

THE AUSTRALIAN ACADEMY OF FORENSIC SCIENCES

PLENARY SCIENTIFIC SESSION DINNER

14 FEBRUARY 1990

SEBEL TOWNHOUSE, SYDNEY

CHAOS AND THE RATIONAL MIND

THE AUSTRALIAN ACADEMY OF FORENSIC SCIENCES

PLENARY SCIENTIFIC SESSION DINNER

WEDNESDAY 14 FEBRUARY 1990, SYDNEY\*

CHAOS AND THE RATIONAL MIND

The Hon Justice Michael Kirby CMG\*\*

VALENTINE'S DAY

We meet on this convivial occasion on 14 February 1990. This is a famous day. It is the day in 1779 that Captain Cook was stabbed to death by natives in the Sandwich Islands. On this day in 1797 the great naval battle of St Vincent took place off the coast of Portugal. The British fleet there began the long task that ultimately sealed the fate of the continental dictator Napoleon. This is the day on which Oregon and later Arizona entered the Union of the United States. We meet together in the continuity of history.

But the reason that this day is most often celebrated is that it is St Valentine's Day. Those of you who looked at this morning's newspaper will have seen page after page of loving, amusing, sad and even heart-rending messages of fulfilled, remembered and frustrated love. I poured over these messages for default of a large number of Valentine cards of my own. There was a time when I received them. But

not now. Come back with me in the recesses of your mind to the days of first love, of Valentine's joys. In the chaos of human life and of human emotions, the golden thread of love runs through our recollections and gives meaning to our lives.

Why is Valentine's Day such a festival? I did some research on St Valentine, for nothing less would be fitting for this audience. Surprisingly enough, I found that there were two Saints Valentine. Each of them suffered martyrdom in ancient Rome. One of them was said to have been put to death by Claudius. We probably saw him, hovering in the crowd as a bit-part actor in the television spectacular "I, Claudius". Researchers propound the view that the two Saints Valentine are probably the same person - a sort of schizophrenic product of historical chaos.

But why should their sad martyrdom be an occasion of joy for lovers? Again it is necessary to go back to ancient Rome. For this day is the eve of the Lupercalian Feast. You will remember in Julius Caesar the way Mark Anthony played, after Caesar's death, on the passions of the sweating, angry crowd. When Rome was then in chaos, Anthony reminded his fellow Romans that on the Feast of Lupercal he had thrice presented Caesar with a kingly crown, which he had thrice refused. Was this ambition?, the anguished Anthony demanded.

The Lupercal was a festival of the Romans then - perhaps it is still today. It marked the end of the cold winter - with the snow flakes replicating their fractel

messages. It marked the beginning of spring. The renewal of time. The orderly transition to a new season. This was a time of love. So on this day, we recall the stabilising, yet unstable, force of love amidst the chaos of the world:

"Yet, in these thoughts, myself almost despising  
Happily I think on thee - and then my state  
(Like to the lark at break of day arising  
From sullen earth)  
Sings hymns at heaven's gate  
For thy sweet love remember'd, such wealth brings  
But then I scorn to change my state with kings."

### CHAOS OLD AND NEW

Chaos is everywhere in the ancient writings that are the treasurehouse of our civilisation. In the first book of Genesis it says that when God set about creating the heavens and the earth" the earth was in a state of chaos; and darkness was upon the face of the deep. Yet the Spirit of God was flying over the face of the waters. It was then that God said "Let there be light!". And, as we know, there was light. But the darkness of chaos pre-existed it.

It was Heraclites who, in ancient Greece, propounded the contrast between chaos and human order. According to him, it was the mind of human beings that searched for logos - reason - to cast chaos aside and to bring humanity into tempered and civilised harmony.

In later times, with the Christian religion, came the notion that chaos was the residence of Satan. Mention has been made of the poems of Milton to contrast the chaos of orthodox writing and the chaos to which mathematicians and

scientists now refer. But how many of you recall the marvellous description by Milton of the chaos in which Satan lived? For most of us, it is years since we dipped into Book II of "Paradise Lost". This was Milton's description of Satan's home:

"... Earth is but a shadow  
Bordering on light; when straight behold the  
throne  
Of Chaos, and his dark pavilion spread  
Wide on the wasteful deep; with him enthroned  
Sat sable-vested Night, eldest of things,  
The consort of his reign; and by them stood  
... The dreaded name  
Of Demogorgon; Rumour next and Chance  
And Tumult and Confusion all embroiled;  
And Discord with a thousand various mouths.  
To whom Satan turning boldly, thus.  
... Ye powers  
And spirits of this nethermost abyss,  
Chaos and Ancient Night, I come no spy, I seek  
What readiest path leads where your gloomy bound  
Confine with heaven..."

