he spent in jail, Milgaard never stopped pleading his innocence. In 1988, a forensic pathologist examined the evidence found on the victim in the case and judged the sample to be contaminated. The sample should not have been used as evidence and instead should have eliminated Milgaard as a suspect. Regardless of the new forensic evidence and the insurmountable evidence of coercion and misconduct in the trial, Justice Minister Kim Campbell denied Milgaard a review of his case in 1991. Joyce Milgaard, the convicted man's mother, was relentless in her efforts to free her son. Prime Minister Brian Mulroney was on a visit to Winnipeg when David's mother confronted him. He would not repeat Campbell's mistakes and offered her his support, by stating that he would speak to the Minister of Justice. Two months later, Kim Campbell instructed the Supreme Court to reopen the Milgaard case (Anderson & Anderson, 1998:51-54).

At Milgaard's hearing (to determine if a new case would be held) the Supreme Court Judge began by stating that David Milgaard received a fair trial. Apart from the obvious

prosecutorial and police misconduct, which will be discussed further in chapter four, the courts believed that the evidence of another suspect-Larry Fisher-would have raised reasonable doubt during the trial. The court's verdict was to quash the past verdict and order a new trial. On April 17, 1992 at the age of thirty-nine David Milgaard was released from prison. The Crown refused to file a motion for a new trial for David Milgaard and there would be no opportunity to prove his innocence. Fortunately DNA evidence conclusively proved Milgaard was not the killer of the Winnipeg nurse (Anderson & Anderson, 1998:59-60).

Milgaard's official exoneration came after the infamous OJ Simpson trial (1995), when DNA evidence was introduced in an open court. In preparing for the OJ Simpson case the Los Angeles police department made many errors that expert witnesses could not deny under cross-examination. The quality of the collection of evidence, the meaning of the analysis results, and the probabilities of accurate identification were open to scrutiny. In the Simpson case, the collection and handling of the evidence came into question; the science however, was never questioned (Walsh, 1995:1).

The decision to use DNA evidence in the OJ Simpson case came after the presiding judge heard testimony from "non-biased" experts on the ability of the evidence to accurately identify the killer. Judge Lance Ito decided that the evidence was admissible and expert witnesses for both sides gave testimony as to the probabilities of the DNA evidence matching that of the defendant. Once the trial was over, the final decision was left in the

hands of the jury. The fate of OJ Simpson was determined, according to prosecutors, by the jury's lack of knowledge about the biology and chemistry of DNA (Walsh, 1995:2).

Science and technology have revolutionized our lives and have brought society to the pivotal point being examined in this thesis: the effects of science and policy making on the criminal process.

The introduction of DNA evidence has been a powerful tool in the criminal justice system. British and American success with DNA evidence to convict serious violent offenders, offers Canada first hand examples of the validity, need and accuracy of DNA technology. Based on Jeffrey's work in North America, independent labs offered police the avenue to test samples from victims and suspects. By 1989, the FBI and the RCMP's Ottawa Center for Forensic Laboratories began doing casework themselves- not long after the Toronto and Montreal Police Science labs began accepting cases (Phillips, 1998:6).

The North American technique is called "Restriction Fragment Length Polymorphism" (RFLP) typing (Department of Justice, 1995:1-2A). Police quickly realized what they had was a technology capable of typing all cellular material including semen, white blood cells, hair roots, saliva, skin, bone marrow and bone. Mixed samples (except for red blood cells) could also be typed using this method. Samples need not be large for the technique to work, identification is possible with miniscule quantities of substances. DNA technology gave police officers power in that they are now able to exclude a

suspect, identify a perpetrator, victims (in cases of decomposed bodies or simply body parts), identify substances left on a crime scene, or identify a suspect by substances found on him/her from a crime scene (Phillips, 1998:6).

The courts in Canada have accepted the extended studies conducted by the United States Office of Technology Assessment (OTA, the analytical arm of the U.S. Congress) and, more recently, by the National Research Council of the United States National Academy of Science. These studies proved the reliability of DNA evidence and contributed to the fact that DNA evidence is currently admissible in Canadian courts. The national effort to establish a DNA databank however has placed the country in the midst of another controversy (Department of Justice, 1998:1B).

The government's goal during the discussions about DNA databanking processes was to bring Canada's crime-fighting technology up to par with the U.S. and Britain, without infringing on society's civil liberties. There were many groups, both defending and refuting the establishment of databanks. The process of creating DNA policy would be a long grueling procedure with compromises requested from both sides. Borrowing significantly from the British and American model, the Canadian government wanted to remain distinct in the way it would obtain, regulate and bank the DNA samples and laboratories.

The concept of banking information on criminal suspects for future investigation is not new in Canada. Under the Identification of Criminals Act, Canada has a legal right to

keep a suspect's or convicted criminal's fingerprints. This legislation offered a precedent for the DNA database initiative.

In 1994, twenty-one states in the U.S. enacted legislation and seven introduced bills on storing DNA. At the same time, the FBI created CODIS, (Combined DNA Index System) the first North American data banking system. By storing profiles, police have an avenue to begin an investigation when they don't have a suspect and can access information for the reinvestigation of old cases. The long-term benefits of databases are overwhelming (Department of Justice, 1998:18). The criminal justice system would be effectively offering the public maximum protection, police investigations would be concentrated and the congested court system would be eased because of increased guilty pleas. The use of DNA evidence would also have a deterrent effect on those prone to committing serious offences.

Britain has had an operating DNA databank since April 1995. Under the Criminal Justice Public Order Bill, Britain is expected to process approximately 135,000 samples per year. The British DNA database has already had overwhelming success with "cold hits" and "cold cases". The cost of each DNA analysis is assumed by the individual police force requesting the analysis. Although the majority of American states have DNA databank legislation, without funds, nothing can be established. This problem will be alleviated since the 1994 Federal Crime Bill offers federal funding for those states that meet proficiency-testing standards (Solicitor General Canada, 1998:12A).

In early 1990, the Solicitor General of Canada and the Justice Minister published a working document entitled "Obtaining and Banking DNA Forensic Evidence". The document raised some of the issues that the creation of a databank raises, and incorporated the public's views on creating a DNA warrant proposal and laboratory regulations (Solicitor General Canada, 1998:1A).

A call for views and feedback was distributed to Members of Parliament, provincial and territorial governments, police agencies/organizations, correctional institutions, privacy officials, women's organizations, the legal community, victim's groups and forensic science/genetic organizations. In July 1995, the Solicitor General and Department of Justice enacted Bill C-104, the DNA warrant legislation. This piece of legislation was particularly important to Canada because of privacy issues expressed by the public (Bassan, 1996:15).

Bill C-104 dictated restrictions on the functions in which DNA samples could be invested, to arrest an accused or clear a suspect. Established within the bill, were the procedures officers had to follow in order to obtain a sample from a suspect. Based on previously established warrant provisions in the criminal code, police officers must adopt the same procedures and establish reasonable and probable cause for taking samples. The most important aspect in the consultation process for creating Bill C-104 was the determination of criminal offences that would warrant the taking of DNA samples. The DNA warrant legislation identified serious violent crimes involving personal injury to the victim(s) and storing physical evidence from the perpetrator. An important proposal

taken into consideration argued that certain minor offences can lead to larger violent ones. The introduction of this argument resulted in the list of crimes under the proposal (s. 478.04 of the Criminal Code) being broadened sufficiently to include offences that have the potential of causing injury (Bassan, 1996:16-17).

The warrant legislation amended the Criminal Code and the Young Offenders Act to allow judges to issue warrants for designated offences to peace officers (or others acting under the direction of a peace officer) to take samples in the name of the investigation, under the Criminal Code. Changes to the Young Offenders Act included considering young offenders to be adults, apart from the right to have counsel or other appropriate adults present at the time of bodily substance extraction. Depending on the crime committed by the young offender, the law that sealed all juvenile records at the age of eighteen was not to apply to DNA samples. A juvenile conviction for a serious violent offence means that the DNA sample will remain in the databank after the age of 18 for public protection (Solicitor General Canada, 1996:3).

The legislative process in Canada also created Bill C-3 as the second phase of the *DNA Identification Act*. The DNA databank scheduled to begin in June 2000 will include two sections; a) DNA profiles (evidence) taken from crime scenes and b) DNA profiles taken from offenders convicted of specified crimes. Only convicted offenders under primary designated offences will be placed in the databank. DNA analysis taken under for crimes that are not on the designated list will not be placed on the database. The discretionary power is left to a judge who can order an individual to give a sample to be placed in the

databank. This request can only be implemented if courts feel it is in the best interest of the administration of justice. Secondary offences are those in which bodily samples may be found on the crime scene; for example hijacking, robbery, and hostage taking (Solicitor General Canada, 1998:5-6B).

The samples taken from convicted offenders for primary or secondary offences will be retained and stored. This will allow Canada's DNA database to keep up to date with changing technology. Hence, with the rapid advance in forensic science, the samples may need to be re-examined in a few years (Solicitor General Canada, 1998:6-7B).

The Privacy Issues

Gene mapping has changed the way the administration of justice process functions. Although I have mentioned many of the benefits in DNA technology/data banking and given examples of cases that have freed or cleared wrongly accused individuals, there are still widespread fears that the technology can be abused. The invasions of privacy and civil liberty infringement are probably the most important concerns about the creation and maintenance of DNA databases.

In Canada the issues raised about the retention of DNA samples for future testing are similar to those raised in the United States. American civil libertarians argued that samples should be destroyed after an analysis is complete. They eventually lost this battle and it has been five years since the FBI developed CODIS (1995), its DNA database that retains samples for further testing (Wade, 1998:66). No sooner had

American civil liberty activists lost one battle, they were on the front lines again because certain states wanted changes to the DNA legislation, that would permit the seizure of DNA upon arrest. Though DNA issues raised in Canada and the United States may not reflect it, privacy and civil rights are intended to protect every citizen (ACLU, 1999:1)

DNA: Privacy and Civil Rights

The information contained in a persons DNA is valuable. The state must implement preventive strategies to restrict the possibility of abusing the knowledge that can be attained from the databases. DNA can be used for so much more than identification-it can map our physical and emotional characteristics. Moreover, genetic information pertains not only to the sample donor but also to everyone who shares his or her physiological make-up. With the tiniest sample, scientists can to some extent map a human's medical future (ACLU, 1999:1)

There are more than four thousand genetic diseases that can be identified by DNA analysis. This technology brings enormous promise with significant potential human benefits. At every level however, DNA information can also be a tool used for questionable and immoral behavior.

