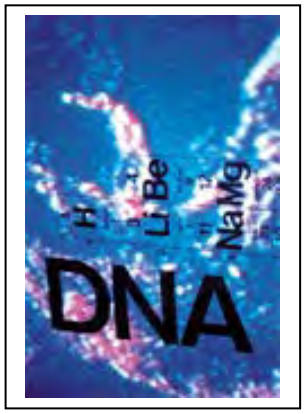
GENETICALLY MODIFIED JOBS

Will the developments in genetic screening serve to bring better alignment between workers and their jobs? With the retirement of the "baby boomers", applicants for some jobs may become scarce. Could job applicants then demand of his or her intended employer that certain of his or her genetic sensitivities be taken into account of as part of an employment contract? Fantasy or a Brave new world? Could job applicants then demand of his or her intended employer that certain of his or her genetic sensitivities be taken into account of as part of an employment contract? Will the developments in genetic screening serve to bring better alignment between workers and their jobs?



"There is no Gene for Fate" *[4A1]*

Content

EXECUTIVE SUMMARY.

General Outline. During the latter part of the nineties, Jacobs stated that "knowledge in the field of genetic screening was advancing rapidly and because of this, it was essential that regard for human rights was not undermined" [17]. Since that time, 12 years have passed, and "the science of genetics is a quickly growing field, which has many implications in the future of health care" [17]. Agius and Seaton on the other hand have the view that there has been a "tendency to ascribe to this knowledge an ability to predict future illness and likelihood of fatal disease" [25]. Given that society is lagging behind in the knowledge of genetics, this paper attempts lift the mythical veil of genetic science and creates a platform of understanding by focusing on genetic screening and its association with the workplace. A good starting point for further discussion is that we can take comfort from the words uttered by Jerome in the film Gattaca that "there is no gene for fate" [12]

SCOPE

Purpose. The opinions contained within this subject material are mine and mine alone and are based on the research undertaken. These opinions focus on the association between genetics, screen testing, the world of work and interests of the employee, employer and external stakeholders such as insurance organisations. Furthermore I will be addressing privacy and discrimination issues and ethical standards that may affect the current boomer generation and that of the future.

DEFINITION

Genetic Information. "Almost all information about a person's health and physical well-being can be called genetic information. A casual glance reveals information about a person's gender, race, height, weight, and other features that are related, in whole or in part, to that person's genetic inheritance." [3]. Additional definitions are at Annex A.

Genetic Screening. *What then is genetic screening?* Suzuki and Knudson advise us that genetic screening is "the examination of the genetic constitution of an individual" [8].

Genetic Monitoring. The examination, at regular intervals, for chromosomal abnormalities in samples of cells from a person who may be at risks in their employment, exposure to agents that cause genetic damage [7].

Workplace. A unit if business whether in public or in the private sector where an economic activity is carried out on an ongoing basis with human and material resources [7].

SOCIETAL PERCEPTIONS

What are the social implications? Within Australia "there is very strong public support for breakthroughs promising better medical diagnosis and treatments, and for assisting with law enforcement; on the other, there is some general fear about uncontrolled or 'mad science', the spectre of eugenics, threats of biological warfare, the loss of privacy, and the increased possibilities for genetic discrimination" [26]. That the individual should be free from a society that controls industry, economy and regulates finance including patents and copyright matters. Agius and Seaton is of the opinion that "those who promote the idea that selection of workers might be influenced by knowledge of the genomes of individuals; do not take account of the principles of occupational medicine, nor of disability discrimination legislation" [25].

Further to this Martinovic has commented that "there is widespread community concern that as developments in human genetics are occurring rapidly, the law will fall behind and not able to adequately protect the privacy of the individual" [28].While in the United States studies according Rawbone; have shown that "employers tend to favour screening and oppose monitoring while workers oppose screening and prefer monitoring" [11]. Does this mean that employers of the future enforce the genetic screening or will they turn a blind eye when faced with a resume that appears to suit them and that of their particular industry. Will the employer consider other than genetic attributes when considering employing new staff? See Annex I for additional Societal expectations and recommendations.

SCREEN TESTING

Genetic Assessment. Genetic testing may categorised as medical, identification and kinship. Medical testing involves diagnostic, predictive pre-symptomatic, genetic carrier screen pre-implantation and pre-natal. Identification is used mainly by law enforcement agencies, missing persons or for the deceased. Kinship reveals incidental information about parentage. An analysis of its effectiveness can only be assessed by the evidence for and against screen testing in the workplace. At the present moment it would appear that screen testing is only allowed in a minority of cases. One positive note in favour of genetic testing is in the USA where in "2002, 123 convicted offenders were exonerated, including a number in death row as a result of genetic testing." [9].

RELEVANCE

Does it achieve its purposes? In the opinion of one Danish physicist, ("Niels Bohr), who states that "prediction is very difficult, especially when it concerns the future" [2] As genetic testing diagnosis and counselling becomes less costlier, large organisations such as the hospitals and clinics may lose their monopoly and become an arm of primary care. On a more positive note, Magnusson believes that "the promise of extended life, improved resistance against disease and the recovery capacity of after trauma will sustain our appetite for medical technology and new therapies" [2]. "As most genetic conditions are multifactorial in nature, genetic information often indicates no more than a possibility that an individual will suffer a disease or condition in future" [24]. Therefore an individual may never develop or succumb to the disease or the condition; and if they do, regular health checks are better indicators of risk.

Validity and additional individual information. Thirty five years ago it was considered difficult to obtain information on an individual and the only organisations capable of collecting personal information were Governments departments, law enforcement agencies and private investigators. A detailed list of personal data stored by organisations is at Annex C. Today, it is possible to obtain much of on a person merely by using the internet and asking the right questions. If this is the case, then genetic testing should only be conducted and considered valid when it meets the following criteria:

"Its relevance to health protection of worker;
The reliability and reproducibility of the test; and
The level of predictive value for the test" [7].

RELIABILITY

Quality Outcomes. Given that the current accelerated advances in genetic science, there is no reason what so ever for genetic testing to be infallible. Laws of nature however will dictate whether errors will occur. In such cases, inbuilt safeguards and procedures can be implemented to reduce any like hood of error. See annex D.

Human Genetic Qualities. **"**Each individual's genetic information is unique to that person alone, but it can also reveal information about a person's blood relatives" [5]. It is therefore extremely doubtful that the sort of qualities that make for a good worker in tomorrow's workplaces be revealed by genetic testing. Genetic testing does not identify the learned psychosocial human qualities such as honesty, tolerance, kindness, optimism, loyalty and love as distinct from self-absorption, impulsiveness, sociopathy, passive-aggressiveness, substance abuse with violence **[*1].*** Genetic screening is not compulsory, a time will come when genetic ethics, contract law and screening methods will combine to provide a foundation upon which genetic material is made available in future of industries.

