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Beneficent Providence and the Quest for Harmony: The Cultural Setting for Colonial Science in Sydney, 1850-1890

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The true notion of Providence is, that it uses moral beings, everywhere throughout its immeasurable realms, as its own instruments for the completion of its grand designs in ultimate futurity, without rendering those beings the less moral and accountable. And it is but consistent with the notion of a Providence so perfect and so absolute, that its designs should be at once beneficent and just. And thence must be inferred, in the words of Pope, considering everything in the light of an instrumentality in a supreme hand, that “whatever is, is best”, yet so as that it shall not be best for the perpetrator, and within the contracted circle of his immediate connections, unless it be morally good and right.^[1]

The sentences quoted above come from an editorial of the *Empire* newspaper published in 1855 and entitled “How the World is Really Governed”. This article (and it was not unusual for that time as clergymen were newspaper editors or leader writers) was a form of “secular sermon” preached at the readers, but it also provides a fair summary of the fundamental values and beliefs prevailing among the articulate and the educated in Sydney during the middle years of the nineteenth century.

It was these men who were actively involved in giving lectures at the Sydney School of Arts, the Philosophical Society and later the Royal Society of New South Wales, who contributed articles and letters to the newspapers and journals of Sydney both on questions of immediate concern and matters of general interest, who created the “intellectual climate” of Sydney during this period. They were clergymen, lawyers, professional men – invariably good, solid respectable members of the community. What the inarticulate, the labourers, farm workers and the like thought on such matters we will never know for such people rarely leave behind a record of their opinions – although the writings of the poet Charles Harpur, who was very much a man of the people, indicate that he shared many of the values of his more middle class compatriots. In any case it was these active, articulate members of the middle class who, through their speeches and writings, set the agenda for the way in which political, social, moral and even scientific issues were discussed during these years. When we speak of colonial culture, it is largely the culture of these men to which we are referring; but I believe it is fair to say that an accurate picture of their “mental furniture” can be extracted from their writings, a picture which provides us with a fairly good idea of the place of science in the culture of colonial Sydney.

It is a truism to say that what we call science or scientific activity does not operate in a vacuum but is part of the more general complex of values operating in a society. If possible, this was even more the case in the nineteenth century. Ours is the age of specialization and of the professional scholar this is the case in the humanities as much as in the sciences. But there were virtually no professional scientists in mid nineteenth century Sydney, only people interested in “natural philosophy” enthusiasts rather than people seeking to climb “the greasy pole” of academic life. Such people had no vested interest in becoming “experts”; indeed there was a suspicion of specialization. This was a time when the interrelatedness of all knowledge was emphasized, a belief expressed by John Woolley, first Principal of Sydney University, when he described the way in which Niebuhr, the philologist, had been forced to pursue his studies into philosophy, ethnography, social science and medicine.[2]

Natural philosophy or science was considered to be an activity related to all the other activities of the human mind in many ways it had not yet fully established its independence and autonomy from these activities. There is much to be gained for an understanding of colonial science from an analysis of the age, from an exploration of the categories that were used to interpret the world and man’s place in it.

With the development of railways, the telegraph, photography this was indeed a time of great prestige for science but it was also an age which placed its faith in the values of progress, free trade, selfculture, improvement and the triumph of civilization. As one colonial writer put it:

commercial enterprise has a direct tendency to promote science, literature and the arts; it is only when these are united that the one is dignified and the other useful, and that this union has a beneficial influence on human happiness and the peace of mankind. [3]

Science was but one element, albeit a very important element, in the ultimate victory of humanity.

So what we must imagine is a picture with the Statue of Science standing in the foreground; next we sketch in the surrounding Gods and Goddesses of the Pantheon and with a few quick sweeps of the brush the grove in which they are standing. Hopefully we can achieve the necessary perspective and proportion between the elements of the painting, or, more prosaically, a sense of context.

Beneficent Providence, the belief that God was directing the world and mankind along a pre-ordained path towards a better future, and Harmony the ultimate goal of that endeavour together encapsulate the view of the world held by many of the educated and articulate in mid nineteenth century Sydney. It was a view of the world which emphasized “progress” and change but it is important to see that it held out the promise of ultimate stability. Change was not aimless and purposeless; mankind was not the victim of an all-conquering Fortuna which rolled on until eternity with no apparent rhyme or reason.

Men are frightened of change; it disturbs the equilibrium of their values, it disorients them – it creates that state of insecurity which the sociologist Emile Durkheim called anomie: a psychological condition which can afflict the successful as much as the failed. Peter Gay has drawn our attention to the fact that “innovation” was for a long time a ditty word;[4] preservation not creation was considered to be the supreme virtue. Even the French Revolutionaries who so completely upturned the established order were seeking not so much to destroy as to restore their society to its true principles.