The wealth of information that can be extracted, the longevity of a sample and the creation of shared and cross-country accessibility is infringing on privacy, equality and due process. Even imagining such information in the hands of a future employer,

insurance company or even a potential spouse, is chilling. The implementation of DNA databanks is a double-edged sword (ACLU, 1999:1-2).

The issues surrounding DNA are not only medical, they are also behavioral. For years, scientists have tried to connect social problems with genetic defects. Grave dangers lurk in studies trying to determine if there are genes or genetic patterns for crime, suicide, violence, alcoholism or homosexuality. Although we may not want to believe that it could be possible, such data could be generalized to the whole population, even though it is taken from very few constituents of society?

To better understand why privacy rights are an issue we can turn to the American Department of Defense (DOD). Since 1992, the DOD has collected millions of samples from members of the armed forces. The reason provided for this practice is that it helps in the identification process of remains in the case of a death. It is important to note that all military personnel must give samples, not just those on combat duty. The fact that the DOD's "DNA Registry" collects samples from all enlistees indicates that the government's intentions are more far-reaching (ACLU, 1999:3).

The DOD initially confirmed the destruction of DNA samples upon an officer's discharge. With so many more scientific possibilities and benefits arising from DNA, the DOD has revised its practice and initiated a holding period of 50 years for all samples taken. The mandatory regulation to give samples and the DOD's refusal to implement regulations, which would ensure no third party access to the latter, also display ulterior

motives. For example, scientists working on projects dealing with human genetics could petition the government for access to DNA database information. This will make the unsuspecting donor part of a project to which they did not consent to. The rate of military personnel giving samples consists of several thousand each day. The military data bank has a maximum capacity of 18 million. This means that, once the bank is full DOD will have DNA samples for 7% of the American population on its database (ACLU, 1999:3).

The United States has had a working DNA database for five years. It started off with very specific government guidelines about who and when samples would be collected. In a short period of time, the scope was legally widened to include collecting samples derived from sex offenders, to all persons convicted of a crime and then to juvenile offenders (in 29 states). The United States is currently weighing the option of collecting DNA from all persons arrested (ACLU, 1999:3).

Major political figures are pushing the envelope on proposals for using this technology. Mayor Giuliani of New York City recently favored the strategy of performing DNA analysis for all newborns. The proposal was not formalized, but Giuliani feels that the samples should be collected as a tool to fight future crimes, trace deadbeat dads and resolve paternity suits. Another example of extremism comes from Michigan's Commission on Genetic Privacy, which has proposed that the State permanently preserve blood samples of newborns, which would be collected to determine congenital diseases.

Such action would put a remarkable amount of information about ordinary citizens at the State's disposal (ACLU, 1999:3-4).

The Canadian Department of Justice has specifically stipulated who will be placed on the DNA data bank and for what crimes. If civil libertarians in Canada are worried about loss of privacy they only need to look at the USA to see how aggressive this technology can be, and how fast laws are changing to accommodate it. In the United States, a survey showed that 50% of felony assault cases were dismissed outright and an additional 14% were reduced to misdemeanors. This 64% indicates that police do not always apprehend the correct perpetrator or have solidly grounded evidence to convict some offenders (ACLU, 1999:16). To make an assumption that everyone the police charge, when a crime is committed, is either a criminal or a future criminal is preposterous. The U.K. proposal to mass bank all citizens would be an infringement of civil rights.

Another issue that raises concern about the use of DNA in the criminal justice system is the way in which justice is achieved. Canada, the United States and Britain should be weary of any quick fixes to crime. DNA evidence offers an easy solution to pain staking hours of interviewing suspects and witnesses, studying evidence and building a case from nothing. DNA technology has proven to be useful in helping to convict notorious killers like Paul Bernardo and Larry Fisher. 'Cold Case Squads' are emerging in every police department, reopening old cases and submit evidence for DNA testing. In many of the cold cases, police investigations produced potential suspects but did not have enough

conclusive evidence to convict. Today 'cold squad' cases are simply reexamining evidence and carrying out DNA tests.

It must also be mentioned that good investigative work caught the worst killers of the century. Ted Bundy, The Boston Strangler, The 44 Caliber Killer (Son of Sam), John Wayne Gacy and several others were caught without the Use of DNA technology. Prior to forensic scientists who could perform DNA testing on evidence. time, energy and an abundance of manpower hours were put into solving a crime. It was about good police work, following tips and instinct, wherever the trail led. With advancements in technology, police work has experienced a shift. I will discuss the disappointing moral turns that law enforcement officials have taken in chapter four. Hence, I will continue to focus here, on how DNA will develop in criminal investigation.

DNA and Criminal Investigations

DNA technology is by no means a bad crime-fighting tool. However, people may be worried about the potential for misguided use and the dependence mechanism developing within the criminal justice system. In serious criminal cases, the police and law enforcement agencies have a job to do. DNA evidence cannot help solve every crime and equal effort should be put into each case. The issue of protection and justice in criminal cases should not depend solely on DNA but if this were to happen, serious cases that lacked DNA evidence may not be prosecuted. Police and prosecutors successes are measured by convictions. Many have argued that the practice of pleading down to lesser charges (especially on serious or multiple offences) is a slap in the face for the victim.

The lack of justice for victims is constantly observed in cases where minimal sentences for serious offences are advised. What would be the victim's perspective if the crown would not even lay charges unless DNA is part of the evidence?

A recent case in Toronto presents a glimpse of future law enforcement if DNA is the only evidence in a case. In August of 1999 to January of 2000 a series of sexual assaults occurred in Ontario, and police spent months sorting out tips, going over evidence, hiding in bushes and re-interviewing victims and witnesses. Saddled with a tainted work history two of the major police forces in Ontario knew that everyone was watching their conduct carefully. Just three years earlier, the police were faced with a similar string of sexual assaults. The notorious case is that of serial rapist and murderer Paul Bernardo (Blatchford, 1999:1).

Bernardo who committed several rapes before he graduated to murder was interviewed by police in connection with the crimes but overlooked as a possible suspect. The Metro Toronto and Niagara Regional Police forces were both working at solving the Bernardo crimes independently. At the conclusion of the Bernardo investigation, the public felt that if cooperation and information sharing were present, three young women would still be alive. Past mistakes tarnished the reputation of good law enforcement officers and on this new string of rapes they were working hard and looking for vindication (Blatchford, 1999:1).

The Bedroom Rapist believed to be responsible for eight sexual attacks, was on the prowl and police did not know where he would strike next. To catch the serial rapist, police did everything from organizing themselves, to carrying out public information and safety campaigns. This case is considered a shining example of police work: cooperation, information sharing, and put aside no egos. The strategies implemented leading to the arrest of the suspect will be incorporated into a guide for investigation policy and practice (Blatchford, 1999:2-3).

The arrest and conviction of Dr. Nicholas based on DNA evidence does raise some difficult questions however. It was believed that Nicholas attacked eight women but he was charged only with two sexual assaults. In the name of justice this could not make sense. It could make sense however, if we examine the evidence. The police had only two victims/crime scenes where bodily fluid was found. The prosecution did not charge Nicholas with eight counts of sexual assault, intent on showing the jury the similarities or patterns in the assaults. Instead, prosecutors jumped straight to the cases that could give them a certain conviction. As you will see in chapter four, winning convictions can sometimes be the essence for prosecutors. In the case of Nicholas, prosecutors and police overlooked the victims of the other six sexual assaults. Knowing that the offender is behind bars ensures public comfort. However, for the six victims there may not be a sense of justice for the violation they experienced.

Citizens are concerned that the government will eventually want to expand the uses of DNA samples beyond the purpose for which they are originally collected. Indeed, ordinary citizens now use many of the technological surveillance tools, audio equipment and hidden cameras which were once developed for bugging and keeping surveillance on mob bosses, or protecting business areas from theft, to satisfy their own curiosity. The market for such technological devices is not simply restricted or used by law enforcement agencies. Ordinary citizens are making use of equipment, designed for high-tech crime control, to manage household issues.

As a former store detective I know that miniscule cameras are used to monitor employee theft that goes on in well-hidden places like stock rooms. In the home, they are hidden in clocks and stuffed animals, to monitor the babysitter when parents are out, or to monitor the children themselves when unsupervised. Medical testing devices also have a function in the homes of everyday families. Parents are consumers of drug testing kits that can be ordered and returned through the mail to verify if children are consuming drugs or alcohol. Parents frequently police their own homes. With advancements in surveillance equipment and medical technology knowing what is going on in one's home can be caught on recording devices or through mail-in drug tests.

Summary

The current trend of a "science-based" tool in a "human-based" criminal justice system has already begun in Canada. We will begin to see more cases being prosecuted only if there is DNA evidence to win the case. As we will see in chapter four, the prosecution

and police want to win cases and, with the help of DNA technology this is made possible. The question remains however, what will happen to the cases in which there is no DNA evidence.

The benefits of DNA in securing both convictions and exonerations have all become clear in Canada in the last five years. However what is not clearly stated are the costs for the future in terms of the fears for privacy, for medical treatments, and determining behavioral traits. As the technology becomes more sophisticated, there will be greater concerns for securing and protecting stored DNA information.

Chapter 4: DNA, Guilt and Innocence

Agents of the Institution of Justice

DNA technology brings something new to the criminal justice system, in that it is a tool that can absolutely identify perpetrators clearing the way, in theory, for them to be brought to justice. In performing this function, DNA technology may reveal more about flaws within the criminal justice system. As an objective element DNA may help to control subjective and non-rational considerations currently operating within the criminal justice system. However, there are no assurances that it can clean up the shortcomings in criminal justice.

This chapter will examine the different institutions and applications of justice that have been affected by the introduction of a science-based approach to managing and controlling crime. In this chapter I will examine the facts surrounding cases where DNA exculpatory evidence freed 28 wrongfully convicted men, explore the reasons why wrongful convictions may occur and examine how DNA technology may not always be used to its fullest potential.