Genetic Value. We find that in Otto's "Ethical Issues of Genetic Engineering" [8] that "there are already people claiming they were refused health insurance due to genetic traits" [8]. In such cases, how are these to be insured and are they not discriminated based on the policies of third parties. At the moment genetic testing as part of the pre-employment policy is that "ethical principles suggest that such testing should be entirely at the discretion of the individual who should have complete control of the use of the information so obtained", according to Palmer, Cox and Brown[10]. This will enable the worker to make an informed decision their compatibility with the job description. The employer should they feel it necessary that proof of acceptable genetic makeup for the job may have to take into consideration, privacy, human rights and discrimination legislation.

GENETIC MONITORING

Industry Employee Monitoring. There are number industries that undertake regular health checks to monitor employees' health and capacity to remain in a known hazardous workplace environment such as the lead and asbestos industries, or in the case of "candidates for flying are screened for the sickle cell trait" [10]. Other industries such as nuclear plant operators, certain military personnel, paramedics, law enforcement occupations may also be subject of genetic monitoring. In industries such as these, "the results of genetic monitoring could reveal a hitherto unappreciated risk to health and hence of public health relevance" [7]. On the other hand, any "action taken as a consequence of monitoring, such as moving an employee to a different position with a lower level of exposure may, however be discriminatory, or perceived to be so" [14]. Structures would therefore have to be built on a multilateral level that will produce positive results and encourage society to have a greater understanding genetic science.

RIGHTS

Rights are seldom absolute because ethics quite often compete, [1]. There are the critics such as Andre and Velasquez who believe that "while a person's skills, knowledge or experience may be relevant in deciding whether a person is currently capable of performing a job, a person's genetic traits are not" [27]. This may be a powerful argument towards an individual's rights and voluntary genetic screening; it also raises complex legal ethical factors that need to be considered. **"**Society demands ascendancy of individual rights over those of institutions, but what rights should institutions have" ***[1].*** Rawbone in the "Future impact of Genetic Screening in Occupational and Environmental Medicine" [11]; is of the belief that individuals "who fail to reveal genetic information to a potential employer, may be construed as amounting to fraud?" [11].

Consider then the worker, who is aware that their genetic makeup is not compatible to that of the job description, decides not to disclose the information for fear of losing their livelihood. In situations such as these, it should not be a surprise to find that "employers reluctant to use genetic information, to exclude workers" [15] are pressured by insurance companies to collect genetic information. Insurance companies of the future may not want to pay compensation, because the employer failed to take in to account the worker genetic invalid attributes for the job. However in the future according to Rawbone, "genetic tests will be improved and tests will become more reliable allowing the identification of susceptibility to specific hazards" [11], which will demystify the aurora that surrounds genetic testing.

PRIVACY

Who owns genetic information - Individual or the family? If a gene is found that may cause a disease in the future in one family member, should a sibling be alerted to it? The answer to this came from a government inquiry into the Protection of Human Genetic Information in Australia. In its recommendations the inquiry put that: "The Commonwealth should amend the Privacy Act 1988 (Cth) (Privacy Act) to permit a health professional to disclose genetic information about his or her patient to a genetic relative of that patient where the disclosure is necessary to lessen or prevent a serious threat to an individual's life, health or safety, even where the threat is not imminent." [*21]* A fine line exists between genetic information and health information regarding an individual's privacy and as such science must tread warily. At moments like these the spectre of confidentiality and privacy as to have the rights to genetic information begins to emerge and reasserts itself as the champion of the individual. Harris, Bell and Porteous state that "genetic tests look set to become an important part of everyday clinical practice" [29] and that "if an individual did not want to share test results, his or her rights should be respected" [29].

EMPLOYMENT

Genetic Test Trials. In the USA "where genetic testing has been used at work, was applied it has been a disaster" [13]. Furthermore, in 2003 The Human Genetics Commission in the UK found that "genetic tests cannot accurately predict which workers will suffer future disability or illness" [A4]. "In January 2002, Australian unions said employers should be prohibited from requiring, requesting, collecting or disclosing information derived from genetic testing of current or potential employees" [13]. There are self interests groups who are lobbying to accelerate the implementation process of genetic testing but have so far failed. What then does this mean for the future of genetics in the work place? I am of the opinion that in the future, society will embrace genetic testing as more information becomes available and evidence of its heath related benefits emerge.

Employer Interests. "An employer could use the results of such tests to exclude job applicants on the basis of predicted future health" [7]. Better still, an employer may "use such information to deploy workers in areas appropriate top their particular genetic makeup or to exclude them from employment" [7]. This attitude of employers in attempting to use a loop hole in worker exclusion does not replace employer's obligations to take steps to control, contain and remove hazards from the workplace.

Employee Interests. A person's ability to work is important to his or her financial security, self esteem, and community involvement" [32]. Employees being aware of their genetic information may utilise it to "make informed decisions with regard to the type of work they would seek for their own long term health and safety" [7].Professor Johnstone has commented that employers often sees pr-employment screening as part of their managerial prerogative to fire and hire as they choose" [30].

Job Selection. Under the Disability and discrimination Act (DDA) it is not considered discriminatory to undertake pre-employment medical tests providing they are directly related to the job, an interview selection process based on merit, aptitude tests for certain industries, submission of a resume with personal history and details, references, Questionnaires on past medical history, that may impact on the health and safety of the applicant and those of the workplace. An exemption to include genetic testing is allowed in specific cases where the risks involved may impact on the health and safety of the applicant. Such exemptions at this point in time are rare if OH&S can be utilised instead. See Annex F on submissions for exemptions to the rule.

OCCUPATIONAL HEALTH AND SAFETY

Duty of Care. Employers are obliged to provide a workplace environment that is safe and free from any physical and psychosocial hazards. Therefore there may be some employers who may literally interpret the Victorian OH&S Act 2004 to suit their particular needs. Employers under the guise of protecting their employees and to remain compliant with OH&S legislation may use these arguments to request and enforce and sustain genetic testing. In fact in the sixties, "attempts to introduce genetic screening were soundly rejected because occupational and environmental factors were a far more productive focus of preventive action" [13].