The nineteenth century was not merely an era of great change but it was perhaps the first time in human history that men accepted the legitimacy of change. But at the same time they had to take the sting out of the tail of innovation and render it sensible and orderly. This was an especial need in a new and fluid society like New South Wales which had been created by migration and which in the early 1850s still bore the stigma of its convict past. It was a society renowned for its sinfulness although this can be explained partially by the fact that clergymen, through their involvement in its intellectual life, helped to “manufacture” this image; then in the early 1850s it was a community turned upside down by the goldrushes. This was a society both in turmoil and perceived to be in turmoil; in the leading articles of the newspapers of that period there can be found many references to the supposed high incidence of drunkenness, suicide and mental illness in the colony.[5]

When the colonial thinkers came to discuss and write about progress and Providence it was not just a matter of explaining change, it was also a question of managing it, of demonstrating that change, rebaptised as progress, meant order and the promise of stability. They took the erratic gyrations of change and turned them into the well modulated rhythms of progress.

There was nothing to be afraid of; Providence was acting for the benefit of mankind and moving towards a harmonious unified world bound together by the free operation of God’s laws. The whole operation was proceeding according to the natural laws established by God and knowable by man through the exercise of his divine faculty of Reason. Man could consequently participate in realising the aims of Providence and God or he could hinder it and disobey God’s laws (and suffer the consequences).

The position is best summed up in the concluding sentences of John West’s *History of Tasmania*:

The happiness and prosperity of the people is by Divine Providence placed within their power. If they grasp at wealth to the neglect of their social and political duties; if, for the sake of selfish ease, they resign to ignorant and violent men the business of legislation; if they tolerate systematic debauchery, gambling and sharpening; if they countenance the press when sporting with religion, or rendering private reputation worthless; if they neglect the education of the rising generation, and the instruction of the working classes; if the rich attempt to secure the privileges of rank by restricting the franchises of the less powerful; if worldly pleasure invade the seasons of devotion; and the worship of God be neglected by the masses of the people, – then will they become unfit for liberty; base and sensual, they will be loathed and despised; the moral Governor of the world will assert his sovereignty, and will visit a worthless and ungrateful race with the yoke of bondage, the scourge of anarchy, or the besom of destruction.[6]

In summary, the belief in a beneficent Providence achieved the following aims:

- i. It rendered change orderly and understandable, thereby removing its threatening character.
- ii. It allowed the colonial educated classes to believe that they, living in a tainted, insignificant colony at the end of the world, had an important role to play in the progress of humanity.

In this context science is not revolutionary force leading the assault on the bastions of Absolutism and Reaction. Henry Parkes once suggested that in the colony democracy was the true conservative political principle.[7] In a sense this is also true of Science; it was conceived to be a force for stability which would establish the permanent laws through which man comprehends God. This sentiment is summed up in a leader from the *Empire*, which claimed that

the resources of the Land could only be developed by a “thorough acquaintance with those great truths of Science which are the Laws of the Creator, and a knowledge of which serves at once to preserve from superstition, and to form the solid basis of true religion.”^[8]

Now I want to devote the rest of this paper to examining the roots of these values more closely and to uncovering the religious and metaphysical - perhaps one could go as far as to say the ideological outlook which underlay them. I propose to do this under three headings:

- i. Natural Religion: the idea that God rules His universe through laws which can be known by human reason.
- ii. Beneficent Providence: the idea of a progressive world moving towards a pre-ordained goal.
- iii. Ultimate Harmony: the optimistic belief that the goal of history is a sort of Platonic universe from which conflict has been banished. In fact this can be seen as an attempt to translate neo-Platonism into historical terms.^[9]

Natural religion is founded on the belief that God’s existence and presence in the world can be demonstrated by looking at the way in which the natural world is ordered and structured. It rests on the argument from design which claims that such a well constructed machine as the Universe must have a builder and designer.

This belief in “Nature’s God” was common amongst the educated in the colony, and was extended to include the idea that the Universe was an interconnected whole held together by God’s laws. Firstly, I would like to examine two relatively formal expressions of this idea, the first originally from 1851, the second from 1881.

Barzillai Quaipe produced the only substantial work of philosophy written in the Australian colonies before 1880; published in 1872 this work entitled *The Intellectual Sciences* was based on lectures he had given at the Australian College in 1851. In it he developed the idea that the universe is a harmonious unity which derives its existence from God’s Reason.

