Viewing the Pacific through Enlightenment Eyes: La Pérouse 's fateful voyage of 1785-8

Introduction: What was the Enlightenment?

In a seminal article the great German philosopher, Emmanuel Kant, asked in 1784 'What is Enlightenment?' and historians have been answering the question since. As Kant indicated, the eighteenth century period known as the Enlightenment was more an attitude of mind than a definite creed. Kant described it as humanity's escape from self-inflicted constraints and a willingness to think as adults rather than relying on tradition. He linked this with a sense of intellectual excitement and daring which he captured in what he considered the motto of the Enlightenment: 'Dare to know. Have the courage to use your own reason'. Where did such confidence come from: very largely from the successes of the Scientific Revolution of the seventeenth century which were taken as confirming the possibilities of human reason. The ultimate icon of such an intellectual conquest was the figure of Isaac Newton and the achievement embodied in his great *Principia Mathematica Naturalis Philosophiae* (1687). This pulled together the advances of the Scientific Revolution in both astronomy and physics by showing that all bodies in the universe, whether on earth or in the heavens, obeyed the same set of fundamental laws of motion. The sense of triumph and possibility which Newton's work engendered among European intellectuals was captured in the obituary penned by the poet Alexander Pope when Newton was buried in 1727:

'Nature and nature's laws lay hid in night

God said let Newton be and all was light.'

Newton may have been English but the Enlightenment was a cosmopolitan movement which had an impact throughout Europe and particularly in La Pérouse's France, where it served to provide an intellectual yardstick to judge where reform was necessary and how to institute more effective ways of organising society. The Enlightenment mentality was linked to the goals of creating greater order and predictability and, where necessary, reshaping the muddle handed down by tradition into more organised patterns. Enlightenment language was often used by the critics of the old regime French establishment and some aspects of the Enlightenment were drawn on in the French Revolution. Before the revolution in the old regime France of La Pérouse, however, there were sections of society who were influenced by Enlightenment reforming ideals and these, I want to illustrate in the course of this lecture, were to have an influence of the great but fateful expedition of La Pérouse of 1785-8 which

encompassed the Pacific from Easter Island, to Hawaii, the west coast of the Americas, China, the Philippines, Siberia and Botany Bay before disappearing off the Solomons.

La Pérouse's Education and the Enlightenment

What were some of these background influences which shaped La Pérouse ? His early education was at the hands of the Jesuits, as was common for many of the sons of the elite such as the young La Pérouse who came from a family with aristocratic pretensions. This may not have seemed a likely introduction to Enlightenment values: however, it was probably no accident that so many of the French intellectuals associated with the Enlightenment (including Voltaire) were educated by the Jesuits. In the first place they provided a rigorous education and, secondly, it was an education which accorded particular significance to science. Mathematics particularly was valued as an aid to clear and logical thinking. The Jesuits, too, sought to use the new intellectual movements in defence of Christianity. By contrast, some of the major figures of the French Enlightenment used the currents of thought associated with the Enlightenment to attack Church and State. In some ways the Jesuits became the particular target of the anticlericals since they often spoke the same Enlightenment language though using it in defence of the Church where other intellectuals were using it to attach the established order in Church and State. This helps to explain why Enlightenment intellectuals were among those who were involved in expelling the Jesuits from France in 1764. La Pérouse was to reflect in relatively mild form some of the anticlericalism which was characteristic of the French Enlightenment (though less so elsewhere in Europe). When he visited the Spanish missionary settlements in California in 1786 he admired the devotion and selflessness of the Spanish Franciscan missionaries while describing the Jesuits as 'more skilled' as missionaries. But he was frank enough to describe himself as ' A friend to the rights of man rather than to theology' and questioned the way in which in his view the missionaries kept the Indians in a state of dependence.