So there was the very definition of Hell as seen by earthlings. Darkness and Night. Tumult and Confusion. Discord and Chance. Rumour and Chaos. A nethermost abyss. The very antithesis of what we, as human beings, thirst for and seek: an explanation. A rational cause. An ordered pattern. An understandable reason for this existence.

But now the mathematicians and scientists, in the form of Professors May and Brown tell us that the Newtonian age of reason is at an end. Our Secretary-General (Dr O R Schmalzbach) with his usual directness announced to the scientific meeting that he could not understand 75% of what Professors May and Brown said about modern chaos theory.

When I remarked on his candour to one of the distinguished members of the Academy his response was: "That was not candour. He was boasting." The simplest rules that we can see may, on closer examination, succumb to the mysterious chaotic world of our wildest imaginings. We may find that what seems orderly is in fact random. We look and look at the closer picture of reality. We find fractal figures. How beautiful are the computer patterns drawn in some unexplained way, from the linkage of mathematical equations and computer facilities. Is it not amazing that the computer - this contemporary extension of the wild mind and imaginings of humanity - can create instant art? A press of a machine. The invocation of a software programme. And pictures emerge that challenge the illumination of our minds. A simple machine can do, in an instant, what Walt Disney's staff of hundreds, with their countless pots of paint, would take weeks to accomplish. Yet the idea behind the machinery was the idea of a human imagination.

It seems that a realisation of the fractured patterns of reality arose, in part, out of a reflection upon the unconventional movements of the moon Hyperion, as it circles Jupiter. Its lack of stable rhythm defies immediate understanding. Yet a rhythm there must be or Hyperion would have pulled away from Jupiter long since. It is said to learn of these struggles of Hyperion. Before I heard of them, Hyperion for me conjured up a line in Hamlet.

As many of the scientific programmes of this Academy

demonstrate, we live in amazing times. At the one moment of history three remarkable scientific developments have coincided. Computers. Biotechnology. Nuclear fission. Some scientists who know trace the three of them back to the work of a single scientist - Erwin Schrödinger in Germany in the 1920s. It would be surprising indeed if they were not in some way linked together. But is the search for a linkage itself a search for a rational pattern? Should we continue that search? Or should we simply accept that patterns and inter-connections exist which may be quite beyond our comprehension. The effort to find a pattern in weather forecasting took the experts to feed into the computer more and more data. Yet still the data came. And the patterns, with their enormous range of variables, remain beyond our present capacity of prediction.

#### AN AGE OF CHOAS

So these are the questions that are posed for us by the age of chaos. Is there a pattern and are there inter-connections or is that the vain hope of our feeble humanity? Do we erroneously seek to impose order on the disordered world? Is it just that we cannot see the patterns, though they exist? This last question is the one posed by Professor May's inspiring address. At the end of it he seemed to suggest that, in some ways, we may indeed find patterns within the complex chaos if we can distinguish the random factors and if we have enough data and enough time and enough determination.

Take the environment, such an important issue in the world today. There was a time, not so long ago, when a factory belching out smoke was a symbol of progress. Yet, as we now know, it was dangerous to the common world. The growth in a recognition of this is not a change of reality. It is simply that we, the observers, now have more data. We have had more time. We can see the patterns coming and going. We can see the impact of the smoke. We see more clearly.

Take also AIDS - the first area in which I was associated with Professor May. With his colleague, Professor Roy Anderson, he has produced mathematical models of the likely patterns of this terrible epidemic. The models provide variables. The variables, in turn, depend on further assumptions. Somebody must do the mathematics. Someone must extend the possibilities. Someone must help predict the possible patterns of the future. In the smallest African village, a young villager wasting away with the "slim disease" is a statistic that must ultimately be reflected in the computer predictions of May and Anderson. Necessarily, we do not have all the data. Yet unless we can impose some order on the chaos of individual cases, we may insufficiently protect ourselves against the dangers of this epidemic. Realising its terrifying potentialities, we may, in time, take proper steps to protect ourselves and the generations yet to come.