“The Universe is one. Its author is one. His government is one”^[9] – so proclaimed Quaipe. Man can know and understand the universe because God’s Reason, man’s reason and the structure of the universe necessarily coincide. Every part of creation has laws suitable for its mode of existence and three departments of laws rule the universe – Physical, Intellectual and Moral, all of which find their ultimate causality in Reason Absolute. Organic and inorganic matter is governed by “the operation of laws containing a mechanical causality.”^[10] Mind equally receives its arrangement from the hand of the Creator and, although it is as objective as matter, it contains a subjectivity; possessing Reason it also exhibits subjectively the law of causality. Thought, the product of Mind, is made possible by the laws of Mind and so a Mind free of morbid despositions collects and arranges ideas under the laws of Reason.

This road from physical laws to intellectual laws finds its ultimate goal in God’s moral laws, made “by God for mankind and ... drawn out of the very nature of man.”^[11] Man’s obedience to these moral laws constitutes his true nature just as obedience to the physical and intellectual laws of the universe is the road to knowledge and Truth.

In an article entitled “Biological Science” in the *Sydney University Review* of 1881, Professor Stephens elaborated his vision of the hierarchy of knowledge. Man, Stephens claimed, had a threefold nature – animal, moral and intellectual – and the elevation of mankind, which he

viewed as the aim of education, requires the “simultaneous cultivation of all these in true harmony and just proportion.”[\[12\]](#)

The University should contain a threefold division of labour to maintain this harmonious balance: Humanities to inculcate moral and religious truths, beauty and goodness; Physical sciences which provide the basis for the material advancement of society and the biological sciences dealing with the structure and functions of organised existence. “All three trunks are equally essential” claimed Stephens but the “Sovereign is philosophy; the sciences are her administrators.”[\[13\]](#) Moving forward together, “living Philosophy and living Science” will provide the defences that demonstrate the necessity of pure Religion.

Stephens’ attitude is somewhat different to that of Quaife and yet he shares with him a number of similar concerns: the unity of knowledge, the primacy of the moral over the physical, the desire to use science as a buttress for religious belief. They both have a hierarchical conception of knowledge, a vision of a well-ordered universe created by God and knowable by man, through Reason.

Most of the educated men of that age shared this belief that the universe was an ordered, rational whole or as Charles Harpur put it “a symbolization, or language of the Divine Mind.”[\[14\]](#) Hence William Woolls could claim that every vegetable has its uses; “The Divine Architect made nothing in vain.” The progress of science, he argued, “gives daily increasing proofs of the power, wisdom, skill, and goodness of the First Great Cause of Things.”[\[15\]](#)

Even in discussing such an apparently prosaic matter as “Sanitary Reform”, Isaac Aarons could refer to “The Power that has, in so wonderful a manner, adapted everything in creation to its allotted purpose, has ordained that in accordance with the organic laws of animal existence, the atmosphere we breathe shall be composed of such materials and in such proportions as best fit it for sustaining life.”[\[16\]](#)

But this was not just an intellectual matter; Natural Religion was not founded solely on the rather bloodless picture of the Universe as a cold and mechanistic entity constructed out of a series of abstract laws. “All nature proclaims the knowledge, the wisdom of the Creator”[\[17\]](#) claimed one writer. For him and most of his compatriots Nature was a source of marvel, of wonder which man could learn to appreciate aesthetically, religiously and emotionally as well as intellectually. These writers did not separate out the cognitive aspect of the human personality as being alone capable of knowledge; knowing and feeling were but two aspects of the total response of an individual to the world. Nature was the model of the Good and the Beautiful as well as the True.

Nature was the source of morality; external influences “drawn from the book of nature,” commented one writer, were used by the “Great Author to expand the infant intellect and inculcate through observation of his creatures many of the social virtues which make man useful to man.”[\[18\]](#)

From God the beauty of the Universe equally was derived, and within Nature there could be found models of symmetry and elegance towards which Art, the product of man strove in its attempts to imitate God’s original model. As John Woolley aptly summed up: “The Perfection of Art, is to approach, however distantly, to the simplicity and ease of Nature.”[\[19\]](#)

This Nature then was Nature of Priestley onto which had been grafted the Nature of Wordsworth; a machine run by laws according to its Creator’s specifications but also a source of spiritual strength and joy to which an individual could retire for spiritual renewal.

Now nourishing is Nature to the soul
That loves her well! not only as she acts
In constant contact with its quickened powers,
But as she tempers all its after-moods
Through distant memories and remotest tokens.
And hence, when thus beloved, not only here
By the great Sea, or amid forests wild,
Or pastures luminous with lakes, is she
A genial Ministress; – but everywhere![\[20\]](#)

Nature, was a harmonious whole to which man could go for knowledge, for spiritual renewal, for artistic inspiration, for the rules of morality and social life. Nature was a guide for every aspect of human existence. The way to Perfection lay in living in accordance with the laws she had laid down.