By age 15 La Pérouse moved from his Jesuit school to a naval academy. The navy was more open to the new scientific currents than the army since modern navigation had become increasingly scientifically based requiring a considerable knowledge of astronomy and an ability to perform quite complex mathematical calculations. The young Napoleon recognised this when he applied to go on La Pérouse's great Pacific journey: as someone with few connections to the French Establishment he thought that his scientific prowess would be more recognised on a naval voyage than in the army. His application was unsuccessful and the rest

is history. To some extent, then, the navy depended more on merit than the army though in France the aristocracy had more of a grip on key positions in the navy than in England. It was less likely in the eighteenth century that France would produce someone like James Cook, the son of an agricultural labourer, who made his way up on sheer ability. Though the French navy was less meritocratic than the English in some ways it placed more emphasis on the importance on science since there were links with major French scientific bodies such as the Academy of Sciences which received much more direct state support in France than equivalent bodies in England such as the Royal Society. The young naval cadet, La Pérouse , then, was shaped by an institution which placed a considerable emphasis on the importance of applying science to navigation and to making sense of the world more generally.

Having made his name in the American War of Independence, in which French aid was critical in enabling the American colonists to defeat France's ancient enemy, perfidious Albion, La Pérouse was chosen as leader of the state-supported enterprise which was to be France's answer to the voyages of Cook. Like Cook's second and third expeditions it consisted of two vessels: *La Boussole* and *L'Astrolabe.* In keeping with the strong French emphasis on state support for science the expedition carried a much larger complement of scientists than had Cook with some ten scientists This was not without its problems: a naval ship was not always a hospitable environment for civilians not subject to the normal pattern of naval command. In the eyes of the naval officers, too, the scientists often had an overly inflated idea of their importance. In exasperation La Pérouse wrote of them 'Generally they are a class of people so full of self-conceit and vanity that they are difficult to manage during a long campaign. However I have gradually succeeded in making them tolerate each other, which is no mean feat.' Nonetheless, there was a great deal of common ground between the goals of La Pérouse and the scientists on board because the expedition was, in part at least, an enterprise to promote a fuller scientific description of the world and to shed light on its dark corners – particularly the Pacific which was little known to Europeans at least. Of course, intertwined with these scientific goals reflecting Enlightenment values were the predictable aims of any great power to advance their commercial and imperial interests. Nonetheless, the aspirations to bring back new knowledge were real and to La Pérouse another way to achieve the glory and renown which many of his fellow naval officers sought in naval warfare. His high hopes for the voyage were apparent in his parting remark that on his return 'there will not be one place of importance to explore on the globe'.

Measurement, the Enlightenment and the La Pérouse voyage

Let us attempt then to draw out some of the threads of the Enlightenment mentality which helped to shape the character of that ill-fated voyage. As I mentioned at the outset one of the great aims of the Enlightenment was to make the world a more predictable and manageable place by extending the scope of scientific knowledge or by using techniques modelled on the study of Nature to make the much more messy world of human society more comprehensible and capable of reform and improvement. All of this meant applying to the world the tools of measurement and classification as much as possible in the expectation that this would bring with it a greater ability to control the world. Understanding and controlling of the natural world, it was assumed in turn, would bring about improvement in the benefits humanity could draw from Nature. In short, knowledge would bring progress. So three key Enlightenment concepts stand out: measurement, classification and improvement. Of these I'll give particular attention to measurement both for reasons of time and because it was particularly central to a naval voyage such as that of La Pérouse .

Measurement brought with it the possibility of making the world both more comprehensible and more able to be used to promote greater human benefit. Mathematics had been the great tool of the Scientific Revolution and one of its brightest stars, Galileo, had written that the secrets of Nature were written in the language of figures. The more the world could be measured, it was assumed, the more amenable it would be to human control and intervention. If there was a theme to the elaborate scientific instructions given to La Pérouse by the Academy of the Sciences it was the need to measure as much of the globe as possible. His scientific party was told to bring back measurements of as many of the features of both the sea and the land as possible: among them magnetic readings which would help determine the variations between the compass and the location of the true rather than the magnetic North. The seas were plumbed for changing depths and monitored for the movement of the tides. Thanks to such measurements one of the scientists on board Jean Lamanon was able to draw significant conclusions about the way in which terrestrial magnetism increased towards the Earth's poles. As hoped, measurement led to scientific Enlightenment and with it greater command over movement around the globe: knowledge was power.