By understanding the shortcomings of a “human-based” justice system, we will better understand the impact a “science-based” system can have on crime control and management. As I have already established, DNA technology is an efficient and accurate tool for criminal justice. Applying a scientific mechanism that has the capability of measuring accuracy in percentages will have a profound effect on the current human-based system that relies on procedural conduct for measures of precision. For

example research shows that DNA testing can identify and match a sample of body fluid found on a crime scene and from a suspect to 99.9 percent accuracy. DNA technology has aided in solving a number of "cold cases" in both the United States and Canada. Unsolved cases like that of Mrs. Mayo, a 31 year-old housewife and babysitter who was found sexually assaulted and dead inside her London Ontario home on August 6, 1964. Recently officers of the Toronto "Project Angel" and the Centre of Forensic Science (CFS) confirmed a match between stored evidence and samples taken from the suspect exhumed body to conclude that the suspect who died in 1996 of natural causes was indeed Mrs. Mayo's attacker (Beaubien, 2000:1). This type of testing will bring changes from "procedure" to "percentages", and will not only affect citizen perceptions of justice, but will directly impact on the actors and institutions within the criminal justice system.

The police, prosecutors and judges are only some of the professionals involved in criminal justice. There are many more professions that work to make the system function effectively and efficiently. However, analysis of the criminal justice system indicates that at every level there is the potential for behavioral or legal misconduct. For many years there has been an attempt to try and understand how and at exactly what level of the criminal proceedings misconduct can occur, what it can cause, and the effect that it will have on criminal justice (Forst, 1997:292). The media is the avenue that keeps citizens abreast of criminal activity in their community. However the over-sensationalization of infrequent criminal occurrence by the media can in fact have a negative impact and brings into question the administration of the criminal justice system. The beliefs that the criminal justice system can in fact manage and control crime must be examined in detail.

The recent management orientation of crime coupled with the remarkable capabilities of DNA technology could lead to the inference that the technology can aid in winning the war on crime. This in part explains why so much attention is being paid to DNA science within the criminal justice system.

In the effort to solve a crime, the criminal justice system must determine if the evidence provided weight to the guilt of a suspect. No psychologist, sociologist, police officer, prosecutor nor scientist has discovered what a criminal looks like. However, in some instances professionals within the criminal justice system can presume a suspect guilty. As a consequence of applying a risk management methodology, which in fact calls for certain characteristics of an individual for example poverty, race, and socio-economics to be considered relevant in deciding whether or not they may be guilty of a crime. For individuals who possess these elements within society may be deemed more susceptible to committing crime. These individuals may be particularly vulnerable to false accusation that can lead to wrongful prosecution and conviction.

“Overt racial prejudice has undeniably factored in the erroneous convictions of defendants from minority groups. Suspects with mental disabilities have been known to falsely confess to crimes in order to placate their interrogator; those same disabilities then preclude meaningful participation in their trial defense. Other defendants are the victims of guilt by association, falsely accused because of their prior criminal record or wrongly implicated by the actual perpetrator of crime. In several cases, the police appear to have knowingly targeted an innocent person simply because of their inability to find any valid suspect to arrest” (Amnesty International, 1998:7).

Unfortunately, no exact inventory of cases offers insight into how large or minute the incidence of wrongful convictions are. However, in a study of 28 wrongful convictions carried out by the U.S. Department of Justice Office, a glimpse into some of the existing

flaws within the criminal justice system are revealed. Also revealed are reasons why there is a need for DNA technology to be used to its fullest capacity. In addition to ensuring that DNA testing is reliable and accurate; there is the need to ensure the proficiency and creditability of forensic scientists so that they can present the highest caliber of testimony and withstand the highest levels of scrutiny (Reno, 1996:1).

More importantly, the issue confronting the legal community is that in some instances there is the potential for law enforcement agencies, prosecutors and forensic experts to move forward with criminal prosecutions-when it is in the best interest of the crown-even if available evidence has minimal accuracy to identify the suspect. The criminal justice system is faced with instances where suspects have been prosecuted because less powerful DNA techniques failed to exclude them from the crime scene, or suspects have been subjected to outright misconduct on the part of the prosecution's scientific experts (Alexandria, 1996:6). For example in the Guy Paul Morin case, the forensic expert witnesses overstated their findings based on red fibers found in the Morin car and on the victim Christine Jessop. In fact the fibers, considered strong and substantial evidence, came from a lab technician who frequently wore a red sweater in the lab and handled both sets of samples (King, 1998:8).

The criminal justice system is not infallible, and this study demonstrates that the search for truth is not always easy. Of the 28 cases, apart from one young man with diminished mental capacity who plead guilty, all the convicted men in this study endured a trial by jury and were sentenced to long terms of imprisonment--the men served on average 7

years in prison. In all cases the convictions were successfully challenged using DNA evidence. Two-thirds of the cases were based on hair analysis, which has a significant margin of error in traditional forensic techniques.¹ In all 28 cases the errors in the evidence and procedures that led to convictions were unmasked (Alexandria, 1996:5).

These 28 cases, tried in 14 States and the District of Columbia between 1980 to 1991, support the remarkable abilities of DNA technology while exposing flaws in the procedures and the administration of the criminal justice system. Sexual assault was the most frequent crime, six of the 28 cases were homicides and all victims were female (Alexandria, 1996:19). Each defendant obtained case evidence for DNA testing and consented to providing a sample for comparison. All of the convicted men were exonerated by DNA technology but the details of the cases are revealing.

The majority of the defendants were represented by public defenders and most appealed their convictions at least once. The appeals were based on trial error (ineffective assistance) or new evidence. In some cases victims went so far as to recant their defendant identification testimony. Of the 28 convicted men 15 were known to police because of prior arrest and were used in photo spreads (Alexandria, 1996:19). The similarities in these cases extend further to include similarities in the forms of evidence that helped to convict these men.

¹The U.S. Department of Justice used evidence established by Giannelli, Paul C., "The Admissibility of Laboratory Reports: the Reliability of Scientific Proof," 49 OHIO ST.L.J. 671 (1988).

All the cases except for the six homicides involved victim identification and many had eyewitnesses who either placed the defendant with the victim or near the crime scene. Many of the defendants presented alibi defenses corroborated by family and friends. Juries considered these alibis insufficient to counter the strength of the eyewitness testimony. The majority of the cases involved the introduction of non-DNA tested forensic evidence that only narrowed the field of possibilities to include the accused. The tests involved comparisons of non-victim specimens of blood, semen or hair found at the crime scene to that of the defendants. Testimony from prosecution experts was also used to explain the reliability and scientific strength of the non-DNA evidence. The use of fabricated or unreliable evidence, that today, with DNA technologies available, would be considered shoddy at best, suggests that there were shortcomings on the part of the state (Alexandria, 1996:20-21).

After the 28 convicted men were cleared by DNA exculpatory evidence the study shows that the majority of the wrongful convictions were due to witness or victim misidentification. Misidentification will be discussed in detail later in this chapter. There were also allegations of government malfeasance and misconduct. Eight of the cases (as reported by defense attorneys and reflected in some judges' opinions) allege government misconduct in the form of perjured testimony at trial, police and prosecutors keeping exculpatory evidence from the defense, and intentionally erroneous laboratory and expert testimony admitted at trial as evidence (Alexandria, 1996:20). For example: In one of the cases namely, the State of Virginia v. Honaker (1984) the accused was found guilty of seven counts of sexual assault, sodomy and rape, and was sentenced to

three life sentences plus 34 years. Defense attorneys alleged that the government kept exculpatory evidence from them, including information that two of the government's witnesses were secretly planning to enhance their testimony on the stand and the fact that the prosecution's investigators were aware of the fact that Honaker had a vasectomy and could not have left semen at the scene (Alexandria, 1996:20).

In another case the State of Illinois v. Cruz and Hernandez (1995) the accused was convicted and sentenced to death for kidnapping, rape and murder. The supervising officer in the sheriff's department admitted, during the third trial that he lied when he corroborated the testimony of his deputies in the earlier trials about Cruz's "dream visions" of murder (Alexandria, 1996:20).

In the State of New York v. Kotler (1983) the accused was found guilty of two counts of rape in the first degree, two counts of burglary in the first degree, one count of robbery in the first degree, and two counts of burglary in the second degree. The sentence was 25 to 50 years. The government serologist reportedly lied about his qualifications and withheld exculpatory evidence. There were police reports that stated that one of the victim's had not positively identified the defendant's picture but described him as a "look alike". The reports also showed that both of the victims' descriptions of the defendant were inaccurate for age, height and weight, a fact that was withheld from the defense (Alexandria, 1996:20).

In the State of West Virginia v. Woodall (1987) the accused was found guilty of first-degree sexual assault of one woman, first-degree sexual abuse of a second woman, kidnapping both women, and aggravated robbery of both women. The sentence was two life terms without parole and 203 to 335 years in prison. The court later concluded that expert serologist Fred Zains from West Virginia State Police office perjured his testimony. Zains overstated the strength of hair and blood analysis results, reporting inconclusive results as conclusive and repeatedly altered laboratory results. These transgressions went ignored or concealed by his supervisors even in the face of numerous complaints by defense attorneys and opposing expert witnesses (Alexandria, 1996:20). There are currently appeals pending in 130 of the cases in which Zains appeared as an expert witness.

In light of the unsubstantiated evidence and the alleged misconduct on the part of the state we can assume that DNA technology will bring a higher level of proof to the evidentiary aspect of the criminal justice system. The accuracy of DNA evidence will be an ally to the process of identifying the correct perpetrator. DNA technology may not however, adequately lessen the occurrence of misconduct on the part of the state.

In many of the 28 cases that DNA exculpatory evidence was entered as newly developed evidence, the convicted men were given pardons--because they had exhausted their appeals, or had exceeded the statute of limitations for entering new evidence pertaining to their cases--and freed after years behind bars for crimes they did not commit. In the majority of cases the prosecutor did not reenter a motion to appeal.

However in five cases, prosecutors contested the defendant's attempts to have evidence released for testing and even after the courts released the evidence and DNA tests conclusively excluded the already convicted men, protest continued from the prosecutor's office. The point is that to some members of the criminal justice system, DNA evidence may further bring into question the conduct and accuracy of criminal justice proceedings. Beyond the 28 cases discussed above, there are numerous examples of misconduct on the part of the criminal justice system regularly reported in the popular media. The answer as to how many people are wrongfully convicted remains unknown and may be unknowable.