Just as God established the laws of physics and chemistry so had he laid down the laws of economics and society. In the economic realm, as in the physical world God had done his job well and the economic sphere of Nature ran like a well oiled machine. The elements of the mechanism, that is to say the various economic interests of society, did not conflict and bring about inefficiencies, but were complementary; and so long as men allowed them to operate freely and unhindered they would ensure a prosperous and stable society. For example, it was argued that the interests of town and country were identical because they depended on each other for prosperity and hence both were necessary for the completion of the economic and political system.[\[21\]](#) The same was held to be true for the interests of Capital and Labour; socialism was castigated as the creed of selfish mammonists.[\[22\]](#)

In the international context this conception of economic laws gave rise to the doctrine of Free Trade. Put crudely this creed claimed that every country and part of the earth produced goods or resources of which other parts of the world had a need. The free inter-change of these goods and resources would result in mankind being peacefully entangled in a giant web of commerce; war would no longer be desirable or possible; mankind would be bound together in a Brotherhood of Humanity. The triumph of free trade principles was also associated with the diffusion of knowledge and the spreading of “civilization” into the four corners of the Earth:

For I am Herald of the Dawn
Of civilization! - Closer drawn
Within my world encircling link
No more can nations ignorant shrink
From out one common brotherhood
Nor deem each other's ill their good.[\[23\]](#)

Economic protection was immoral; a form of stupidity, idleness and robbery. The compact of all mankind was commended by Nature. The “natural faculties of man and the advantages of the country in which he lives, can only be properly utilized when he is free to trade where he likes without obstruction.[\[24\]](#) Free trade was as much a metaphysical as an economic doctrine; the laws of Nature ultimately were moral laws to support those laws was to do God's will.

Australian democracy could also be viewed as the fulfilment of the laws of nature. Here was a society freed from all the unequal divisions of Europe, a society which could allow the full growth and development of Nature's system of morals, politics and economics, “of simpler and

more rational forms of government, as well as a higher state of individual freedom, independence and character.”[25]

In this democracy without classes there was no need for parties – progress could indeed be measured by the rate at which the individual came to supersede classes or groups.[26] Replacing “parties” would be a group of right-thinking men, their principles formed in accordance with the Laws of nature and between whom consequently there could be no fundamental difference in outlook.

Representative government was a mechanism which allowed free citizens, their views unclouded by class prejudice, to elect these virtuous, intelligent “natural aristocrats” who would then rule in the interest of the whole community. John Dunmore Lang even used a scientific analogy to describe this process. Colonial society, he wrote, was like a collection of chemical salts thrown into a common solvent and once the water cooled a new form of crystallization would occur in which Nature’s aristocracy would rise to the surface.[27]

Nature was the one reliable guide for mankind in every aspect of its existence – material, economic, social, ethical, political. Amidst all the change and upheavals of the age Nature remained solid and objective, a firm set of principles and rules which could be known by any right thinking individual using his faculty of Reason.

At the moment the Laws of Nature were not being allowed to operate freely – indeed England was suffering the consequences of willfully disobeying these laws[28] – but the world was moving towards an era in which they would guide the actions of all mankind. A Beneficent Providence was leading humanity out of darkness and into the light the present period was to be viewed as a transition stage between the Age of Might of the feudal era and a coming Age of Right, of Justice and liberal principles.[29]

Beneficent Providence was a general, not a particular Providence. It was not the unpredictable intervention of a God whose ways were beyond man’s comprehension seeking to punish man for his sins and bring him back to the true and narrow. It was instead a general plan laid down by a God who had man’s best interests at heart and who acted rationally through laws knowable by man through Reason. For example, in 1857 there were some fears that a comet would crash into the earth and possibly destroy it. God would not allow the world to be destroyed, announced the *Sydney Morning Herald*, it was not in His nature to destroy His handiwork through one chance act.[30] No, Beneficent Providence would ensure that God’s plans for men, the scheme of History would be fulfilled:

Each man’s Life history is that of all the world
From that which earthly is, the Spirit is unfurled
The world is growing up from childhood unto man
All history has thus, though dark, a might plan [31]

Few, perhaps, would have agreed with Charles Harpur when he wrote that the physical universe, under God’s direction, was moving towards perfection “to instance the fact by the way, when the orbit of our Earth, now an ellipse, shall have been a circle, towards which it obviously tending be thereby perfected in perpetuity,”[32] but they would have concurred in his belief in “the ultimately perfect plan” of Providential Design.[33]