DISCRIMINATION

Genoism and the Disability & Discrimination Act. The Disability & Discrimination Act (DDA), currently "provides that a person who cannot perform the inherent requirement of the job, need not employed and may be dismissed without unlawful discrimination occurring" [14]. Genoism amongst certain industries is a term used when applicants are discriminated for their genetic makeup when applying for a job. At this stage there is insufficient material evidence that points to any genoism being practiced by employers and other stakeholders such as insurance companies. "To date HREOC has received only three complaints involving genetic status" [14]; but this will rise as advances in Genetic science evolves and the costs of genetic testing becomes more affordable. Genoism may end up becoming a household world as it impacts job applicants and insurance purposes such as life, income protection, trauma, sickness, travel, health and general insurance.

The current Human rights and Equal opportunity Commission Act 1984 (HREOC) prohibits employers from discriminating in the following:

- "selection process;
- terms and conditions on which a job is offered;
- terms and conditions offered during employment;
- training and promotion opportunities provided; or
- termination of employment" [30].

FUTURE WORKPLACES

What will they be like - probably far fewer nasty exposures. In the future, only positive attributes will be placed on a resume if there is one. However given the rate of technology and the accelerated pace of genetics, there may be no need for a resume and a urine or saliva test may be sufficient to meet the needs and requirements of genetic testing. LaDou says that if "there is controversy about the role of genetic factors and the development and use of genetic screening tests to identify individuals with increased susceptibility to toxic agents in the workplace" [4]; how will that impact on a worker applying for a job involves exposure to chemicals?

Society will have come to accept it as the normal process of identifying suitable occupations, individuals will use their genetic information to make informed decisions about their health and take preventive precautions. Job applicants may find that applying for a job may not be as stressful due to genetic testing and society will have confidence in the genetic information being used effectively without impinging on a person's privacy. There will also be procedure in place for individuals to apply for positions that are incompatible with their genetic makeup and be considered on their merits. This is an ideal future world where the brave meet the future with optimism.

RECOMMENDATIONS

Considerations. Given the limitations, it has not possible to address every known issue regarding Genetic screening and its association with the world of work, but has focussed on relevant societal matters that are of interest to the individual. The recommendations at Annex B are merely pointers upon which to build upon enable the individual to keep abreast of future advances in genetic science.

CONCLUSION

Final Analysis. The "current mobility of the Australian workforce, it is unlikely that genetic information be sufficiently relevant to an applicant's or employees ability to perform the inherent requirements of the job during a probable period of employment" [20]. In the final analysis, one must remember that genetic information is but another tool in the medical profession that can be used for positive and negative concepts. Society must regulate how that information is to be used. It is in the best interests of all stakeholders involved, especially that a balanced solution is found in relation to genetic screening and job compatibility. It also equally important to recognise an individual's right to their own genetic makeup and that voluntary genetic screening is not subject to the interests of external bodies.

Genetic knowledge and information will continue to be "a source of continuing anxiety, particular in societies that are not united by a single, shared vision of humanity's purpose" [2]. Genetics is here to stay and quicker the public is informed about such advancements in genetics and their association with the workplace, the better. Presently the majority of the public is finding it difficult to keep pace with the daily breakthroughs ands in the field of genetics and there some concern where genetics may outstrip that of the public. "The challenge for our society is to maintain its moral and ethical compass, supporting those aspects of genetic science that reduce, pain and suffering and increases the quality of life" [3]. For additional information relating to genetic screening see Annex G.

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DEFINITIONS

The following definitions are for the purpose of this Document:

1. *Genetic Testing. The use of a scientific test to obtain information on some aspects of the genetic status of a person. Indicative of a present or future medical problem [7].*

2. *Genetic screening. The use of a scientific test to determine whether a person possesses particular variant forms of one or more genes in his/her genome [7].*

3. *Employer. The natural person or legal entity, whether public or private, party to employment contracts or employment relationships with employees [7].*

4. *Employee. Any person, who is protected as a worker or as an employee under law. Moreover the term employee comprises candidates for a post whatsoever as well as former employees [7].*

5. *Workplace. A unit if business whether in public or in the private sector where an economic activity is carried out on an ongoing basis with human and material resources [7].*

6. *Genetic Monitoring. The examination, at regular intervals, for chromosomal abnormalities in samples of cells from a person who may be at risks in their employment, exposure to agents which cause genetic damage [7].*

7. *Genetic. The science of heredity, dealing with resemblances and differences of related organisms flowing from the interaction of their genes and environment" [22].*

8. *Genetic Under class. A group of people shown by genetic testing to have a more than average risk of incurring a disease, who may be discriminated against by insurance companies employers, etc" [22].*

9. *Genetic Information.* "Almost all information about a person's health and physical well-being can be called genetic information. A casual glance reveals information about a person's gender, race, height, weight, and other features that are related, in whole or in part, to that person's genetic inheritance." [3].

RECOMMENDATIONS

The following recommendations are subject to change upon additional information becoming known in the advances of Genetic Science:

a. Genetic Screening is conducted to ascertain health and safety of employees in hazardous environments and industries as discussed elsewhere in this paper;

b. Where there is potential risk to genetic damage, employers take steps to eliminate the hazard.

c. Employers as a general rule, should not be allowed to perform genetic screening,

d. Employers as a general rule, should not ask employees to undergo genetic testing;

e. Permit genetic testing in cases where genetic testing may be necessary to ascertain and guarantee the health and safety of employees;

f. Genetic information not provided to a third party, such as insurance, industry bodies including family;

g. Genetic information remains confidential and belongs to the individual;

h. Legislation be created to safeguard against misuse and misappropriation of genetic information;

i. Legislation be created to covers all aspects of discrimination based on genetic makeup.

j. Guidelines are created for the collection, testing, screening, monitoring and storage of genetic material in any format.

k. Employers create policies that entail detailed job descriptions and their association with any genetic information requirements of the job, i.e. lead and asbestos industries.

l. In specific hazardous industries, employers should apply for an exemption to be reviewed on a six monthly basis and on its merits that meets OHS standards.

ANNEX C

COMPARISON TABLE

The table below provides a glimpse into the information readily available on the average Australian citizen. Compare both columns and consider why the necessity to provide to third parties for their storage, personal genetic material.