There is no way to separate the legitimate claims of innocence or determine with accuracy the actual number of wrongful convictions, especially since there are guilty people in prison who insist they are innocent. In Canada very little research has been done in this area. However, in Britain a study for the National Association of Parole Officers was conducted at Long Lartin maximum-security prison and showed that as many as 6 percent of inmates may be wrongfully convicted. This study and the estimations drawn therefrom are considered typical of other British prisons. A British Royal Commission report states that 700 to 800 cases that may in fact be wrongful convictions are waiting for review. The report also stated that one-third of British Police Departments are being investigated for misconduct in connection with some of these cases (Anderson & Anderson, 1998:8-9).

Eyewitness and Jailhouse Informant Testimony

Ronald Huff, Director of the Criminal Justice Research Center and the School of Public Policy and Management at Ohio State University; Arye Rattner, Professor of Sociology at the University of Haifa, Israel and the late Edward Sagarin, Professor of Sociology at City College and City University of New York tried to estimate how many wrongfully convicted individuals sit in American prisons. They researched the topic for years and wrote a book called: *Convicted But Innocent: Wrongful Conviction and Public Policy* (1996).

Based on the study, Huff et al. estimate that 10,000 people in the United States may be wrongfully convicted of serious crimes each year. The study was based on a survey of 188 judges, prosecuting attorneys, public defenders, sheriffs and chiefs in Ohio and 41 state attorneys general. The survey showed that 72 percent of the respondents estimated that the prevalence of wrongful convictions in the U.S. is less than 1 percent—but greater than zero. Based on these findings Huff et al. estimates that 0.5 percent of the 1,993,880 convictions in the United States for index crimes in 1990 were of innocent people² (Huff et al., 1996:3-8). These results mean that an estimated 9,969 wrongful convictions occurred in 1990. Huff et al. believes that the number is a low estimation because the sample was “staked in favor of obtaining a conservative estimate” (Huff et al., 1996:8). Huff et al. go on to say that the reason for the conservative estimates were partly due to the fact that prosecutors and law enforcement officers have every reason to defend the system’s accuracy and underestimate error. Huff et al. also believes that conservatism is

² Index crimes, which are reported by the FBI, are murder and non-negligent manslaughter, forcible rape, aggravated assault, robbery, burglary, larceny theft, motor vehicle theft and arson.

due in part to a mere 9 percent of the respondents being public defenders therefore there is less of a critical view of the criminal justice system (Huff et al., 1996:10). Although the estimates for wrongful convictions may be underestimated the low estimates still have significance for the public and the criminal justice system.

Wrongful convictions undermine public confidence in the judicial system and should not be taken lightly. According to Huff et al. these figures indicate there should be serious concern for public safety since the actual perpetrators of crime remain free to victimize other citizens. An example is found in the case of Jackson Williams, a Columbus man, who spent five years in prison in the early 1980s for rape. Later it was determined that the crime had been committed by a physician who was similar in appearance and had the same last name. Apart from the three rapes that Dr. Williams committed, which led to Williams release, no one knows how many other crimes he committed while someone else sat in jail (Huff et al., 1996:15).

To determine why wrongful convictions occur, Huff et al. analyzed the court proceedings from 205 wrongful convictions based on evidence, testimony and misconduct on the part of the state. The analysis revealed that although wrongful convictions were the result of a combination of errors, the main cause, in more than half of the cases—52.3 percent—was due to eyewitness misidentification and as we will see later, can also be caused or encouraged by overzealous police and or prosecutors. Huff et al. found that the next most common cause was perjury, which constituted the reason for 11 percent of wrongful convictions. Perjury included negligence by criminal justice officials, coerced

confessions, “frame ups” by guilty parties, and general overzealousness by officers and prosecutors (Huff et al., 1996:19).

The Huff et al. study found that overzealousness could lead authorities to bend rules as a means to getting a suspect off the streets and resulting in two injustices: the first, convicting the wrong person and secondly and just as important is the fact that criminal justice officials leave the real offender on the streets free to victimize others (Huff et al., 1996:11).

The unethical conduct that is evident from these studies identifies the need for the accuracy offered by DNA evidence in identifying the correct offender. Misconduct or overzealousness on the part of authorities are serious issues and need to be addressed as a high priority. Although some wrongfully convicted individuals have been freed from prison we do not know how many more remain behind bars knowing they did not commit the crime for which they were convicted. Appropriate attention and adequate punishment must be attached to those who may knowingly let innocent people go to prison. In the event that past injustice is not corrected, using new available technologies where possible, the criminal justice system will be hard pressed to make a smooth transition from the current human-based system and increasing dependence to science-based technology.

At the heart of many wrongful convictions is the use of eyewitness and jailhouse testimony. Although we have some idea that the credibility of these types of testimony

can be weak to faulty, in many cases it is the only evidence available. No scenario is more frustrating to the public and law enforcement agents than a serious crime and no evidence. Eyewitness testimony evidence usually comes from ordinary citizens who are witnesses or victims of an offence.

Jailhouse informants usually offer second-hand testimony based on discussions with an accused or overheard confessions. In a court of law testimony that places a suspect at the scene of a crime, identification from a victim or direct testimony about confessions can have a profound effect on the jury (Anderson & Anderson, 1998:11).

In line with the risk management methodology, justice agencies expect a certain level of participation from citizens to solve crime. Agents of the state appeal to the public to be good citizens--as part of their civic duty--and report anything seen or heard in the commission of a crime. Police communicate through the media, hot lines or door-to-door visits. According to Philip Rosen (1992), citizen reporting is the most reliable way to get a conviction. However, a Globe and Mail article reported that after reviewing 1000 wrongful convictions in the United States approximately half were due to eyewitness error. The same report estimates that 80,000 trials a year in the United States rely on eyewitness evidence (Globe and Mail, 1995:D8). The criminal justice system has come to rely on the public to report crime and for those who are witnesses to provide testimonial evidence even though the method has proven not to be completely reliable (Anderson & Anderson, 1998:12).

Over the years, psychologists have found human memory to be inherently unreliable; which further brings into question the credibility of eyewitness evidence (Anderson & Anderson, 1998:13). In the Huff et al. study eyewitness testimony is found to be the cause of wrongful convictions in 52 percent of the wrongful conviction cases. Despite a strong reliance on eyewitness testimony, there is also a 50-50 chance of error (Wells & Bradfield, 1993:554). The result is that we may have a larger number of wrongfully convicted individuals than the conservative estimates discussed above. Even though there may be errors within some eyewitness testimonies, the final say on whether the testimony is credible is in the hands of the judge or jury.

Eyewitness testimony in a trial is strong evidence particularly to jurors and the impact of the testimony hinges on how believable the witness is--it boils down to credibility. A jury is faced with piecing together the truth from inconsistent and contradictory testimony and is unaware of the problems of reliability associated with eyewitness testimony (Anderson & Anderson, 1998). The jury is expected to make subjective calls and decide whom to believe and what inferences to draw from conflicting statements. For example, when a victim identifies the accused as her assailant but the description in the police report does not coincide with the defendant in court, juries must make a judgement call. Another scenario is when juries are confronted with having to choose between a victim's declaration of identification and a statement of innocence or alibi submitted by the accused (Armstrong & Possley, 1999:6-7B). The jury may ask themselves what these victims or witnesses have to gain? Their answer may be nothing, therefore, the testimony is considered credible.

Misidentification is not necessarily an intentional error. In fact witnesses may actually be looking but are not seeing what they believe they are. People in general have a misguided faith in the accuracy of their memory and it is this that can lead to misidentification. Psychologists believe the factual picture in a person's memory can be subjected to alteration depending on added stimuli, the duration of witnessing, the occurrence and lapse between the latter and the opportunity to see the accused or record the event (Sleek, 1999:2). All of these factors can have an effect on the memory of a face, characteristics, mannerisms and even occurrences.

The most pronounced factors that can effect memory and decrease the reliability of accounts come from stressful stimulation. In cases where a firearm is used in the commission of a crime, the victim and other potential witnesses often suffer from "weapons focus". Fear paralyzes the witness into focusing solely on the weapon and impairing attention to the perpetrator's details. Another inhibiting factor can be found in cross-racial identification. Identifying perpetrators of other races without frequent contact with members of that group can diminish the ability to remember and describe important features. Although memory recall can prove to be accurate when providing general information about what occurred, it is usually the details (height, scars, clothing, and accents) that victims consider inconsequential, that have the biggest impact in a criminal investigation's ability to correctly identify the perpetrator (APA, 1999:2). All of these factors can lead to misidentification and possibly wrongful conviction even though the victim or witnesses feel they have positively identified the suspect.

In one of the 28 cases that established innocence with DNA exculpatory evidence, the victim positively identified her assailant from a photo and a physical line up. On August 1, 1984 Ronald Cotton was arrested for sexually assaulting, and burglarizing two women. In the State of North Carolina v. Cotton, a jury--in January 1985--convicted Cotton of one count of rape and one count of burglary. In an appeal of his conviction, in November 1987, Cotton was convicted of both rapes and two counts of burglary. The Alamance County Superior Court sentenced Cotton to life plus 54 years in prison (Frontline, 1997:1A).

With the possibility of such a serious sentence one would assume that the prosecutor's evidence was airtight. In fact, this was not the case. The prosecutor's evidence presented at trial failed to include the fact that the second victim did not pick Cotton out of either a photo array or a police lineup. Although the jury did not hear about the second victim's inability to positively identify her assailant, they were privy to Cotton's alibi supported by family members. A flashlight found at Cotton's house resembled the one used by the perpetrator and rubber found on the crime scene was consistent with rubber from Cotton's tennis shoes. The jury weighed the evidence in favor of the eyewitness testimony and found Cotton guilty (Frontline, 1997:1A).

At Cotton's second trial the victim who could not initially identify him decided that Cotton was indeed her assailant. Around the time the second trial started, a man in prison, who had been convicted for crimes similar to those Cotton allegedly committed, confessed to the crimes for which Cotton was on trial. The superior court judge refused

to allow the information into evidence and Cotton was convicted of two rapes and burglaries. After exhausting all of his appeals in 1994 new lawyers filed a motion for DNA testing. In 1995 the test exonerated Cotton and after spending 10 ½ years in prison Cotton was free (Frontline, 1997:2-3A).