For both scientists and naval officers a particular preoccupation was measurement of latitude and longitude, the basic co-ordinates which made scientific mapping possible and, with it, control over navigating around the world – so in tracing the impact of Enlightenment ideals

on La Pérouse's voyage this is a subject worth particular attention. While latitude had been determined with reasonable accuracy by taking measurements from the stars determining accurate longitude had long been the bane of navigators. This was particularly true in the Pacific with its vast distances which meant that the traditional method of approximating longitude through dead reckoning particularly unreliable. For dead reckoning simply meant arriving at guesstimates of the position of longitude by working out the ship's average speed through paying out a rope marked with knots at regular intervals (hence the term 'knot' as a measure of nautical distance). The distance which it was estimated that the ship travelled was then worked out and the position of the ship determined by adding this measurement to the position for which there was a reliable measurement of longitude. In the Pacific such a rough and ready method was particularly prone to error since there were few fixed points to measure from and estimates of distance became ever more unreliable the greater the distance travelled. Hence early European travellers in the Pacific arrived on islands for which they gave such unreliable co-ordinates that it was almost impossible for others to find. Sorting out this muddle was challenge to the Enlightenment mentality with its determination to make the world comprehensible. It was one of Cook's great aims to provide accurate maps of the Pacific – a goal made possible by the considerable advances in scientific navigation.

One such aid was, of course, the famous chronometer invented by John Harrison in 1761 to keep accurate time even while at sea. Cook used this on the second and third Pacific voyages but not his first. Nonetheless, on his first *Endeavour* voyage, he arrived at quite accurate figures for longitude by using an alternative method, that of lunar differences. As the moon moves across the sky it acts as a kind of clock as its position changes relative to the distant (or 'fixed') stars. With the aid of the sophisticated astronomical tables developed in late eighteenth century England and France it was possible to work out the relative position of the moon in relation to the stars in whatever part of the world one was. This then provided a way of estimating the time where one happened to be and then comparing it with the time at Greenwich or, as the French insisted, at Paris. The difference then enabled the calculation of longitude. It was a method which called for a good deal of mathematical and astronomical expertise and it was often difficult to perform on cloudy nights or tossing seas. Yet it remained very important and we tend to overestimate the extent to which the Harrison chronometer took over. La Pérouse used both methods regarding both as important as a check on the other. It was an indication of the lavish resources with which the French state endowed the voyage that on board he had a very considerable number of devices of both

English and French manufacture with which to calculate longitude (as well as latitude) including five sextants, a range of clocks and telescopes, and three chronometers made by the leading French clock-maker, Ferdinand Berthoud, at the king's command. The estimates arrived at using these instruments were averaged out with the figures calculated by using the method of lunar differences. Given that the calculations based on the chronometers had to be adjusted to reflect different temperatures La Pérouse actually considered the figures arrived at through the method of lunar differences to be superior.

Dagelet, Measurement and Botany Bay

The role of measurement as one of the Enlightenment's chief tools for bringing order to the world and making it more amenable to human control is brought home in one of the episodes of the La Pérouse voyage which took place more or less where we're sitting: the work of the astronomer, Joseph Dagelet, here on the shores of Botany Bay. It was no easy task: he posted back one of his last letters from Botany Bay to Condorcet, secretary of the Academy of sciences, complaining that 'I am blinded by the bites of flies which weigh me down in my wretched observatory.' Dagelet was a veteran in the linking of astonomy with exploration having served on the Kerguelen expedition into the Pacific of 1773-4: this proved a debacle and Kerguelen was imprisoned for falsifying his claims about what he had discovered but Dagelet came away with his reputation enhanced for the astronomical work he had done on board. This led to a post at the elite Ecole Militaire (with Napoleon as one of his pupils) and it was from this post that he was recruited to go with La Pérouse in 1785. Because of the wreck of the La Pérouse voyage we have very few of his scientific calculations but we have enough to discern his determination to render as much of the globe as possible, and particularly the unknown Pacific, into measurements which could be expressed in mathematical terms. In short Dagelet was a prime example of the Enlightenment mentality in practice with its confidence in the possibilities of human reason. He also was evidently a congenial man to have on board unlike many of this scientific colleages. When La Pérouse vented his spleen about the difficulties of dealing with scientists he qualified it by writing: 'The absolute exception is Monsieur Dagelet who does the same work here as ourselves, and probably better than us.' By the same work La Pérouse was probably referring to such routine navigational tasks as the calculation of latitude and longitude.