The triumph of Providence would bring about the final establishment of the Laws of Nature in the Universe – it would abolish the distinction between ‘is’ and ‘ought’. As God intended that

there should be free intercourse between the nations of the world. Free Trade was both a statement of an economic law and a moral imperative. As John West summed it up “the mutual dependence of nations is the result of design, not accident. It is the decree of Providence as well as of nature.”[34]

Indeed the whole colonial endeavour could be justified in terms of following the will of God as expressed in His Providential Design. Colonization “the possession of the uncivilized world by civilized man” was not as we may believe today, a means to the “aggrandizement” of these men but something far nobler – “a working out of the dispensations of Providence.[35] Not personal avarice and greed but the necessity of carrying out God’s impersonal plan is what motivates colonization – it is a matter of duty, not of personal gain; so it was claimed. Colonization then was the Divine Mission of Nations[36] and its role was to ensure that the European races spread into every corner of the Earth. But this was not merely a sordid question of economics and the exploitation of material resources; it was also the means through which the light of science would be spread. Providence was spurring the Europeans on to march hand in hand carrying with them the torches of civilization and enlightenment.

Providence had given science as a gift to mankind for the purpose of “realising those benefits prepared for us by the beneficent Being, the Creator and Ruler of all.”[37] To promote science was to strengthen the hand of civilization, to enhance mankind’s intellectual capacities, to purify its moral instincts. It was to do God’s will. Some writers even went further and adopted a variety of Pelagianism science was a tool which mankind could use to attain grace and obliterate, or at least ameliorate “the punishment to which man, in the garden of Eden, was condemned for his disobedience.”[38]

The idea of Providence was a powerful tool; it explained and justified both the growing European dominance of the world during the course of the nineteenth century and the place of Australia in that victory of European civilization. Reference to it can be found scattered throughout the colonial writings of this period and although most of my examples come from the 1850s it is still possible to read in 1879 of the “part in the history of the world this young nation under Providence, is destined to play.[39] Everywhere the hand of Providence could be detected – in the Indian Mutiny of 1857, in the growth of cities; even Women’s Rights could be justified by reference to it.[41]

What then was the goal of progress and providence? As we have seen already some rather extravagant hopes were entertained. The ultimate object of nature, claimed Dr. Campbell in his “Notes on Human Biology” published in the Sydney Morning Herald, was the perfection of the species.[42] Charles Harpur expressed his Utopian vision poetically:

And in this Southern Land there yet shall be
A race begotten in the Spirit of Beauty,
Such as the olden Greeks were, limbed and shaped
By that deep ideality which works
Into the stuff of nature, and becomes
Progressively its mould; and in and through
This physical perfection manifest,
Shall burn a soul of power surpassing that
Which was in Greece only the effluence
Of an artistic, not an actual life.
But here it shall be Actual – making all
Man’s instincts with his motions modulate

Till thus perfectionised, his native growth
Shall body forth the Living Beautiful.[43]

The general tendency was to place the promise of Utopia somewhere in the dim future as Rolleston in a lecture on, of all things, Savings Banks, in 1857, demonstrated when he spoke of the “glorious destiny which, like the dim shadow of a man’s hand, can as yet but faintly be distinguished on the verge of a far horizon.”[44] Or as W.A. Duncan expressed it, “although the progress is slow we do believe that the golden era has dawned.”[45]

If progress, the realization through Beneficent Providence of the laws of nature, had a goal then that goal was Harmony – the harmony of man, nature and the universe. Then man would be restored to his pre-fallen state.

It is commonly believed today that nineteenth century liberalism stressed conflict and competition to the detriment of social cohesion and co-operation. My reading of the evidence, for colonial N.S.W. is that, at least at the level of ideas, this was not the case. The emphasis was very much on co-operation, the common interest, harmony; and as I have already suggested the source of this emphasis comes from the peculiar social circumstances of the colony and the effect of rapid change in a new society. To advocate competition would be to run the risk of social disintegration.

The goal was harmony: at an individual, at a social and at a political level. Once man discovers the theoretical harmony of God’s reason, of the laws of nature, he will be able to translate that harmony into practice. Once the individual understands the harmony of nature he can develop his personality so that its various elements attain a state of harmony and balance. God wants man to cultivate all of his faculties, to develop his powers and the individual who cultivates all of his attributes and makes them harmonize comes closest to the state God intended for him.[46] Education is the “cultivation of the entire moral and physical nature”[47]; effectively what we have here is a belief in culture, in the harmonious development of the personality as a means of perfecting it.