The most significant aspect of the Cotton case apart for the realization that the wrong man was convicted is the fact that no one saw the errors in the case or attempted to look for any other possible suspect. However, contributing to the notion that DNA databases offer society a truth in the identification of perpetrators the Cotton case and DNA evidence/databases led to the apprehension of the real perpetrator. The case also reiterates that there are serious problems with eyewitness or victim identification. The victims who identified Cotton still to this day claim that when they see their rapist they see Cotton. Even though these memories may have been caused by influential factors to the victims or witnesses they are real. This is partly due to the fact that the victim or witness feels empowered by being able to aid in the apprehension of the suspect and put a face and name to the perpetrator (Frontline, 1997:2-3A).

Prompts can be another of the many factors that influence misidentification. Positive or negative verbal communications to a witness, through gestures or any form of body language from can influence the accuracy of accounts. Psychologist Gary L. Wells Ph.D. and Ph.D. candidate Amy L. Bradfield conducted a study on eyewitness testimony, utilizing positive and negative prompts during and after the identification of a suspect in simulations. The participants were given cued prompts after viewing a video of a crime

where the perpetrator could barely be recognized. The study showed that those who received positive feedback after their identification were highly confident. Some even fabricated facts not shown on the video, so confident of their identifications they were willing to testify in a court of law (Wells & Bradfield, 1993:553).

The groups who received the negative or no prompts at all were reluctant to identify a perpetrator and testify in court (Wells & Bradfield, 1993:553). Prompts can have a significant impact on how the witness or victim reacts to seeing the perpetrator or someone who resembles them. Simple body language can point out the person that should be picked. Everyone works on rewards systems and if positive feedback given during the process of identification, the witness may consider that they are 'on the right track' to doing something good and as such, may believe they saw that which they did not.

Time is another factor that can have an impact on the accuracy of identification. The time elapsed between seeing the suspect to making a positive identification is crucial to accuracy. It is best to make the identification as soon as possible. However, witnesses or victims are frequently called in to identify a suspect days after their initial sighting. At the time of the identification, they are frequently under the assumption that the suspect is in the line-up or among those in the photo array. Uncertainty about the appearance of the perpetrator but the belief that the police have apprehended the accused causes the witness to begin eliminating possibilities if they do not remember the suspect's characteristics or do not recognize him in the line up or photo array. By eliminating candidates the witness

begins a process of looking for the closest match and replacing the actual suspect with someone who looks similar in appearance (APA, 1999:1). Understandably, there is a strain on victims and witnesses as they work to assist the law in the apprehension of perpetrators who may also have victimized them.

The unintentional mistakes that eyewitnesses or victims sometimes make in identifying a perpetrator is significantly different from the type of evidence that comes from jailhouse informants. False testimony from a jailhouse informant is called “false witness for the prosecution” and the consequence is that the informant can be charged with perjury. Perjury is a criminal offence that occurs when a witness knowingly lies about their testimony. Unlike eyewitness testimony, jailhouse informant testimony is problematic because in certain circumstances, these witnesses can be considered unreliable in that, they may derive personal gain (e.g. reduced sentence) for their testimony.

As an expert on jailhouse informants and accused witnesses, Martin Weinberg (1996) believes that the potential for personal gain may promote unreliable or false testimony. An important fact about these types of witnesses is that the jury may not always be informed that the individual testifying to confessions or overhearing conversations has received gains for the testimony being given. The creditability of jailhouse informants or accused witnesses may diminish if the jury was made aware of their past convictions or motives for testifying (Rohrlich & Berry, 1998:1). The use of jailhouse informants has been used for years by the criminal justice system both in Canada and the United States.

A good example of how using jailhouse informants can hurt an innocent man is found in the Regina vs. Guy-Paul Morin case. The government inquiry into Morin's wrongful conviction began by revealing that both jailhouse informants who testified against Morin, had lengthy criminal histories. The two informants, Mr. Robert Dean May had 11 prior convictions and Mr. X had a juvenile and adult record for multiple offences including child sexual abuse. Both witnesses underwent forensic psychiatric assessments at various times while in custody for anti-social behavior, and were both admitted liars. Mr. May testified that Morin confessed to killing Christine Jessop and Mr. X corroborated the story with testimony about having overheard the confession (King, 1998:7). These two pieces of testimony were damning to the Morin case and helped put him in jail for a crime he did not commit.

The erroneous testimony of eyewitnesses, victims, jailhouse informants and accused witnesses can sometimes cause an innocent person to spend years of their lives behind bars. Whether intentional or not, at issue is how the criminal justice system can reduce the occurrence of these injustices. In fact, this is another area where DNA technology can aid the criminal justice system and the public in correctly identifying a perpetrator. Not every case will have DNA evidence so it is necessary to be aware of the shortcomings of eyewitness testimony as we try to make the criminal justice process more fair and efficient.

To examine how misconduct on the part of police, prosecutors and judges may go unnoticed and unpunished I will examine a Canadian case that occurred before DNA

technology was introduced into the criminal justice system. The Donald Marshall case illustrates some of the actions by agents that can lead to wrongfully convicting an innocent person. Donald Marshall was convicted of killing his best friend Sandy Seale on May 28, 1971. The miscarriage of justice began with overzealousness on the part of two police officers, who knew Marshall had a criminal record and more aware of his reputation as a troublemaker. In a small town, murder was a big case. Unfortunately, the local law enforcement agency lacked the necessary experience to carry out a thorough investigation. The police found a suspect and presumed him to be guilty when he lied about being at the park where Seale was stabbed. With the presumption of guilt the police proceeded to build a case against Marshall (Anderson & Anderson, 1998:28).

According to a study of the Donald Marshall case by Anderson and Anderson, during the interrogation process the police reportedly threatened and coerced the three star witnesses into testifying that they saw Marshall stab Sandy Seale. At trial, the prosecution accepted the case presented by the police and never investigated the possibility of any other suspect. They never considered the possibility that another man who was in police custody for questioning about the same murder could also be a suspect (Anderson & Anderson, 1998:28).

Marshall's defense council was also inadequate. His lawyer, a recent graduate with a heavy workload and little experience in murder cases, was given the Marshall case and was ill prepared. At the trial, Marshall's defense council did not realize that the coroner testified that the killer of Sandy Seale was right-handed, while in fact, Marshall was

left-handed. All of these factors led to a conviction and a twenty-five year sentence for Marshall. After spending twelve years in prison, Marshall was finally vindicated and released from prison. However the police, prosecutor and defense council were never reprimanded or even called to answer for their behavior. The two officers, whose overzealous and questionable actions helped to convict Marshall, both received promotions not long after the case. New officers brought the real killer to justice. It turns out that Seale's killer was Roy Ebsury a man questioned by police and released. Ebsury was sentenced to only 1 year in jail for aggravated assault, claiming self-defense (Anderson & Anderson, 1998:28-34).

The Marshall case shows the strength of eyewitness testimony over innocence and the misconduct that can occur in the criminal justice system. Donald Marshall was exposed to the tunnel vision mentality that can sometimes be found in the criminal justice system. Individuals can be stereotyped because of race, past convictions, class and so forth. Marshall was a Native, poor, a liar, and an ex-con. Marshall was exposed to unethical and unprofessional behavior on behalf of the criminal justice system. Such cases not only rob people of their lives but they can diminish the public's confidence in the system. This case and others like it give insight into how wrongful convictions may occur at the hands of the justice system. (McNamara, 1999:2)

The Criminal Justice System

The significant impact and benefits that “science-based” tools like DNA testing can have on the application and administration of criminal justice has been demonstrated. DNA technology brings a level of proof to the criminal justice system that, on occasion, it has been unable to attain because of evidentiary shortcomings. Also, the cases discussed raised the possibility of misconduct on the part of criminal justice agents and agencies. Although there is no clear statistical data, and estimates on prosecutorial, police and defense misconduct are low, the issue must still be addressed. Information taken from research conducted by Ronald Huff et al. and the British Royal Commission, as well as the media’s sensationalization of occurrences of misconduct makes us aware that this type of behavior does occur in our system even if it is infrequent.

The state’s desire to manage and control crime efficiently and effectively means that the state has a duty to examine and adequately deal with any and all shortcomings that may compromise the move from a “human-based” to a “science-based” system. In as much as the system applies management and assessment tools to identify and control crime risks, it must do more to prevent and safeguard for a miscarriage of justice within the criminal justice system. Efficiency in all sectors of the criminal justice system may result in a higher level of crime control and management.

With the introduction of DNA technology into the criminal justice system there is a way to accomplish a higher level certainty when identifying perpetrators. Any percentage of misconduct by agents or agencies of the criminal justice system goes unacknowledged,

jeopardizes the validity of DNA technology and may in fact hinder its potential for use may not be used to its fullest potential. In the worst case scenario, this technology may even be manipulated to enhance the appearance of efficiency when in fact, no positive changes are being made. Such a reality would not serve the best interest of the public. I believe it is better to acknowledge past mistakes and try to rectify them instead of ignoring them and having a tainted appearance of infallibility.

Acknowledging the rare occurrences of misconduct on the part of criminal justice agents and agencies is important in order to understand how detrimental any percentage of misconduct can be to the public, innocent people and the integrity of the justice system. More importantly, if these behaviors go unnoticed and unpunished they can only underline the inefficiency of the system.

The four cases that follow—although not the norm in criminal justice—may give us some insight into why the issue of acknowledging past mistakes will benefit the public, the administration of criminal justice and the use of DNA technology. It has been stipulated that the goal for implementing DNA technology is to achieve a higher level of efficiency by convicting the guilty and freeing the innocent. These four cases, though the extreme, indicate the possibility that the criminal justice system may be trying to limit the use, or credibility of DNA technology in wrongful conviction cases. Such actions may inhibit the use of DNA technology for innocent people in prison. If DNA testing is not allowed because of exhausted appeals, or not considered strong enough to prove innocence then it

will eventually only serve one purpose in criminal justice and that is to convict or eliminate suspects forgetting about those before this technology .

Criminal justice is best described as a search for truth; but it is difficult to reach the truth if there is no acknowledgment and rectification for past errors. The state and the criminal justice system's agents and agencies are not above questioning. More importantly, there is no such thing as infallibility where crime and justice are concerned. Despite regimented procedures, mistakes are sometimes inevitable. The purposes behind implementing DNA technology are to decrease the possibility of misidentifying suspects, and to increase the possibility of convicting perpetrators. An aura of infallibility may in fact damage or limit the use of DNA technology. By neglecting past mistakes, the state is undermining the validity of this "science based" technological tool and subjecting it to the same "human based" errors that it is there to replace (Frontline-Gershman, 2000:1).