Part of the reason that we know something about how Dagelet spent his time here on the shores of Botany Bay was that he wrote a very informative letter to the English astronomer,

William Dawes, whose early work in astronomy and the location of his observatory is commemorated in the name of Dawes Point where a later colonial observatory was constructed near what is the Harbour Bridge. Drawing on the work of Ivan Barko, Doug Morrison and Robert Young who have brought out some of the implications of this fascinating letter we have a cameo example of some of the characteristics of the Enlightenment at work here on what was, from a European perspective, a very distant shore. In the first place we see some of the cosmopolitanism of the Enlightenment at work. Though France and Britain were at war on and off during most of the eighteenth century (though when the La Pérouse expedition called in at Botany Bay just after the arrival of the first fleet the two nations were at peace) the crew of La Pérouse 's expedition and the English officers at Botany Bay maintained remarkably good relations. As La Pérouse remarked : 'Europeans are all compatriots at such a great distance'. That didn't pre-empt some of the customary national rivalry and secrecy. La Pérouse commented that he English 'seemed to be creating a great deal of mystery around Commodore Philip's future plan' though the French were equally circumspect about where they were heading after Botany Bay.

Cosmopolitanism was most evident in the realm of science since it offered greater scope for co-operation in an area where national interests were not so evident or pressing. This had been demonstrated with the international partnership involved in observing the transits of Venus in 1761 and 1769, with the latter being the chief ostensible reason for Cook's *Endeavour* voyage. Of course, as with the *Endeavour* voyage, scientific goals could be combined with strategic and imperial aims but, nonetheless, there was in the eighteenth century a recognition that the advance of science was of sufficient importance to transcend national rivalries, on occasions at least. Thus, when La Pérouse's expedition was fitted out, Sir Joseph Banks, president of the British Royal Society and former naturalist on the *Endeavour* voyage, did what he could to facilitate its scientific goals and, particularly, those which concerned the charting of latitude and longitude around the globe. It was he who provided the expedition with two dip-needles used by Cook. La Pérouse, as he wrote in his journal, received the latter with 'feelings bordering almost upon religious veneration for the memory of that great and incomparable navigator'.

In miniature, this same spirit of cooperation was reflected in the very cordial relations between Dawes and Dagelet. Dagelet imparted to Dawes the precious information of the co-ordinates of latitude and longitude which the French had arrived at at Botany Bay, a useful check on the calculations made be the British. These he probably arrived at primarily by

astronomical methods using lunar differences -- though on occasions some of the scientifically more sophisticated also used calcuations based on the movement of the moons of Jupiter. Very probably, however, these were supplemented by the use of the ship's chronometers. He also drew on Dawes' good offices to post back to France an account of what was, as Morrison suggests, probably the first systematic experiment conducted in Australia – though the actual measurements were lost. This concerned pendulum experiments which were intended to provide further information about the shape of the earth. For, given that the globe is egg shaped, with a bulge at the Equator, the force of gravity varies around the earth. Again the preoccupation with measurement becomes apparent. If one took a pendulum calibrated to move backwards and forwards with a second's duration in each direction it would be possible to calculate the varying length required to maintain that swing of a second to and fro as one moved around the earth – and hence variations in greavity which related to the varying shape of the earth. The French, with the help of its state-supported Academy of Sciences, has long supported such research around the globe. Hence Jean de Lamanon, a naturalist on La Pérouse's voyage, looked back with national pride on the way in which 'the French have determined the shape and dimensions of the earth by their calculations'.

Dagelet was, then, concerned with measurement as a tool for better understanding the shape of the globe. These ongoing experiments around the earth were also prompted by one of the great goals of the Enlightenment: the establishing of basic measurements of length which would be universal rather than depending on all the different local and national variations such as the length of different parts of the human body. Its most eloquent advocate the Marquis de Condorcet wrote that 'The metric system is for all people for all time'. Such a goal reflected both the cosmopolitanism of the Enlightenment and its confidence that, if Nature was properly understood, it would provide an orderly model for arranging human society. One way of providing such a universal measure was to use the length of a seconds pendulum.The snag was that this length varied slightly around the globe as the force of gravity varied. Back in France the Academy of Sciences continued to deliberate on the possibility of a universal system of weights and measures to replace the very messy French practice of having regional measurements. The hope was that with enough data of the sort being compiled by Dagelet it might be possible to arrive at a basis securely located in Nature rather than simply human fiat which could take account of variations around the globe.