This desire for harmony applied to society as well as the individual. According to the laws of nature society operated harmoniously and man possessed a social sense or social sympathy which encouraged him to act in co-operation with his fellow man. There was, in this view, nothing more beautiful or holier than for an individual “in conjunction with others developing the higher faculties, and feelings, and the enjoyments of his spiritual nature.”[48]

A natural society was a harmonious society; co-operation, founded on a noble and Christian spirit was to be encouraged. No society, it was claimed, could be prosperous without the harmonious co-operation of capital and labour. Co-operation rather than the selfish class interest of communism was the true key to the workman’s paradise.[49]

The key to the creation of the ideal society lay not in the development of a rugged individualism and the competitive spirit but in the natural unfolding of man’s social sympathy:

the social compact attains its maximum of perfection where it draws out of each individual citizen the greatest amount of good that in him lies, as his share in the contribution to the general stock.[50]

As a summing up of the direction in which many believed the age to be going I would like to quote from a *Sydney Morning Herald* editorial of 1872. In the first part of the article the progress of England during the first half of the nineteenth century it described:

But a mighty change was wrought when the spell of isolation was broken by the establishment of means of transit and intercourse. Gradually the nation became an organic unity, the vital energies circulated from the great centres of social life to its remotest extremities, and all its movements were consentaneous. The intellectual light which before shone at a distance, dazzling rather than illuminating, conducted down into the mass, passes now from mind to mind, and penetrates every class of the population with some portion of its heat and radiance. The resources of the country, both moral and material, are developed; the comforts and conveniences of life increased, prejudices are unlearned, causes of separation are removed, and superstitions vanished.

The article then goes on to discuss the more general effects of these developments for the world as a whole and concludes on this rather optimistic note:

Amidst all the variety of party distinctions, however, there is much that is common to the whole human family. There is a resemblance between men's minds as there is between their bodies – a specific identity, consisting in a similarity of faculties and functions, of emotions and desires. From this affinity of our moral and intellectual nature arises the attraction which mind exercises upon mind, and which is continually drawing men into closer and more intimate communion. This gregarious principle, if not more powerful than the causes that repel men from one another, is more constant in its operation. It inheres in humanity, whilst the causes of separation are accidental and local. There is in the world a far greater number of things to unite the suffrages of men than to divide them. The vices and villainies of our nature are all anti-social. Its heroisms and great virtues are promotive of union and harmony, and flourish most where these prevail. The mind also receives its most perfect form, its highest polish and brightest lustre from contact with other minds, as the diamond receives its shape and brilliancy from kindred substances. Passing by the peculiarities of special combinations amongst men, and contemplating the whole race in co-operation, we come to the conclusion, therefore, that the fundamental and ultimate principles of our nature, which, under all circumstances, would combine their individual impulses, are such as tend to good, and that the prospect of a universal correspondence and approximation of human interest is the result to be expected from the social union of mankind. It is to the instinctive efforts to approach one another, to interchange thoughts and feelings not less than to the force of those necessities which compel them to seek interchangeable supplies, that men are indebted for most of their great achievements in science and their conquests of nature. It is this social passion that has inspired the noblest works of genius. It is this that rejoices in the peace and prosperity of nations: and it is to this that we must look for the consummation of human happiness. Implanted in our hearts, and interwoven with all our affections, it is one of the primary laws of our being, and must ultimately supervene all separating causes, which are but circumstantial and fortuitous, as the constant though inappreciable force of gravitation gradually reduces the loftiest ramparts to the dust. Already it has removed all physical and material obstructions to its full operation by inciting to the discovery of steam and electricity. The obstacles that remain are of a moral and intellectual kind, many of them irregular, and others the unnatural growth of vicious training; but they also are destined to give way before the law of approximation, to be erased and trodden down by the mighty agencies it has called into being and activity.^[59]

The faith that harmony would ultimately be achieved was a very fragile thing and could be seriously threatened by disasters in the same way as the Lisbon earthquake of 1755 had shaken a similar sort of optimism amongst the philosophers of the early eighteenth century. Society,

politics, the natural world clearly do not work in a harmonious fashion for the benefit of man – a great deal of suffering in the world is caused by the workings of Nature’s laws just as the “laws” of political economy punish the defenceless as much as those who disobey its dictates.