NO	CURRENT AVAILABLE NON GENETIC PROFILE	CURRENT AVAILABLE GENETIC PROFILE
1	Credit cards	Finger prints
2	Birth certificate	Retina recognition
3	Baptismal certificate	DNA recognition
4	Marriage certificate	Genetic information
5	Divorce certificate	Blood type
6	Death certificate	Breath
7	Medicare card	Face recognition
8	Drivers license	
9	Service record	
10	Employment record	
11	Insurance records	
12	Bank records	
13	Travel documents	
14	Passport	
15	Medical documents	
16	Hospital documents	
17	Internet profiles	
18	Emails documents	
19	Photographs	
20	School records	
21	Membership records	
22	Traffic fines	
23	Debt documents	
24	Taxation documents	
25	Domestic bills	
26	Mobile messages	
27	Mobile telephone calls	
28	House telephone calls	
29	Education qualifications	
30	Training certificates	
31	Mortgage documents	
32	Family history	
33	Vehicle registration	
34	Vehicle Road side care registration	
35	Pay pal registration – internet	
36	Online banking - internet	
37	Resume documentation	
38	Company minutes	
39	Post Office box documents	
40	Salary documents	

GENETIC INFORMATION PROS AND CONS

The information below in tabulated formatted does not run parallel to each other and the information is stand alone. The table is subject to review as new information becomes available.

FOR	AGAINST
Assists in Occupational Health and safety of an individual or groups	Not necessary if other preventive action can be taken, such as removing hazards from the workplace in accordance with current OHS legislation.
Job related monitoring, i.e. lead and asbestos industries	Not necessary when other medical treatment and preventive medicines are available
Prediction of future health and safety symptoms	Discriminatory
Assists in the selection of employees for specific jobs such as Police, Defence and other hazardous occupations.	Creates another class of society based on genetic information - Genoism or Genoist.
Preventive action being taken if genetic information indicates health problems.	Costs too much
Information can be sold to third parties	Is not readily understood by the majority of the public
Information can be shared between third parties	

SOCIETAL EXPECTATIONS AND RAPID CHANGE

The following is an extract from the report on planning for the future. A comprehensive and detailed account of this may be found at URL: http://www.austlii.edu.au/au/other/alrc/publications/reports/96/4_Planning_for_the_Future.doc.html

Community participation

Most respondents felt that biotechnology is changing at such a rapid pace that developments cannot possibly be anticipated and legislated against. In addition, it was generally felt that Australian society and government are powerless compared to the international financial and political power of the large multinational companies driving biotechnological innovations.

A key component of concern was the perception that there are no or inadequate controls over the process, motivations and outcomes of the development and application [of] biotechnology and gene technology in Australia. This was particularly a concern for those applications which were seen to raise complex, and disturbing questions about human life.

The Inquiry believes that open and accountable processes that engage with the public are essential for several reasons. They are beneficial:

- for those consulted, because they facilitate civic participation and have a valuable educative function in an area of science that requires lifelong learning;
- for the process of law reform, because those with day-to-day experience of the law can indicate how law and practice actually affect them; and
- Reform outcomes, because laws, codes and guidelines are more effective when the people who will be regulated by them participate in their formulation.
- Widespread community participation in the process of reform or review is thus seen by the Inquiry as essential to maintaining public trust

Rapid scientific changes

Below the Inquiry identifies seven attributes of the reform process, which are aimed at ensuring that the recommendations in this Report meet the needs that are likely to arise in the short to medium term. In particular, and as discussed further below, governments and other public institutions should:

- Promote widespread community participation in the formulation of relevant rules and principles;
- Find appropriate balances between competing interests;
- Adopt processes that facilitate contributions from all relevant disciplines;
- Consider the cross-border implications of the issues, whether they be federal or international in character;
- Consider forms of regulation that are flexible and quick to adapt to changing circumstances;
- Seek simple and effective regulation through greater harmonisation of the regulatory regimes in different jurisdictions; and
- Establish and maintain such institutions as are appropriate to address, on an on-going basis, issues relating to the use and protection of human genetic information.

SUBMISSIONS FOR EXEMPTIONS

The following submissions for exemptions were based on the Genetic Discrimination in Employment, The Protection of Human Genetic Information in Australia. This document may be found at URL: http://www.austlii.edu.au/au/other/alrc/publications/reports/96/30_Genetic_Discrimination_in_Employment.doc.html

A number of individuals and organisations took the view that employers should not be able to request or use genetic information for *any* purpose. This was generally put on the basis that the information is rarely relevant, that it is complex and subject to misinterpretation, and that it is subject to misuse by employers seeking to advance their commercial interests. Some submissions supported a partial prohibition, subject to limited occupational health and safety exceptions.

However, the majority of submissions received in relation to this issue supported the Inquiry's proposal. There was significant support for the proposition that an employer should be able to ask for and use genetic information in limited circumstances, for example, where the information is reasonably required to:

- determine whether a person is able to perform the inherent requirements of a job;
- decide what reasonable accommodation might be necessary to enable a person to perform the inherent requirements of a job; or
- promote occupational health and safety.

A number of submissions expressed the view that the circumstances in which an employer would be able to justify the collection of genetic information consistently with anti-discrimination and occupational health and safety regimes is likely to be extremely limited. The Australian Medical Association (AMA), for example, commented:

The AMA would have serious concerns in allowing employers to collect and use genetic information in relation to their employees. We would find it very difficult for an employer to justify requesting or requiring genetic test information in order to ensure that the individual is able to perform the inherent requirements of the job.

The Australian Chamber of Commerce and Industry (ACCI) did not support further regulation at this stage and submitted that: There are three necessary preconditions for regulatory intervention...with respect to the employment dimensions of the use of human genetic information. They are:

- Demonstrated need for regulation;
- Evidence of regulatory failure, or a lack of appropriate existing regulation;
- Evidence that the benefits of further regulation outweigh the potential costs to employers and employees.

However, concern has been expressed about employers' ability to interpret test results accurately and objectively, given the considerable uncertainty about the quantification of risks and how that information should be evaluated. It was suggested in a number of submissions that, if employers are able to request or require genetic information, these requests and the interpretation of test results should be subject to independent oversight and that authoritative guideline should be developed.

PETER ADAMIS PERSONAL NOTES ON GENETICS AND EMPLOYMENT OF THE FUTURE

Additional social implications? Now that the Genome project has approached the end of research, I draw heavily on the experiences of Agius and Seaton who believe that "it is very likely that many genes will be discovered that influence risks of occupational disease, given adequate exposure, and that future occupational standard-setting and hygiene practice will have to account for this" [25]. Therefore the employer, worker and interested stakeholders may be faced with a dilemma in the future of worker selection; as genetic screening encompasses and crosses many barriers, legislation, ethics, insurance and expected societal morals a brave new world. This is an interesting thought and should be considered carefully to ascertain whether this is what the future of work will be like. Will employers have the ability, the authority, the freedom and the right to employ whom they like or will they be subjected to a code of genetic ethics that dictates who and what individual can work in which or what industry based on their genetic makeup.