DNA evidence can help rectify past mistakes and clear innocent people. However, a convicted individual who believes justice was not served and challenges the procedural conduct of a trial quickly realizes that such a process is long and difficult. Wrongly convicted individuals have to promptly prove that a constitutional violation occurred during trial; and such proof is by no means a guarantee for a ticket out of prison. The system demands that the suspect must in fact prove his innocence beyond a reasonable doubt.

With the time limits to make a violation claim and provide proof of a specific constitutional infraction, the strongest of technical vices may not result in a new trial or a solid basis to get out of jail. People have had new witnesses, recanted incriminating statements, new investigations with new evidence; and still, the criminal justice system was not eager to reopen the original proceedings. In America, even severe constitutional violations do not generate new trials (Frontline-Liebman, 2000:4).

Every aspect of the criminal justice system has procedures, which as I have already stated are not beyond reproach. The prosecutors are at the heart of the criminal justice system and procedural processes largely reflect on their ability to prosecute an individual for a crime. If a case turns out to be a wrongful conviction, on occasion the prosecutor will suggest that there was a mistake. Acknowledging a mistake may suggest that the entire office acted incorrectly or unprofessionally. The prosecutor cannot say or do anything that undermines the public's confidence. Prosecutors may know that innocent people are convicted. Yet, when years are invested in working with the police, witnesses and more importantly the victims and their families; and after telling a jury that someone is a horrible killer, prosecutors simply cannot alter their judgments and confess that they could be mistaken. Appearing weak or soft on crime diminishes the perception of criminal justice (Frontline-Gershman, 2000:2). Prosecutors and police see the victim as the underdogs of society, and this does not implicitly mean that they would surrender to mistakes and reveal flaws that can be taken advantage of by criminals.

The scarcity of flexibility to concede judicial mistakes and an aura of infallibility represent the criminal justice system as a well-calibrated machine that serves and protects the public. If this is true, one would think state agents and agencies would support administrative reform to implement and support DNA technology in criminal cases, to draw an equilibrium (a meeting of the minds) between the “human based” and “science based” systems in criminal justice. As it stands, DNA fingerprinting can conclusively identify a suspect, if bodily products are collected from a crime scene. If criminal justice officials believe that proper procedural conduct in the eyes of the court dictates guilt conclusively, then the prosecution has a perfect tool in DNA because its ability to conclusively identify perpetrators is known. Such a revelation would lead the state to have the perfect technology for convicting offenders and at the same time rectifying past mistakes.

In opposition to what is publicized by positive DNA media coverage about the acceptance and confidence in DNA by criminal justice officials, a negative attitude can be detected in a critical part of criminal justice, namely prosecutors. Before DNA technology existed it was almost impossible to prove innocence after conviction through procedural misconduct. DNA offers a challenge to old cases and old evidence. However, if prosecutors do not fully support DNA as the most efficient and effective tool, they can deny that past convictions were wrongful based on proper conduct of procedures.

We can see how this unbiased, reliable, and accurate science-based crime-fighting tool stands to improve the system and create hope for dealing with violent crimes in society. Nevertheless, the acceptance of DNA technology in the criminal justice system as a completely reliable tool can replace many of the answers prosecutors raise, as mere speculation on who committed a crime. The lack of outright support by the prosecution is based on the fact that DNA technology cannot answer questions and investigate motives. Hence, it is a good support to prove guilt but not to exclude someone thought to be guilty. Prosecutors claim that gene mapping is not conclusive; other forms of evidence like eyewitness testimony, confessions or circumstantial evidence are, according to their rationale, core elements to criminal proceedings (Frontline-Gershman, 2000:3).

An increased reliance on DNA evidence will raise two major issues for the criminal justice system. DNA technology will never be totally acceptable by all criminal justice officials because 1) it would result in owning up to mistakes and 2) having to free prisoners in controversial cases. Many of the distortions within the system about DNA's accuracy are relegated to high profile death penalty cases for murder or rape (serious offences). By acknowledging judicial mistakes and re-testing evidence, the fear is that many death penalty cases will have to be reopened. The state would have no choice but to release those wrongly convicted individuals. More importantly, a release may identify the state as incompetent to safeguard society, since it has managed to leave serious violent offenders to roam freely. The fears hover around the presumption that more criminal justice errors have occurred than expected (Frontline-Gershman, 2000:4).

The State's readiness to implement DNA technology that will be used to convict or clear individuals in criminal justice and the lack of any political constitution for prisoners, made it easy for Congress to pass the "Anti-terrorism and Effective Death Penalty Act" in 1996. This American legislation reinforced the control the state has over society and more importantly, over those formally subject to surveillance by way of incarceration. The legislative terminology appears to identify two specific groups. However, "what the act does, is that it withdraws procedures after you've been convicted, for deciding the legality, the accuracy and the reliability of those convictions" (Frontline-Leibman, 2000:3).

Similarly, the state of Virginia passed the "21-day-rule" which only gives convicted individuals 21 days to re-file and have their cases reviewed. The new legislation was designed for serious offenders, however, the persons most hurt by this legislation are not death row inmates or terrorists but individuals in prison for street crimes or wrongly convicted individuals. The results of the new legislation--in light of DNA evidence exonerating wrongly convicted individuals—is that states that felt strongly about the death penalty are now able to deny release for inmates even if DNA technology indicated they were non-participants in the crime for which they are convicted (Frontline-Leibman, 2000:3-4).

If DNA fingerprinting was considered conclusive within the criminal justice system, wrongly convicted people would be released from prison, including death row inmates. In order to get public support on DNA and data banks, the state has described gene

mapping as the 99.9% accurate identifier of humans. Within state crime agencies, the advocacy for DNA forensics is weak because there is too much at stake. Therefore, the possibility of limiting the use of DNA technology may have been written into law.

In the 28 cases discussed above I have attempted to show that DNA technology is working to exonerate wrongly convicted individuals. In light of legislative changes (disallowing DNA testing on old cases) and the lack of attention to the potentially minute but important occurrences of misconduct on the part of agents and agencies of criminal justice this may be changing. Limitations are being placed on the access and reliability of DNA technology to free wrongly convicted individuals. To support my argument that there is the potential to limit the use or manipulate the effects of this “science-based” tool in a “human-based” system I offer four American cases of wrongful conviction. These four cases--although not the norm in criminal justice--will portray a clearer picture of the states’ fear to acknowledge past mistakes and the effect DNA can have on wrongful convictions therefore the system.

The four cases being discussed deal with DNA technology, the focal point being innocence. What is evident after reading the histories of these men is just how far the state might have to go to maintain an aura of infallibility. We will also witness that DNA evidence appears only to be useful in criminal justice when it can be used as evidence to prosecute an individual. The legal boundaries, loopholes and legislative changes are also discussed to see what the state has done to protect itself from having to admit judicial mistakes.

Earl Washington Jr., Clyde Charles, Roy Criner and Roger O'Dell are not as famous in Canada as Milguard or Morin nonetheless; they all have suffered similar fates.

Clyde Charles a black man was charged and convicted of aggravated rape of a white nurse in Houma, Louisiana in 1981. Louisiana law stipulates a mandatory life sentence; and with an all white jury a 27 year-old Mr. Charles remained in prison for nineteen years. The case was built on eyewitness testimony—the accused was brought to the hospital and put in front of the victim for identification. Charles never stopped claiming his innocence. In 1990, he began petitioning the state to reopen and test the evidence using DNA technology. The requests were blocked, ignored and disregarded by the state and federal officials. Fortunately, Charles' case landed on the desk of Barry Scheck and the innocence project was launched. With Frontline media attention and a strong legal team in May 1999, the state of Louisiana agreed to do the test on two conditions. Mr. Charles was not able to sue the state for wrongful conviction or for previously refusing to do the testing (Frontline, 2000:1B). In December 1999, Charles was released from prison; he was 46 years old.

Barry Scheck believed Charles would still be in prison if it were not for the publicity his case received. This case is a clear-cut wrongful conviction, however prosecutors and the state still stand by the procedures of the case (Frontline-Scheck, 2000:1).

The second case is probably the most known of the four because it resulted in an execution. Joseph Roger O'Dell was arrested and convicted for the murder, rape and

sodomy of Helen Shartner in Virginia (1986). The case which was based on blood evidence (which we know cannot conclusively identify individuals, but only group them into a category) and a jail house informant. O'Dell appealed to the court for a new trial. Supreme Court Justice Harry Blackman seriously questioned O'Dell's guilt and the Roman Catholic Diocese of Richmond Virginia petitioned the circuit court of Virginia Beach to release the evidence for testing. Every request for DNA testing went unheard and the Supreme Court eventually rejected his last appeal (Frontline, 2000:1B).

Unfortunately, in 1997 O'Dell was put to death. Currently, another petition is presented in front of the court, requesting a release of the evidence from the O'Dell case for DNA testing. The prosecutors and criminal justice system are strongly against the release of the evidence. They claim that O'Dell, not only received a fair trial, but that his guilt does not need a DNA test to be proven (Frontline, 2000:2B).

These two cases show just how damning DNA evidence can be to the State's reputation. Indeed, perhaps the state already knew that it convicted the wrong person. Nonetheless, he remained in jail for a crime he did not commit and in fact had to gamble on the right to compensation, for the truth to be released, outside the jail's boundaries. In Mr. Charles' case, the state's choice to allow the testing was inevitable because of media attention. For O'Dell it will not be easy; the state will continue to keep DNA testing away from the evidence as long as it can. The state will not open itself up to the repercussions of putting an innocent man to death. The claim that procedural conduct leads to the right outcome,

is definitely not true in the Charles' verdict; nineteen years later, he has not even received an apology. For Mr. O'Dell we may never know the truth (Frontline, 2000:4B).

The evidence used in these two trials was shoddy at best. The sole idea that blood evidence was used to convict O'Dell although the technology could not conclusively identify him, inevitably sets the grounds for DNA testing. As you read earlier in this chapter, the other sources of evidence used to convict these two men are also unreliable (Frontline, 2000:2B).