But empirical verification is often no real barrier to belief in such ideas; failures can always be explained away and the responsibility placed on men and circumstances rather than the validity of the intellectual framework which interprets their actions being questioned. The pattern of belief remains and it largely determines how men see their world; it sets intellectual priorities. For example most people read Rolf Boldrewood’s novels as simple romances and adventure stories. Yet his works do have an underlying “metaphysics” which is very much concerned with the workings of Beneficent Providence. Boldrewood asks is there a Beneficent Providence operating in the world. If so why is luck so important in determining the fortunes of men?[52] His interest in bushrangers was not accidental – if Nature is allowed to operate freely in Australia why then do bushrangers rise and flourish?[53] Can man and society really be perfected?

The framework froms the categories which determine what questions men will ask of their environment hence the faith in harmony remains largely unchallenged but the members of society who fail to live up to its precepts are castigated and condemned as self-interested. The goal of Harmony remains but men are seen as frustrating its achievement. This simple insight helps to explain the constant railings against the workings of political democracy in New South Wales during these years. Politicians were constantly reviled as “selfish and recklessly adventurous men”[54] driven only by love of office who had chased the high-minded men of capacity and intelligence out of public life – those men who stood for the “common good” and who were capable of producing harmony. Instead of harmony there were party struggles which impeded legislation; in the place of the striving for the Ideals of Nature were “vulgar ambitions and sordid aims”. [55]

And yet the faith remained: in a special supplement on the occasion of the Sydney Exhibition of 1879 the *Sydney Morning Herald* claimed that improvement had occurred in the colony despite “delays and obstructions, the confusion of so-called parties and the distractions of personal interest, the dearth of trained statesmen, and the eagerness of untrained men to force, themselves to the front.”[56]

Another writer expressed it this way:

However legislation may patter on in an idiotic way, the silent powers of nature and the expand-common sense of the community, carry us in a certain direction. We do not go back. [57]

What then was the implication of all this for science in Sydney during these years? I think the first, and in someways most important thing, is that these ideals reflect the values of the sort of society in which science, like literature and the arts, is still the pursuit of amateurs, of gentlemen. It is a relatively simple society; it lacks a large government bureaucracy and well developed education system the sorts of institutions which today give employment to the educated and the professional. The Law was virtually the only outlet for a young man of ability.

Science was part of the “general culture” of those in colonial society who sought to improve and educate themselves. Only slowly did Science establish itself as an autonomous entity. In the 1850s almost everyone used the words “Science” and “Art” in their pre-modern meanings – science being the theoretical and pure knowledge of an object, and art the practical application of that knowledge. Therefore “Art” was assumed to be both beautiful and useful. When Sir Thomas Mitchell spoke of “The Importance of Art and the Necessity of it in New Colonies” he

meant that science could be used in various ways to improve the colony and to reclaim lands from nature, assuming that making nature useful to man invariably meant beautifying it.[58]

An *Empire* leading article spoke of the need to promote true science and good taste as if the two things were identical. It claimed that an improvement in colonial architecture would raise both the level of knowledge and the standard of taste, and the individual should “invoke science and Art to beautify his family mansion and to plant his garden.”[59]

The journals of the age tended to include articles on science and scientific matters because they assumed that educated men were interested in such matters. Just to take two examples, both from rather late in the period – in the *Sydney University Review* of 1881-3 alongside essays on Charles Lamb, Carlyle and Cathedrals there are articles on Charles Darwin, Artesian water, Linnaeus and Technical Education.[60] The more literary *Australian* (1879-81) included a regular section on “Practical Science”, by which it meant such things as sanitation and railways.

This leads us to a more coherent understanding of colonial attitudes to science. Although, as we have already seen there was a strong tendency towards Utopianism and dreamy visions of the role of science in building the perfect society there was also an intensely practical and utilitarian streak in colonial attitudes to science as summed up in this phrase “Practical Science”. The “Introduction” to the *Sydney Magazine of Science and Art* (1857-9) stated that the British had a “passion for utility” and were more renowned for the genius of their inventors than for the glories of their literature. It went on to stress the “fresh boons” which science was conferring on mankind, and the assistance it could render the colonists in developing their continent.[61] Later articles in this journal stressed the great benefits science could confer on the community and claimed that “a man, with some scientific knowledge, in the bush, is a benefactor to his neighbours for miles around.”[62]

Many of the articles published by this journal were marked by the spirit of utility. For example in an address to the Horticultural and Agricultural Society, Sir William Denison said that there was a need for the farmer to use machinery and science to increase the return on capital he had invested in his land, a sentiment which underlay much of the interest in science in the colony.[63] Articles often discussed new practical scientific advances of the day which might be applicable to the colony in such areas as railways, sanitation and health, the local water supply, photography, irrigation and statistics: all of which were matters which would aid the “general health, welfare, happiness, longevity, and hence the general improvement and advancement of the human race.”[64]

This instrumentalist conception of science, the interest in the benefits it could provide as opposed to an interest in science as a thing in itself, as a means of attaining truth, fits in very well with a Utopian conception of the place of science in society. Both stress what science will produce rather than the value of the scientific activity itself. This instrumentalism pervaded the whole of colonial culture and is implicit in the notion of “improvement” – literature and the arts were equally studied not as ends in themselves but as means to an end: in this case the harmonic cultivation of the powers of the individual.