Personal implications. Then when the couples begin to live with each other invariably it does not work out. Why? Maybe because the computer does not take into account the individuals make up, their emotions, their health their beliefs their personal motivating factors and much, much more. If this is the case does that mean that this may also happen should genetic screening be introduced into the some near distant future? One may argue that it already occurs in some industries and occupations, yes that may be true but there is no laws governing genetic screening at the moment other that the human right and equal opportunity legalisation where it has enshrined the discriminations aspects to safe guard the worker. What expectations will, the worker, the employers, the government society, and nations have in regards to genetic screening.

While the "Genome project, driven as it is largely by interests related to the cure of disease, it is likely to have relative little impact on the practice of occupational medicine in the short term" [25] On the other side of the coin, "in the longer term it is conceivable that individuals seeking employment will have available their own genome and will wish to ensure that it is compatible with exposure to the hazards of that workplace" [25]. Job descriptions of the future will no longer be in hard copy format if the current trend is to be allowed to unravel at the current pace that technology allows it to operate.

On the other extreme, "some people choose to have preventive surgeries, such as Alicia Altmueller did, upon receiving the results of her genetic screening, opted to have a double mastectomy and a total hysterectomy" [8]. This preventive action by an individual may not be necessary as genetic screening has not reached the level where it can be 100% reliable in its prediction and as such, making life changing decisions based on genetic test results is insufficient for ones future health. However in the overall analysis, it is my belief is that there is no guarantee that the genetic makeup of the individual will enable the worker to cease from taking risks or free from being affected by emotion, diseases and other maladies. Performance is all about doing the job right the first time is all that will matter in the future.

Currently career advisers are using job descriptions to match their clients. At the present moment, technology and medicine have reached the stage where genetic diseases can be diagnosed during the pre-natal period and changes made to remove the damaged or faulty proteins. Imagine a world where genetic syndromes related to mental health are eradicated. Raghavan and Patel state that genes such the "Williams Syndrome which occurs in 1 in 55,000 live births" [23], the "Rett Syndrome , prevalence in 1 to 10,000 births" [23] and the "Down's Syndrome" affecting 1 in 1000 live births" [23]. These undesirable genes may be removed during the foetal stages, thus paving the way for designer births. Will designer births create the perfect human being that is not a burden on society and the health system? "

In this perfect employee environment, the individual with their own genetic makeup will be free to interact with others of different genetic codes and thus contribute to a higher learning amongst the workforce. Alternatively, where "viral genomes will have major influences on design vaccines and our ability to protect workers from microbiological hazards in the workplace" [25] may create an environment that is conducive to increasing productivity in the workplace. If this comes to fruition, there will be less pressure on para medical organisations to provide health support, the economy will be given a boost and overall costs will be reduced. Having touched upon the subject of para medical organisations, I can foresee a time where they will be equipped with genetic material to be injected into injured and ill patients similar to our current blood transfusion. Maybe they will be allowed to inject genetic material or transfer it to an ill or injured person to complete any gaps in genetic malfunction or deficiency.

I believe that our personal characteristics at the present point in time will have no bearing on the future of work for the baby boomer generation, unless genetic engineering and screening is accelerated to include them. Having said this, I am reminded of LaDou who states that while there is evidence of "recessive disorders that primarily affect American black males and Mediterranean Jews" [4], I would prefer to believe that blood and genetic makeup has no nationality. This will includes "thalassaemia, a genetic disease of the blood found especially in people from Mediterranean, Middle Eastern and some dark skinned peoples of Africa" [22].

The Genetic Male and Female Attraction. The other word if I may use here is the word physical attraction and love, what genetic screening process will need to be in place to stop the fraternisation of human whether they of the same genetic makeup or not. What if such a mutation did occur will the offspring be isolated and ostracised. Questions, questions that will require answers and we have not even touched the tip of the iceberg of unanswered knowledge. In the future of our brave new world what will the genetic make be? Will it take generations to weed out the diseased and allow the imperfect human beings to die off gracefully and then ensure that all future offspring are health free from any disease?

It is like screening and manipulating the genes of cattle to make an improved animal for future consumption. Is this how man what was created in the first place and who knows what happened in the past. Maybe we are just tampering with something that happened to the human species a long time ago and that now we are entering a whole brave new world where mankind has mastered the art of life and how to elongate life by manipulating our genetic makeup. It is like a dating game where an individual seeking a suitable and compatible mate enters his or her data into the computer and presto moments later the match is made to with 99 to 95 % compatibility.

Stakeholders of Interest. External stakeholders will have a huge say in what will and not be the in the best interests of the economy. With the current rate of species that are being made extinct, resources will dwindle and more emphasis placed on renewable energies, recycled material and natural foods being replicated from recycled materials. Water and other forms of liquid will be scarce and mankind will have to learn live in close and confined quarters which will impact on their mental and natural instincts. They as a species will be living in rabbit warrens or in mice box structures, sharing food and other resources for consumption. That is if mankind does not reach out to the stars like Columbus did and found the new world where mankind was able to migrate and replace the nations that were living there. External stakeholders would be the insurance companies and their enormous influence on all aspects of the workforce and in the domestic market and environments.

Even at this level, competition and rivalry will still exits. Genetic makeup in this case will mean for nought when the genetic makeup is the same across the board and the individual will have to prove their superiority and or that their qualifications, genetic makeup and life experience are superior to that of the other individual. At the moment in the UK, "the use of genetic information to make a general assessment of an individual's health would not be acceptable and that the right of an individual not to know their genetic makeup should remain" [10]. What will this mean for the mature age worker of the future, as they approach their latter years of life, will they be subjected to genetic screening to access drugs and resources?

Maybe there will be no mature age worker because the word mature age will cease to exist and may be replaced with the term genetic degenerate or genetic malfunction depending on the circumstances. What this will mean is that the worker in this category will placed out to pasture in a location that is for those unable to contribute to the workforce and there deprived of many of the privileges that they once used to. While Murray, Wimbush and Dalton are of the belief that "many issues pertaining to potential genetic discrimination in the workplace have not been adequately addressed" [16], I am concerned at the lack of literature on this subject. Where are and where is the legislation and practical safeguards to ensure that genetics is not misused within the context of job screening and other applications that genetics screening may offer.