Earl Washington Jr., a black man in his early twenties with an I.Q. of 69 was convicted and sentenced to death in Virginia (1984) for the murder of a white 19 year old named Rebecca Williams. For the prosecution, this was an open then shut case because Mr. Washington confessed. Washington's attorney insisted that the confession was inconsistent and coerced, based on his low I.Q. and his "easily led" personality. Nine years later, Washington had reached the end of his appeals. The last hope was an appeal for clemency from Governor L. Douglas Wilder (Frontline, 2000:6B).

Before Wilder would consider a decision, he wished for a DNA test to be undertaken. The first test excluded Washington as a suspect. The prosecution quickly drew a new theory: Washington had an accomplice; and the reason why no DNA evidence was found, was due to an incomplete sexual assault. The whole theory however, went against the dying declaration of the victim, which stated there was only one assailant (Frontline, 2000:7B).

In 1993, Wilder's term as governor was coming to an end and Washington's execution date was closing in. In secret, the governor ordered a second DNA test on a blanket never tested before. Without letting Washington's lawyer know about the test or results, Wilder put an offer on the table. Lawyers had two hours to accept a clemency offer, life in prison instead of the execution. Washington's lawyer took the offer. In a Frontline interview, Wilder denied the test was a secret and a copy retrieved by the reporter revealed that Washington was eliminated as a possible donor. In February 1999, the Virginia General Assembly rejected legislation that would have made possible a new trial for Washington by the "21- day rule" for hearing new evidence after final sentencing (Frontline, 2000:7B).

The last case is that of Roy Criner who in May 1990 in the State of Texas received 99 years for the rape and murder of 16 year old Deanna Ogg. The prosecution portrayed Ogg as an angel, sweet country girl, who had her innocence stolen by Criner. The evidence that secured Criner's conviction was based on statements he made to friends and co-workers indicating he had committed the crime. Though Criner's employer told police investigators that the time lines made it impossible for Criner to have committed this crime, his testimony was ignored. After years of unsuccessful appeals, Criner submitted to a DNA test. In 1997, the test came back negative. The picture that portrayed Ms. Ogg as a good wholesome girl during the trial indicating that the semen could belong to no one else but her killer, Roy Criner, could not stand up. The prosecutors quickly scrambled for a new theory similar to the theory used in Mr.

Washington's cases. Mr. Criner simply did not complete the sexual assault before murdering Ms. Ogg (Frontline, 2000:10B).

The prosecutors also changed the original portrayal of the innocent victim to a promiscuous girl who slept with everyone she knew. The new theory simply excluded the necessity for identifying who deposited the semen and refocused on the fact that the state had the right man. The Texas court of criminal appeal felt that a DNA test would not have persuaded the jury of Criner's innocence. Judge Keller wrote that there was "overwhelming direct evidence" that established Criner's guilt beyond reasonable doubt. Criner may get a chance to have the DNA evidence heard in a court of law; his case is presently on appeal (Frontline, 2000:11B).

These four cases demonstrate three things; 1) that there is the potential to misuse DNA even though it is considered the most efficient crime-fighting tool yet it is not sufficient to clear people already in prison. 2) The state and criminal justice officials believe in DNA evidence. If they did not, they would not be holding back its use in possible wrongful convictions. 3) The usage of DNA evidence is controlled and manipulated by the state to cover up its wrongful convictions of innocent people, engendered by biases and discriminatory presumptions about its infallibility as an institution. More importantly there could be a flood of requests for DNA tests.

The state's mandate to protect the people is not apparent when in order for Mr. Charles to have freedom, he had to give into blackmail. The protection of the state and state

interests, happen to be more valuable than determining innocence or acknowledging wrong doings. These cases show that innocence does not matter in that new evidence or theories elaborated by criminal justice officers can keep an innocent man in jail. The state controls whether or not prisoners will receive a new trial, get out of jail, or spend a lifetime behind bars. We allow criminal justice officials to have control and we have allowed the state to deny the accuracy of DNA outright. The State can conclusively identify a suspect and easily construe DNA evidence to fit its needs. Even Gov. Wilder had his own agenda and was willing to spare Washington's life, without giving him freedom. DNA evidence and the dying declaration of the victim was strong evidence that Washington was innocent.

Judge Keller who examined Roy Criner's appeal proves precisely that DNA is not enough to consider the already convicted individual innocent. In a rape case after a conviction, even a test, which proves that the convicted person's sperm does not match, is not enough grounds to reverse a judgement. The DNA test cannot prove him/her innocent. DNA after the fact, is negative not positive evidence. Before a trial, it is up to the state to prove the accused guilty. After the fact, it is up to the accused to prove that he is innocent that is his burden under the law. Indeed, the notion of DNA means different things in different contexts (Frontline-Keller, 2000).

Saying it is better to let one hundred guilty men go free than to punish one innocent man does not reflect some of the actions and incidents discussed in this chapter. As a society, we afford a certain margin of error to the state and criminal justice for our own

protection. In return, the criminal justice system addresses the fear of the public apprehending, convicting and punishing the guilty. The fear of crime can be crippling and, as a society, we associate peace of mind with effective policing, swift prosecution and punishment for those who break the law. The question remains however, what price we are willing to pay for this peace of mind.

Although wrongly convicted people are being exonerated by DNA evidence and we are rectifying some mistakes, this issue raises the question of why and how mistakes were made. Eyewitness or victim testimony, jailhouse informant, and misconduct on the part of the criminal justice system can lead to an innocent person spending years behind bars. Even though studies have shown that the estimates of wrongful conviction or the causes are minimal there is need for concern. A system that wants to control crime and criminals through efficient and effective management needs to impose the same standards and assessments within the system.

DNA technology offers the criminal justice system and the public the possibility of greater efficiency in managing crime but it must be held to the highest standards: even if this means that the criminal justice system has to admit serious mistakes that have led to injustices.

Conclusion

In this thesis I set out to examine the trend to implement DNA technology into the criminal justice system. I wanted to explore the role DNA has had in the crime control processes that characterize the new “tough on crime” approach to deal with crime and criminals. The history and the impact of DNA technology on society were incorporated to provide an overall understanding for the basis of this study. I also wanted to examine how DNA technology would effect the agents and agencies of the criminal justice system if DNA evidence did not support their perception of justice or threatened the integrity of the system itself.

This study has shown that the use of DNA technology in the criminal justice system is a result of its effectiveness and efficiency in identifying offenders. The government and criminal justice system have determined that DNA technology is a tool that offers the administration of justice a better way to control and manage criminals.

The theoretical framework of this project is based upon risk management, where people treat crime as a normal social fact of society. It has been shown that the unpredictability of victimization creates fear, which leaves the public intolerant of those who commit crime. To address public concerns the government and criminal justice system have searched for a more efficient and effective way to manage crime. The changes represent a shift from a rehabilitative system to a “tough on crime” approach. In the past the criminal justice system and outside institutions, worked with offenders and society at large to reinforce informal social control in order to deter crime. This study has shown

that the present system focuses on reducing crime through controlling the offender and those who pose a risk to society.

The approach is a “tough on crime” framework to reduce the possibility of crime. To do this, the criminal justice system has implemented a “Three-Strikes” program, Boot Camp for first time offenders, less parole, lengthier sentences and so forth. The criminal justice system has employed deterrent factors and risk management strategies that complement the aforementioned programs to assess and better control the problem of crime and criminals.

The methodology behind risk management is to identify, evaluate and control criminals, or simply stated to assess the problem. One explanation for this method is that risk management coupled with the introduction of DNA technology and data bases, has created the “ideal” for perpetually surveying a class of people that are seen to be risky. This “risky class”, that may be considered un-rehabilitative, can now be monitored by DNA technology since the criminal justice system cannot incarcerate everyone.

In general the public is in support of the changes the criminal justice system has made to assess, manage and control crime. The findings of this study show that the public has also taken on part of the burden to reduce crime. Citizens have devised their own personal risk management initiatives that aim at reducing the potential victimization, or lessening a loss if a crime does occur. “Public minded” prevention has become popular with “Neighborhood Watch” programs and “Save Our Streets” campaigns, bringing

communities together to protect each other. It has also been found that some communities have moved to private protection. Citizens contract out security, creating private gated or patrolled communities. All of these endeavors are to reduce crime occurrence, or make it more likely that the offender will be apprehended.

This study supports the idea that technology has greatly aided the endeavors to protect the public from victimization, detect crime and identify criminals. Of these tools, DNA technology/database, in its short presence, has been of the utmost importance in fulfilling the need to manage and control crime. The legislature has legislated the use of DNA in Bill C-3, designating the offences that DNA can be collected and stored for. Bill C-104 empowers the police to seize DNA samples for the designated offences.

Although we have established the benefits of DNA technology, there are many people and civil libertarians who believe that the taking and storing of genetic information is an invasion of privacy. The fact that genes can disclose valuable information about a person and their family, is the basis for this controversy. The criminal justice system has tried to reassure the public that genetic information will be used only to identify criminal offenders and free innocent people who have been wrongly convicted.

This study supports the findings that the criminal justice system has had tremendous success with using DNA evidence to convict offenders, reopen "Cold Cases", close old "unidentified person" cases, and so forth. The criminal justice system has also seen some landmark cases, as discussed in this paper, of wrongly convicted individuals being freed

because of exculpatory DNA evidence. The result is that DNA is working in the best interest of the public. However, it has been established that there is no way to positively determine how many people are wrongfully convicted each year, or how many sit in jail knowing they are innocent. Since we are not privy to such information, recent changes to American laws have put tighter limits on time frames for appeal. This may indicate that there are more than the low estimates we have seen in studies done on wrongful convictions. The limitations on appeals, according to cases explored in this study, may also be connected to the role the criminal justice system plays in wrongful convictions. The exposure of a large number of wrongful convictions, may have a serious negative impact on the integrity of the criminal justice system. The findings of this study show that by limiting the possibility for appeals or not allowing DNA testing for convicted offenders, the government and criminal justice system may be using DNA technology “only” to their advantage. Consequently, the standards that brought the use of DNA technology into our system—to convict and clear wrongly convicted individuals—have been compromised. This study through case examples, indicates that a small percentage of wrongful convictions may be due to misconduct on the part of agents and agencies of the criminal justice system. Therefore this study finds the criminal justice system may be compromising the efficiency and ability of DNA technology to maintain an aura of infallibility.