In the event the metric system of measurements was not introduced until 1793, one of the most enduring monuments to the Enlightenment's hopes of bringing greater order and regularity to human affairs through drawing on the sort of order in Nature which had been revealed in Newton's work. It took the Revolution to cut through the hold of tradition to bring about such a change. It was hoped that other nations would follow the French rational example but, of course, its association with the Revolution was one of the reasons the English did not follow suit. It was not based on the length of the pendulum but on a fraction of the distance between the pole and the equator, a quadrant of the earth's circumference . By helping to establish the shape of the earth, however, the pendulum gravity experiments helped in making such a calculation possible. Calculating the distance of this quadrant in the Southern Hemisphere was another of Dagelet's aspirations and something with which he urged Dawes to persist. Given the irregularity of the shape of the earth working out exactly what was the distance of the metre defined as one ten-millioneth of such a quadrant involved defining which meridian of longitude one was using. Needless to say, the French chose the one nearest to Paris conducting another elaborate expedition to calculate it as exactly as possible. Human nature being what it was nationalism creeped in with the metric system having Paris as a reference point and longitude Greenwich, London – though the French continued to base their calculations of longitude on Paris until 1911.

Classification, Improvement and the Limits of Enlightenment

Two other major themes of the Enlightenment which were reflected in La Pérouse 's voyages (among others) were, as I have mentioned, classification and improvement. Classification made the world manageable and capable of being ordered to the benefit of humankind. The eighteenth-century Enlightenment mentality was captured in the systems of classifying plants and animals devised by the Swede Linnaeus and by others such as the Frenchman Antoine de Jussieu. These were regularly employed by the scientists on board and especially by the naturalist cum chaplain, Fr Louis Receveur, whose grave is only a few yards from here. The urge to classify extended to human societies and the different forms that they took. Hence the instructions to La Pérouse to 'see to the collecting and classification of clothes, weapons, ornaments, furniture, tools, musical instruments and all items used by the various people he will visit'

Classification brought with it both intellectual clarity and the possibility of greater utility as the knowledge gained could be put to systematic use. This linked with the great Enlightenment goal of improvement or progress. Improvement was primarily linked to more

effective use of plants and animals and one of the major goals of the La Pérouse voyage was to spread such advantages around the globe including into the Pacific. When La Pérouse visited the Californian missions in 1786 he contributed 'different seeds brought from Paris, which had kept perfectly and will provide them with added benefits'. This goal of improvement was enthusiastically endorsed by Louis XVI himself who took an active interest in the expedition and whose instructions to La Pérouse included the admonition in relation to the peoples he would encounter: 'He will zealously exert himself in every thing that can improve their condition, by bestowing on their country the pulse, fruits, and useful trees of Europe; by teaching them the manner of sowing and cultivating them'.

Yet improvement could also link with imperialism as different parts of the globe were planted with crops for the benefit of the colonial power. La Pérouse himself appears to have regarded imperial expansion with some contempt. When he reached the Hawaiian island of Maui he declined to take possession of it in the name of the French king considering 'The customs of Europeans on such occasions are completely ridiculous'. But, ultimately, he was the servant of an expansionist state in a constant state of rivalry with its national rivals and especially Britain. His presence at Botany Bay, for all its civility, was the result of changed instructions from the French government reflecting their suspicion about what was going on there. The Americans thought, quite plausibly, that La Pérouse's change of plan to incorporate a visit to Botany Bay was part of a larger French imperial design. The Paris-based John Paul Jones told Thomas Jefferson that the move was prompted by plans 'to establish Colonys in New-Holland after having well explored the Coast'. Jones suggested that any such Australian colonies could link up with the existing French bases in the Indian Ocean. Such a possible design conformed with the larger French view of the world with, as they saw it, the need to contain the restless British intent in dominating more and more of the globe's surface.

So the Enlightenment impulses which we have seen helped to shape La Pérouse 's voyages were in tension with the national context within which such voyages took place. The French state financed such voyages primarily to advance its commercial and imperial goals though its scientific character was also important. The Enlightenment itself could in some forms act as an agent of greater cultural domination with its assumption that all peoples and cultures should follow the same patterns of thinking and reason without a lot of regard for human diversity. Yet the characteristics of the Enlightenment which were embodied in the La Pérouse voyage provided much of the intellectual foundation for the advance of modernity

and the forces of globalisation which have shaped and continue to shape the world in which we live.