In the first place, the rights of mankind should be the centre pillar, followed by the pillars of ethics, morals and legislation that will prohibit discrimination based on genetics. Furthermore legislation must be in place to ensure that employers have the authority to hire anyone they are comfortable that the individual would be able to fulfil the job description without pressure from external stakeholders such as insurers. I would also recommend that employers and employees be adequately protected by law that in the event of an accident that their genetic makeup is taken into consideration for any compensation and health related services. Those insurance companies be blocked and barred from insisting that genetic makeup be included in any screening of jobs no matter the industry.

Employee Rights. What does one say about the employee where traditionally, society has worked hard to look after the interest of the worker and in this case we call them the employee. Does the employee of the future have rights or will his or her genetic makeup also provide the place in society. If this is the case then who will decide who will have what genetic makeup and how will the selection be made. These questions are not of a philosophical nature but are really designed to test our best minds of the future what is to be the best for mankind as a whole and not for but a few of the so called elite. Will the employee be free, will they be able to change their DNA and genetic makeup so that they can progress up the professional jobs ladder. If not, can they transfer their bodies to a clone body that is genetically acceptable to the job and or to the industry? Cloning again, but what can one do if an individual has their heart and desire on obtaining the job of a life time, is it ethical then to clone and harvest body parts to meet job expectations.

Consider then André and Velasquez who state that, “if genetic screening is used to identify workers at risk for work-related diseases, what is to prevent their use to identify workers and families who are risk for disease unrelated to the workplace” [27]. My opinion is that the individual will feel isolated and stigmatised as result of the outcome. What if the individual’s genetic makeup is found to be incompatible with specific job descriptions or worse still the genetic makeup is found to contain faulty genes, will this ostracise the individual from society, friends’ relatives and immediate family. Does it mean that the all of the individual’s relatives will be stigmatised as a direct consequence? These are complex questions that require much discussion and philosophising to ensure that such stigmatisation does not take place on any level and will not contain any risk to the worker.

What safeguards will be in place to ensure that the samples being provided are truly those of the individual? LaDou then goes on to say that “it is questioned whether such tests are accurate and whether job discrimination could result from their use as pre-employment screening” [4]. A glimpse of the future through the “film Gattaca” [4A1], film exposes the flaws and abuses where genetics played a major role in the selection process for jobs. While the candidate was surprised to be told that his urine sample was the actual interview, it also demonstrated how genetics and DNA can be manipulated in the workplace environment.

The Baby Boomer Generation. The baby boomers are the icons of the past. As baby boomers we seem to be hanging in there and holding on for dear life trying to squeeze whatever else we can from the life that we still have and we at times forget to live. Let go and let the new generation takes its place in the future world. Baby boomer will still be here but in much reduced numbers and less of the influential player of the world stage, the baby boomer will require health and services to keep them alive in the next twenty to thirty years.

Past Practices. Do this sound familiar? Of course is it does. Look at the all of the ancient civilizations where a small group on elite governed the masses of humanity beneath them, only to be crushed by them when the elite failed to deliver on their promises. Does this mean that the future of genetic screening will also involve creating a middle class based on a genetic makeup? Scary thoughts again and one would wonder whether we are surpassing Huxley's brave new world. Is it the elixir of life that the Spaniards in the new world wee seeking or will genetics become the new form of natural selection? Are we to return back to the ancient days of the Spartans who wielded a form of genetic screening by visual observation to ascertain if there were any defects? If there were defects, then the child was thrown down a chasm to dies a horrible death.

Future Considerations. Maybe our future scientists may devise some way where we are injected with a DNA that eradicates all known diseases and ensures that our life expectancy increases. Will the future generations be any different tom the Spartans the, I think they will as I have much faith in the ability of mankind to make the right choices when faced with extinction. Job market will be part of the overall industry standards where it will be governed by the needs of the economy and that genetic screening will b e a tool that will enable those in power to place the correct genetic makeup in those industries that require to be filled. One is reminded of the cartoon movie called 'Antz' and it’s a 'Bugs life'. It was where the needs of the ants’ colony took precedence over that of the individual ants for the common god of the colony. Are we not the same under similar circumstances?

This information will be updated on a periodical basis into a central computer that will also provide up to date information regarding the genetic makeup of an individual. In this way all diseases will be monitored, identified and eradicated even if it will mean the death of an individual for the good of mankind. In the event a clone and/or an original human being is infected with the incorrect genetics or is born with defects, laws should be passed not to discriminate against the relatives based on the default genetic makeup of one individual. This will allay any fears on the part of the relatives and similarly for all individuals that work with the infected or defect genetic make of an individual.

For the first time in the history of mankind according Palmer, Cox and Brown; "the world populations are ageing, as birth rates fall and people live longer" [10], the future is unclear and much work needs to be undertaken before science and the rights of man are compatible with each other. Society will demand that legislators create a platform where the objectives for man and that of industry meet and discuss differences regarding genetic ownership, job compatibilities, discrimination and ethical standards; prior to moving forward into a frontier that has yet to be explored.

Will a genetic identity be created as soon as a child is born and will that child have been engineered by the parents and or by industry to fulfil industry needs? This is a thought process that may yet lead to undiscovered frontiers when the parameters and boundaries are yet unknown. Will the appropriate genetic credentials give an individual an advantage over others and can that individual demand to be hired based on their genetic makeup or will employers still retain the right to hire and fire without the fear of being prosecuted on the found that the genetic makeup should have been considered.

Mankind and Genetic Reconciliation? How are we to reconcile the rights of mankind with the future aspirations of industry and who will decide the outcome. In the event that industry is to take the lead and mankind the follower, who within the industry is to decide the fate of genetics and their use to screen workers for industry. Will it be a select few that have been identified to make those decisions based on their near perfect genetic makeup or will it by a democratic process where there will be random selection of beings from across humanity? These are questions as always that will require considerable discussion and much fathom of thought.

The Dilemmas of the Future. The objectives of how to approach this dilemma is no ours but those generations to come. All that we can do is to lay the foundations and ensure that those genetic foundations have appropriate fail safe insurances embedded deeply enough that future generations do not manipulated or create a society that is wholly dependent on ones make up for the distribution of meagre resources. That is if we as a species do not break the barrier of infinite space and make that the new frontier. That would truly create new challenges for mankind. But wait a moment, space travel according to our current line of thinking requires many years of space and time before we even reach our first star that may or may not have similar earth like systems. To achieve this maybe the technology, biology, nanotechnology, genetics and a host of other disciplines may be at play to create the human capable of living in space for long periods of time. I have digressed somewhat, but only to provide a glimpse of what may be possible if genetics are used effectively and appropriately for goals that will benefit mankind. Is this true or is there an element of truth in this. They also say that we all came at one time or another out of one single ancestor who walked upright in Africa and that she populated the earth evolving growing and adapting to the environment. If this is the case may be it is now time that the human race is ready for another genetic mutation. A mutation that will have ever ending positive results on the mankind.