Bibliography

ACLU.

- 1999 "DNA Testing." Massachusetts DNA Testing Q+A (August).
www.aclu-mass.org.

Adler, Jerry and John McCormick.

- 1998 "The DNA Detectives." *Newsweek Magazine*, Nov. 16, 1998.

Alexandria, Virginia.

- 1996 "Convicted by Juries, Exonerated by Science: case Studies in the Use of DNA Evidence to Establish Innocence After Trial." National Institute of Justice, U.S. Department of Justice Office of Justice Programs: 161258.

American Psychology Association.

- 1999 "Encyclopedia of Psychology: Eyewitness Testing." Published by the American Psychology Association. (ed.) Corisini, Raymond., Anne Anastasi, Mary Allen and Alan Auerbach.

Amnesty International.

- 1998 "United States of America: Rights for All Fatal Flaws: Innocence and the Death Penalty." Report AMR (Nov) 51/69/98.

Anderson, Barrie, and Dawn Anderson.

- 1998 "Manufacturing Guilt: Wrongful Convictions in Canada." Halifax, Fernwood Publishing.

Armstrong, Ken and Maurice Possley.

- 1999 "The Verdict: Dishonor." *Chicago Tribune* January 10, 1999.

Bassan, Daniela.

- 1996 "Bill C-104." *Faculty of Law Review* vol. 54, Number 2-U.T.Fac.L.Rev.246.
Copyright University of Toronto.

Beaubien, Roxanne

- 2000 "Area Serial Killer Identified." *The London Free Press Online*, February 15, 2000. www.lfpress.com.

Bertram, Eva and Keneth Sharpe.

- 1997 "The Unwinnable Drug War: What Clausewitz Would Tell Us." *World Policy Journal*, Winter 13, no. 4 pp.41-51

Biotechnology Industry Organization.

- 1990 "Biotechnology in Perspective." Washington, DC: Biotechnology Industry Organization.

- Black, Donald.
1984 "Towards a General Theory of Social Control: Volume 1 Fundamentals." Academic Press, INC. Canada.
- Blatchford, Christie.
1999 "Ego's put aside in hunt for rapist." *National Post*, Sept 29, 99.
www.nationalpost.com.
- Califano, Joseph Jr.
1994 "It's Drugs, Alcohol and Tabacco, Stupid!" The Center on Addiction and Substance Abuse at Columbia University. Annual Report. pp.6-11.
- Castel, Robert.
1991 "From Dangerousness to Risk," in G. Burchell, C. Gordon, and P. Miller (eds.), *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press, pp.281-98.
- Chaiken, Jan. Ph.D.
1999 "Correctional Populations in the United States, 1996. Bureau of Justice Statistics. U.S. Department of Justice. April NCJ 170013.
- Christie, Nils.
1993 "Crime Control as Industry." London and New York: Routledge.
- Currie, Elliott.
1998 "Crime and Punishment in America." Metropolitan Books/Henry Holt & Company. New York. A.
- Department of Justice
1995 "DNA: Background." Ottawa: Department of Justice. A
- Department of Justice
1995 "Obtaining and Banking DNA Forensic Evidence." Ottawa: Department of Justice. B.
- Department of Justice
1998 "Government Response to the Ninth Report of the Standing Committee on Justice and Human Rights." Ottawa: Department of Justice.
- Fisher, Bonnie.
1993 "Community Responses to crime and Fear of Crime." In B. Forst (ed.), *The Socio-Economics of Crime and Justice*. Armonk, N.Y.: M.E. Sharpe, pp.177-207.
- Forst, Brian
1994 "The Socio-Economics of Crime and Justice." Sharpe, M.e., Inc.

Frontline-PBS.

1997 "What Jennifer Saw: Summary of Cotton's Case." Written Produced and Directed by Ben Loeterman. Frontline Show #1508 aired Feb. 25-1997. A

Frontline-PBS.

2000 "The Case for Innocence." Written Produced and Directed by Ofra Bikel. Frontline Show #1808 aired Jan. 11, 2000. B

Frontline-PBS: Gershman.

2000 "the Case for Innocence: Interview with Former Prosecutor. Bennet Gershman." Written Produced and Directed by Ofra Bikel. Frontline Show #1808 aired Jan. 11, 2000. .

Frontline-PBS: Liebman.

2000 "the Case for Innocence: Interview with Jim Liebman-Constitutional Law Professor at Columbia Law School." Written Produced and Directed by Ofra Bikel. Frontline Show #1808 aired Jan. 11, 2000. .

Frontline-PBS: Keller.

2000 "the Case for Innocence: Interview with Judge Sharon Keller." Written Produced and Directed by Ofra Bikel. Frontline Show #1808 aired Jan. 11, 2000. .

Frontline-PBS: Shieck.

2000 "the Case for Innocence: Interview with Barry Scheck Law and Director of Clinical Education at Benjamin N. Cardozo School of Law New York." Written Produced and Directed by Ofra Bikel. Frontline Show #1808 aired Jan. 11, 2000.

Garland, David

1996 "The limits of the Sovereign State: Strategies of Crime Control in Contemporary Society," *The British Journal of Criminology* Autumn, 36(4): 470-92.

Gerlach, Neil.

2000 "Instrumental Justice: Constructing the Canadian DNA Data Bank. The Department of Sociology and Anthropology. Concordia University.

Globe and Mail.

1995 "Picture Imperfect." January 21:D8.

Gomme, Ian.

1995 "From the Big House to Big Brother: Confinement in the Future," in *the Electronic Eye: the Rise of the Surveillance Society*, pp. 55-79.

Gomme, Ian.

1998 "The Shadow Line: Deviance and Crime in Canada." Harcourt Brace & Company, Canada.

- Green, Harold.
1990 "The Law-Science Interface in Public Policy Decision Making." *Ohio State Law Journal* 51.
- Greenwood, Peter W., C. Peter Rydell, Alan F. Abrahamse, Johnathan P. Caulkins, James Chiesa, Karen E. Model & Stephan P. Klien.
1994 "Three Strikes and You're Out: Estimated Benefits and Costs of California's New Mandatory Sentencing Law." Santa Monica, CA: RAND.
- Hagan, John
1990 "The Disreputable Pleasures: Crime and Deviance in Canada." McGraw-Hill Ryerson Limited, Toronto.
- Harlow, Wolf Caroline. Ph.D.
1998 "Profile of Jail Inmates 1996." Bureau of Justice Statistics Special Reports. U.S. Department of Justice. April 1998, NCJ 164620.
- Huff, Ronald, Arye Rattner and Edward Sagain.
1996 "Convicted But Innocent: Wrongful Convictions and Public Policy." Sage Publications.
- King, Jack.
1998 "The Ordeal of Guy Paul Morin: Canada Copes With Systemic Injustice." National Association of Criminal Defense Lawyers (NACDL). Canada: The Champion Magazine.
- Martin, Maurice.
1995 "Urban Policing in Canada: Anatomy of an Aging Craft." Montreal: McGill Queen's University Press.
- McMahon, Maeve. Dr.
1997 "Control as Enterprise: reflections on Privatization and Criminal Justice." Social Justice, Social Inequality and Crime, Speech at President, St. Thomas University, Fredericton.
- McNamara, Joseph.
1999 "When Cops Become the Gangsters." *Los Angeles Times*. September 21 1999. www.latimes.com.
- Phillips, Bruce.
1998 "Bill C-3, the DNA Identification Act Standing Committee on Justice and Human Rights." Privacy Commissioner of Canada (Canadian Government) February 12, 1998.
- Rangle, Larry.
1995 "Crime Scene." Avon Books, New York.

- Reno, Janet.
1996 "Message from Attorney General Janet Reno: Convicted by Juries, Exonerated by Science." National Institute of Justice, U.S. Department of Justice Office of Justice Programs: 161258
- Roberts, Julian V. and Anthony N. Doob.
1997 "Race, Ethnicity, and Criminal Justice in Canada." University of Chicago Press.
- Rock, Peter.
1989 "Helping Victims of Crime: The Home Office and the Rise of Victim Support in England and Wales." Oxford: Clarendon Press.
- Rohrlich, Ted and Steve Berry.
1998 "Judges Deal Blow to Use of Jailhouse Informants". New York Times Staff Writers (www.nytimes.com).
- Shichor, David.
1997 "Three Strikes as a Public Policy: The Convergence of the New Penology and the McDonaldization of Punishment," *Crime and Delinquency* 43(4): 470-92.
- Science Watch.
1995 "Sir Alec Jefferys on DNA Profiling and Minisatellites." ISI Newsletter. Science Watch, April 6(4).
- Sleek, Scott.
1999 "Eyewitnesses." American Psychological Association (Feb) 30:2.
- Snider, Laureen.
1998 "Understanding the Second Great Confinement." *Queens Quarterly* (Spring). pp.29-46
- Solicitor General Canada.
1996 "Establishing a National DNA Data Bank: Summary of Consultations." Canadian Government January. 18, 1996.
- Solicitor General Canada.
1998 "Federal Government Stands Firm on National DNA Data Bank Commitment." Government of Canada May 1, 1998. A
- Solicitor General of Canada.
1998 "Establishing a National DNA Data Bank: Consultation Document." Service Canada. B
- Statistics Canada-Juristat.
1997 "The Justice Fact Finder." Catalogue no. 85-002, Vol. 19, No. 7

Street, John.

1992 "Politics and Technology" Guilford Press. New York.

Synnott, Anthony.

1996 "Shadows: Issues and Social Problems in Canada." Ontario: Prentice-Hall Canada Inc.

Wade, Nicholas.

1998 "FBI Set to Begin Using National DNA Database." *New York Times*, Dec. 10, 1998. www.nytimes.com.

Walsh, James.

1995 "the Lessons of the Trial." *Time Magazine*: Vol. 146, No. 16)

Wisotsky, Steven.

1993 "A Society of Suspects: The War on Drugs and Civil Liberties." *USA Today Magazine*, July: 17-21.

Wells, G.L. and Amy L. Bradfield,

1993 "What do we know about eyewitness identification?" *American Psychologist*, 48, 553-571.

Zachariah, John K.

1996 "Correctional Boot Camps: A Tough Intermediate Sanction." National Institute of Justice Report. February, NCJ 157639.