Another consequence of the relative undevelopment of science as an autonomous entity was the prevalence of much pseudo-science in the colony. These were the years during which first phrenology and then spiritualism became an abiding interest for many people. But there was also much interest in such things as animal magnetism and the supposed occult powers of electricity. To take but one example – in the *Sydney University Magazine* of 1855 there appeared an article entitled “Electricity and Magnetism, in Connection with the Human Frame”. It begins soberly

enough by stating that “phenomena, commonly called inexplicable, may be accounted for, and shewn to be but a newly discovered result of the universal laws of nature.”[65] It then goes on to discuss, with reference to Mesmerism, animal magnetism, electricity and the “aura” theories of Reichenbach the idea that “there seems to be a power in the will, of evolving an atmosphere from oneself, which is capable of repelling the ill effects of the diseased atmosphere emanating from a sick person” and that this power be called “contagious health”.[66] And the discussion is carried on in a serious, scientific fashion in the hope that this line of investigation will help to eradicate disease.

The final effect on the attitudes to science in Sydney during this period which comes from the stress on unity and harmony was the tendency to integrate new ideas into the existing framework and to demonstrate that all knowledge formed a coherent whole. These colonial thinkers wanted science and religion, the bible and history, evolution and creation; therefore they emphasized not the conflict of ideas but their harmonious integration into one vast system of knowledge.

As an example of this tendency I refer to an article entitled “Evolution and Faith in History” by one W. Carlile which appeared in the *Australian*. In this article Carlile argues that it is necessary to connect the Christian Spirit with Evolution because Christianity renders individuals, families, nations “more effective combatants in the struggle for existence.”[67] He believes that there is no conflict between Evolution and design and cites the English Constitution as a “great and beneficent system that is the work, at once, of Evolution and of Design.”[68] Citing as his authorities Sir Henry Maine and Bagehot, Carlile comes to the conclusion that progress is best when it grows and “evolves” slowly out of the circumstances that preceded it. “Evolution”, in this view, is not the struggle for existence but smooth harmonious development in which conflict is smoothed out and opposites reconciled.

The 1880s mark a watershed in Australian development in exactly the same way as Norman Stone has observed that they did in Europe.[69] That decade saw an intensification of those tendencies which have given the modern world its distinctive character – urbanization, secularization, nationalism, bureaucratization: in other words those developments we associate with modern industrial society. Thus in the 1880s Sydney becomes a burgeoning urban centre facing all the problems of modern metropolis; trade unionism and the issue of Labour becomes increasingly important; a new educational framework is put into place; even the sleepy old University of Sydney begins to grow and diversify.

As a new more complex society emerges so are the old verities questioned: the liberal faith is challenged by a new secular nationalism exemplified by the *Bulletin*.

The bush ethos, largely the product of alienated urban intellectuals, and stressing the virtues of rural simplicity, takes up the cudgels against “civilization” and commercial, urban values. A new class of professional writers and journalists replaces the gentlemen “litterateurs” of earlier times.[70]

The emergence of this new, professionally oriented culture meant the death-knell of the old-style gentleman scientist or writer and of his vision of a universal system of knowledge bound together by God and His Laws. In Science, as in all areas of knowledge, the day of the specialist and the academic was at hand.[71]

This is not to say that men ceased to believe in the ideal of harmony and in the possibility of achieving a society bound together by social sympathy. Indeed the introduction of Hegelianism and the new liberalism into Sydney during the 1890s injected a new vitality into these ideals of

liberal consensus. But such ideas were now the province of intellectuals and professional philosophers, and more importantly the changed context had altered the nature of many of the ideas. For example the new liberals came to feel increasingly that a conflict existed between the ideals of harmony and the laws of nature.

But that is another story. In the period from 1850 to the 1880s no such doubts existed: most educated men trusted that they lived in a world ruled by the natural laws of an all-wise, Just and Good God, that Beneficent Providence was taking them towards a better world and that they would eventually create a harmonious world bound together by man's natural social sympathy. It was an optimistic vision and one in which Science played a leading role but, and I refer again to the article with which I began this paper, who would not have optimism knowing that the future was "wholly in the hands of One whose purposes are infinitely wise and beneficent and who will infallibly make all things fulfil his mind"?

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