Cloning Advancements. Currently there have been enormous advances in cloning and it will continue to do so despite any government crackdown on scientists trying to improve current models by the use of genetic cloning. Cloning in the future will be the realm of those who wish to remain young and will be able to harvest their organs when their cells deteriorate. The rich and the elite may only be in those positions to be able to afford such luxuries. Organs would be put aside for the individuals similar to another film called the Island where individuals used to clone themselves and then harvest their clone to be used at a time of repair and/or need. Thus delaying death as much as possible. The one thing that may come to realisation is the cloning of bodies for the transfer of the human brain to that of the new clone body thus elongating a person's life span. This really the stuff of futurist and may become a reality.

A scary thought one must say. Will employees have the rights of man still embedded and enshrined in government or will privacy become a thing of the past and be discarded in the interest of society. What about an individual's genetic sensitivities. We did touch upon the subject briefly earlier but not enough to satisfy the knowledge and hunger for learning that one yearns for when discussing a new and potentially new subject such genetics. Will genetic sensitivities involve heart attacks mental disorders, mental, diseases, life expectancies and a myriad of other unwanted and declining human attributes that will be a thing of the past in the future? If this is to become a reality, then whoever is responsible will want to ensure that the many serve the few and if this truly to become reality then the few will be replicated and that their progeny will continue to live on while the mass of humanity wallow in the lower depths of the earth.

Job Applicants. When submitting a resume in today's world of work, an individual will only include his or her best attributes, characteristics and positive employment history, (if they have one). They are not required to give their age and/or their health status. The pre-employment health check is required only with a number of industries and occupations and with the consent of the individual. Agius and Seaton on the other hand believe that despite "sceptical views on the value of pre-employment screening, there are nonetheless number important instances where such assessments are a useful means of reducing risk" [25] in the workplace. Skills and competency in the work place will depend upon the knowledge, qualifications, skills, work experience and the ability to perform the task on hand in a particular occupation and/or industry. They go on to say that "this method of screening like pre-employment assessments is poor at detecting those will prove to cause managers problems'" [25].

Pandora's Box. Having said this we may allow ourselves another digression into the field of, may I dare to say it, genetically modified humans to fit the industry model. We are not inferring to clones, but to humans being injected as previously indicated with the right genes to fit the job of that particular industry. An interesting thought that has the potential to open a Pandora's Box and then lose hope in the process. Once the Pandora's Box is open it is difficult to go back for those who are created will also have the right to have their say. In such cases there may even be a new race of humans that are far superior to our current human species that live on the planet now. What a thought, what potential what an environment will it be where two sets of humans may at odds with each other, seeking out to share what resources remain.

A New Human Race of Genetic Superiority. If this does occur and it is not unimaginable that two species of humans evolve to a point that some integrations and simulation will occur creating yet a superior human with the best of both species. Then we shall, a new race of humans where natural selection of the fittest will occur, normal humans at this stage of evolution may be considered as degenerate of the future may be seen as having inappropriate or unwanted or damaged genes that contain Neural disorders, Manic depressive, heart disorders, short life expectancy, fatal potentiality, Traits Deficit Disorder, Obesity, and other negative genes. Will these genes once they have been identified in mankind, will the human be destroyed, injected with acceptable genetic code that will enable them to lead productive lives and be considered as having a common profile?

So what the future may hold is one set of genes monitoring another set of genes, it sounds as if it out of the set of the film, Matrix. Where "Mr Smith" was the monitor that sought out the undesirable elements of the matrix and destroyed them. There are many other considerations that we must take on board and be prepared to dissect each and every one to ensure that the meaning of each is understood in its entirety. Ethics is one area that should be at the top most mind of all legislators no matter what level what nation and whatever continent that they may be. Ethics will and should play a big part in deciding the best for all of human kind, without ethics morals cease to exist and with morals anarchy will prevail and if anarchy prevails we as a species will descend back into the barbarism that we once knew.

Designer Children? Would not such advances in science be viewed as a positive outcome for parents wanting healthy babies? Will parents be stigmatised for reaching out to science for designer babies so that their children do not become a burden to society. Apart from being seen as playing the Supreme Being (God) what objections religious and individual objections could there be? These are questions that will require not only answers but will also require much discussion prior to their implementation. The expectation on one individual may not be the same of another and how does one contemplate on compiling the expectations into one so that all expectations are compatible or to say that they are as near as possible to 95% compatibility fit.

Foundations for the Future. DNA and Genetic makeup will also be for those who to arrive on this earth in the future, yes not for the likes of us but it is our role and responsibility to lay the foundations for the future so that the generations to come have a focus, an objective or goals that they can strive for. How they reach those objectives is up the m. Whether genetic screening or attributes has something to do with reaching those objectives will be entirely up to them.

This may sound unreal but it is true that due to changes in medical funding some doctors may have been placed in a difficult position where those who were elderly had to wait for the young to be given priority. Security services are another arm of the insurance companies that may be utilised to ensure that ether is no mingling of genetically mixed individuals. Organisations may be serviced by security personnel with the correct genetic make up for the job. The genetic make up for a security may not be as high as that of a doctor teacher, or a scientist but will require analytical skills, good health and genes that match the job description.

You only have to type in "genetically modified screening for jobs and you will be confronted with a myriad of articles and documents that reach back for the past 10 to 15 years when the genome project was started. The genome project was accelerated with the improvements in Information technology and the creation of the super computers. The Genome project is being utilised by scientists throughout the world working feverishly to eradicate current and known diseases from mankind.

Consider the current baby boomer generation should they decide to include their genetic information onto a register, which will enable them to access the new technology that will monitors, screen, and provide safeguards in the event of any illness or sickness in the latter stages of their lives. If genetic testing can promise a future that combines genetic information with prolonged life, a healthier lifestyle and access to genetic material, society will have little or no trouble in accepting this as normal aspects of society. In view of the above, let us be sure about the future of genetics, screening, stressing and monitoring. New industries and markets will be created to deal with and store the information which will have a great influence on the health and safety of works, their families and extended relationships.