And if we turn to the political world, what chaos is



there? Within the last days there has been a kind of chaos in Israel - a land no stranger to it. Yet out of that chaos and the resignation of Mr Sharon, may grow patterns of order for the reconciliation of the Jewish and the Arab peoples in those ancient lands.

This very week we have seen the release of the South African nationalist Nelson Mandela. Twenty-seven years in a prison in South Africa. Just imagine the loss of such a segment of a precious human life. And did he emerge a broken and dispirited man? Not at all. He emerged triumphant in the confidence of a large human spirit: an inspiration not only to Black people but to all people. We cannot now predict what will happen in South Africa. But a future historian will see the events of recent days in their context of the ultimate liberation of that country to a multicultural democracy.

Most vivid of all have been the disordered developments in the Soviet Union and Eastern Europe. Who could have predicted the chaos and change that has occurred there in recent days? Yet in retrospect it too may be seen as part of a wholly predictable and rational swing of the graphs of history. Perhaps communism was simply the latest version of a religious fervour which grew, peaked and then declined.

The Soviet Union faces a mighty crisis. On our television screens we see its President, Mr Gorbachev appealing to reason. He is the archetypal 20th century rational man. He debates. He points to the advantages of

his multi-national federation. He appeals for participation of his fellow citizens in the political debate. His call is always to reason. His call goes beyond his own country and it reaches our ears. Yet in the shops of his fellow citizens, the shelves are empty. In their hearts, the appeal of nationalism is still strident. Indeed, it may overwhelm the call to reason. Political chaos may yet reign. The union may disintegrate. Nationalities may revert to their ancient rivalries. Reason may, for a time at least, be insufficient.

So these are the great changes of our time. We cannot see where they will go. We can only guess at the movements which they illustrate. But that does not mean that there are no nuts or that there is no pattern. Perhaps, in St Paul's words, we see "through a glass darkly". But the time may come when we will see "face to face". We need more than the gift of prophecy. We need science, human imagination, data and the rational human mind.

#### THINGS FALL APART

Around this room, and in this Academy, we see the disciplines of a civilized order. Dr Kevin Bleasel, our Past President, lately honoured by the Queen as an Officer of the Order of Australia, every day opens the human cavities in neurosurgery. Within he finds a kind of chaos. Yet with his surgeon's knife he seeks to impose rational order upon the maladies there discovered. Mr Ian Temby QC and the Hon Adrian Roden in their inquiries open up the chaos of a modern

society. They examine the body politic. They expose its corruptive ailments and direct the point where social surgery is needed. The judges and lawyers here in such numbers see the chaos of ordinary human lives revealed in brief evidence in their courtrooms. They seek to impose rational rules upon irrational human behaviour. They do so in the name of society, lest social chaos reign.

Our Academy is indeed, as it was described, a kind of 19th century relic. It is indeed a monument to the dedication of educated people to the notion that problems can be tackled by debate, discussion and reflection. That is why we come together. We could, of course, accept chaos. But we do not. In our lives we search out for order and for solutions.

William Butler Yeats, whose powerful imagery, 50 years after his death, is increasingly forcing itself into the modern imagination put it well:

"Turning and turning in the widening gyre  
The falcon cannot hear the falconer;  
Things fall apart; the centre cannot hold;  
Mere anarchy is loosed upon the world  
The blood-dimmed tide is loosed, and everywhere  
The ceremony of innocence is drowned;  
The best lack all conviction, whilst the worst  
Are full of passionate intensity."

But Yeats is not content to leave it there - the world falling part, the centre unable to hold. It is in the nature of the human condition he describes to search for solutions to such terrible problems. Yeats suggests it may be found in a Second Coming after twenty centuries of "stony sleep".

"Surely some revelation is at hand;  
Surely the Second Coming is at hand."

The words of Yeats' poetry is like the vivid imagery of the fractals. Those images like the notes of music, the beauty of a snowflake and the miracles worked on the mind by reverie have no reality, save for their impact on the human intellect. That is why a rational Academy like ours still has a place in the world. Perhaps in a time of chaos its importance is even enhanced.

\* Speech delivered at a meeting of the Academy offering the vote of thanks to the speakers, Professor Robert M May, the Royal Society Professor of Zoology, University of Oxford, England and Professor Gavin Brown, Dean of the Faculty of Science at the University of New South Wales.

\*\* Immediate Past President of the Academy. President of the Court of Appeal of New South Wales. Commissioner of the International Commission of Jurists and of the World Health Organisation Global Commission on AIDS.