Genetic Screening Obstacles. The essential purposes of genetic testing are to reduce morbidity and mortality and provide information about a person's health in the absence of definitive treatment or assist reproductive decision making. The subject of Genetic screening like all obstacles faced by man must also be faced with a positive attitude to what is good for the future of mankind. How will we go about it, what will occur when it is implemented. How will, it be implemented. Who will be responsible? Will genetic screening allow an infusion of new DNA being injected to make some one more compatible with the future? Will the transfusion be in the format of Biochemical and medical nanotechnology injected into us? Who knows how this will come about? Or that they may be placed in an organisation that can utilise their diminishing skills and mental powers. There will be no room for faults, no room for errors and/or invalids according to the "film Gattaca" [4A1], and one where perfection will be on everybody's lips. There will be no need for genetic resumes as the resume will already imprinted within the body including qualifications gained and will continue to monitor any new skills and qualifications by the use of embedded genetic nanotechnology.

Let us now return to the basics of our main discussion and reconsider what we are faced with. Will it be illegal to discriminate, how will genetic screening become part of the normal interview job process, will it be conducted by examining our genetic makeup in our cell structure, or by saliva, urine samples, Dandruff, skin, eyes, blood, and will employers have the facilities and authority to inject a new genetic makeup into our bodies. Can it be possible to bypass genetic screening without harming the human body and at the same time the stringent genetic codes that may govern a particular industry? All this in the aid of looking into the future to see whether the genetic makeup will be compatible in that industry.

Will the employer be part of the pack that is the so called elite class or will he be someone who was able to work his way up the genetic class ladder. An interesting thought. Maybe employers become the middle person who is merely a director under the auspices of a superior controller who dictates the genetic makeup of industries and jobs. There are many articles and research papers on genetically modified food and genetic modifications regarding the future of jobs. Resumes are designed to attract the employer's attention by demonstrating and highlighting the best attributes of an individual seeking work. The interview process comes later.

Genetic Screening Issues. Genetic screening in this format should therefore not be allowed to influence the decision makers towards making an informed decision on the hiring of staff in a particular industry. Legal considerations have the potential to be both of a positive and negative nature. On one hand it is no use applying genetic screening for someone who wants to become a landscape gardener and then not apply genetic screening to airline pilots. Legislation is to be fair and equitable including applying the laws of commonsense and impartiality. The health status, qualifications and where it applies to genetic screening should only apply to the industries as previously indicated that attract some measure of risk, danger to humans, the and the environment and particular industry.

This one of many reasons why it is essential that a balance solution is found to genetic rights and that of genetic screening. Let us step back in time for a moment and review the impact of genetically modified food on society. This will give a glimpse of how society may behave towards compulsory genetic screening. GM foods have already caused a storm throughout the world and before we move on one must be clear in what genetically modified organisms (GMO) are. "Genetic modification (GM) is the term given to deliberate manipulation of the genetic material (DNA or RNA) of organisms in a way that does not occur in nature". [1] There are many who oppose it, whether it is for the right reasons or not it is not within the scope of this document to discuss the positive and negative aspects of genetically modified foods other than to say that in the third world countries it has staved off hunger and saved millions.

Do not laugh at my statement as it is already happening in the vegetable and animal kingdom where "the aim of GM is to introduce new or altered characteristics into plants, animals or, most commonly, micro-organisms (bacteria, viruses and fungi)". These modified attributes can be transferred subsequently between cells or organisms. [1] If this is the case in the plant and animal kingdom then it's only a small leap forward to the next step concerning humans. In Victoria alone during the Liberal Kennett government there was talk that doctors would be forced to make decisions on whom to treat and who not to treat based on the age and the injury of a person?

Monitoring Aspects. In the brave new world of Palmer, Cox and Brown; "occupational physicians have an important role to play in making longer working lifetimes possible, productive and pleasant" [10]. If this is what a glimpse of the future will be like, then what happens to those who are rejected, will they have jobs to go to, how will they eke out an existence, will they be a burden on society, will they be isolated and made outcasts if this happens are we then responsible for creating a sub class of humans that are considered to be unclean and to be avoided as lepers, Is this the world that we want to live in? Is the onus on the individual if subsequently injured in the workplace or displays behaviour that is unacceptable and should have been disclosed? Which brings us back the defence of the worker where Jacobs believes that "ideally knowledge of genetic characteristics should help people make informed choices regarding their own future and not result in social exclusion" [17].

Insurance Companies. Insurance companies will have amalgamated with other organisations such as banks and maybe even local authorities or even governments which will then give them greater authority over the individual. They will force organisations and workplaces to implement genetic screening and insist on a nation if not worldwide job description data base based on genetic attributes for each job. They will insist on laws regulating for and against those who fail to follow the new genetic laws and will expect law enforcement agencies to ensure that the new genetic laws are enforced.

Career Advisers. Take for example the careers advisers at the university level. They are expected to create a career path for the graduates, under graduates and the higher forms of qualifications for their candidates. Yes it is true that some universities have databases that individualise all of the job descriptions, while the government on the other had relies on its OZJAC which is a universal data base that houses all of the job descriptions and then attempts to match a personas profile and qualification into the selected criteria. I wonder then, whether in the future it will still be illegal to discriminate on age, gender, race, colour, and will dispensation be given to high industries such as the military mining, and construction.

ANNEX H

AKNOWLEDGEMENT

A Direction in Genetics - Proposal Notes by David Goddard. *I acknowledge and thank David Goddard for showing a novice like myself the wonders of the Chemical and Biological world. Furthermore, the following notes were provided by David, currently a lecturer at Monash University; kindly provided with the direction to stabilising my opinions and thoughts for this subject.*

- *What is genetic screening?*
- *What is its purpose? (i.e. what sort of answers do we want and what does it give?)*
- *Does it achieve its purposes (i.e. does it tell us what we want to know?)*
- *For that matter, how do you assess the value of any screening test -genetic or otherwise?*
- *Is it reliable? (i.e. if repeated, or done by a different lab, will it give approx. the same answer as the first test?*
- *What are the social implications - you speak of these. You want ascendancy of individual rights over those of our institutions, but what rights should institutions have. Rights are seldom absolute because ethics quite often compete, e.g. one person's right to a job may endanger the lives of others.*
- *Privacy of genetic information - who owns it, the individual or the family?*
- *If a nasty gene is found in one family member, should a sibling be alerted to it?*
- *Future workplaces - what will they be like - probably far fewer nasty exposures.*
- *Will the sort of qualities that make for a good worker in tomorrow's workplaces be well-revealed by genetic tests, e.g. does a genetic test indicate qualities such as kindness, optimism, loyalty, tolerance, honesty as distinct from self-absorption, impulsiveness, sociopathy, passive-aggressiveness, substance abuse with violence. Are there better*
  tests of this?
- *Could gene therapy overcome some genetic deficiencies?*