

## SEEING NEAR AND SEEING FAR<sup>1</sup>

Using what we know about the reasons for myopia and the history of the Mongoloid peoples who colonized eastern Asia, it is worth sketching out a 'conjectural history' of what may have happened. Obviously this will need to be investigated further by experts and its plausibility assessed. In the absence of direct statistical evidence of myopia rates in the medieval and early modern periods in eastern Asia we shall always have to indulge in guesswork.

China and Japan are populated by Mongoloid peoples who originated in northern Asia. These peoples have also expanded into the Americas, the Pacific and South East Asia. One of their most distinctive features is the well-known 'Mongolian Eye'. There are wide variations in this eye, but several characteristics are always or often present. It is always brown or almost black; there are no blue-eyed 'true' Mongolians as far as I know. Secondly, there is the characteristic eye-fold near the nose, which often covers off one part of the lens. Although not always the case, from casual observation the actual size of the eye-ball seems relatively large. Also, although not always the case, other parts of the cornea are covered over, both at the top and the bottom, by eye-lids, so that only a part of the eye is normally visible. No doubt, if we go deeper into the subject we will find other characteristics. For example, I believe that I have read somewhere that the Mongolian eye has its cones and rods arranged in a different pattern. The retina may have a different micro-constitution which might mean a different susceptibility to high and low light levels. As I recall, this means that with such an eye, seeing in low light is more difficult.

If we consider the early environment where the Mongolian peoples developed after they migrated from Africa (check with MIASU), this all makes sense. Whether in the circum-polar regions with the white glare of snow, or on the vast open spaces of the steppes of northern China and Russia, two things in particular were required in the eyes of these nomadic pastoralist peoples. One was the ability to see vast distances, in detail, to survive; they had to be able to judge changes in weather, grazing, the position of their herds and their prey, and the approach of predators, human or otherwise. The acute long-distance sight of the Mongolian herdsmen is legendary, as famous as that of many of the hunter-gatherers in Australia or Africa. <sup>2</sup> The narrowing of the aperture of the eye helps in this long-sight and gives depth of vision, just as in

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<sup>1</sup> This title is also the title of a book by Ludovici.

<sup>2</sup> A typical anecdote where African natives could distinguish clearly the nature of a speck on the horizon which a western observer could not make out even with binoculars is reported by John Browning. Browning, **Our Eyes**, 108

Professor Caroline Humphrey, who has for many years worked in Mongolia, has confirmed the amazing eye-sight of the pastoral peoples there today.

a camera. Secondly, the enormous glare, combined with the danger of damage from the fine particles of dust and sand in the Mongolian heartlands, all must be dealt with. Night vision was less important, close work less essential. Thus it would seem that enormously powerful eyes, almost like miniature telephoto lenses or telescopes, were developed for seeing long distances in bright light. We would expect to find that the actual ratios of the different parts of the eye were affected by this so that the light and the images could best be captured.

This adaptation to a world where much of the time was spent out in the open, scanning for distant objects, was made more effective through the diet. Pastoralists, like many of their hunter-gatherer predecessors with excellent long vision, and most famously the Mongols, live off a diet with a strong component of meat and milk. As we have seen, meat and milk are two of the main sources of Vitamin A. Vitamin A is the main dietary contributor to good eye-sight, the source of retinol. So for thousands of years an effective adaptation took place. Long-sighted peoples in a world of meat and milk.

Over time these Mongoloid peoples expanded, right down into the Pacific, northern India and as far as Turkey. They covered two thirds of the Eur-Asian continent and its adjacent areas, including Japan. In many of these areas, for example in Tibet, and northern Nepal where I work, their eyes were fitted to the same job and they continued as pastoralists. So in the Gurung village of Thak, where I have worked as an anthropologist for thirty years, I have not noted any particular eye problems, except the usual ones of cataracts and presbyopia.

The situation in China and Japan, however, developed in a different way. Firstly, over the centuries, the diet changed. The rich protein and vitamin A diet gave way to a carbohydrate diet based on grains. In particular, in the central region of the Chinese rice belt as it developed during the Sung period (C8-C13), the peoples gave up much of their meat and milk. Even the vegetables, as Rasmussen and others have noticed, became leached and lacked flavour and may have been short of vitamin A. The extreme example, as I have studied it, is Japan, where Buddhism combined with shortage of good rice land led to a meatless, milkless, eggless, diet.<sup>3</sup> Eye problems we know were rife [see the bits I used and did not use for Savage Wars XXX] and not all were to do with hygiene.

Added to this, and inter-acting with it in a complex way, was a second factor, a change in occupations. Instead of riding the wide ranges or hunting animals, the Mongoloid peoples in China and Japan became sedentary. Many of them became craftsmen, working on intricate materials. Others became settled agriculturalists. A small but growing section of the elite became scholars. Whereas the Gurung peoples of central Nepal with whom I work were, until the last generation, a pre-literate civilization with no written language, both China and Japan are famous for their early development of an amazingly sophisticated and complex writing system. In effect,

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<sup>3</sup> See Savage Wars, XXX

when combined with that Confucian emphasis on education as a way of allocating status which has briefly been described above, this means that a peoples who had traditionally used their eyes for seeing many miles, were now concentrating their attention on tiny marks on paper or other surfaces a few inches from their nose, which they tried to copy, learn and read. Nor were they just doing this from time to time, or in relation to a few marks, or having to concentrate part of their minds. The intensity of Chinese and Japanese education is legendary and has been described above.

This strain on the eyes was exacerbated in the past by other factors. The absence of glass windows in China and Japan meant that the reading, writing and memorizing was done in rooms with very poor light, often coming through small or paper-covered windows. Furthermore, the process was made more demanding by the well known fact that eye and brain work together, and the Chinese language put an enormous strain on both. In terms of visual pattern recognition, an individual who wished to become successful needed to be able to recognize, both visually and intellectually, up to about eight thousand 'kanji' characters. These each had tiny, but significant, differences: as one child learning English asked, 'at what angle do I write the letter 'a'? So the tiny strokes not only have to be read, but mastered in writing, and stored in the mind. And with black ink quickly absorbed from the brush into the paper, mistakes cannot be corrected. There are no rubbers. It is not difficult to imagine the strain.

So we take eyes already weakened by a dramatic withdrawal of vitamin A, and which have been well adapted to the wide spaces and intense light, and subject them to a new regime. We seat the pupils for long hours in badly-lit rooms, studying, memorizing, copying tiny strokes of a brush on paper. What is the result? Well, as we saw earlier, it is myopia rates which end up at between 70-80% in the general Japanese population, and in some specialized groups, such as lawyers in Singapore, at 98%. That Eskimo (Inuit) children can move from 2 to 45% myopia in one generation, solely, it seems, on the basis of a move from oral to school education (and up to 65% in two generations) suggests what may have happened. The dramatic change among the Inuit is perhaps partly accounted for by the same factor as described here, the particularly well adapted long-sight of the Mongolian eye among them, attuned to distant sight in a bright landscape. How much greater the effect in China and Japan has been when it is compounded by much longer hours of schooling, the minute Chinese characters, the absence of glass windows for lighting and, for many centuries, the effective withdrawal of the retinol supply in meat and milk, it is difficult to estimate.

One of the interesting facts about all this is that if I am right, namely that the underlying causes of myopia are a certain eye shape, a certain educational and linguistic system, a certain diet, a certain absence of glass windows, none of these factors is recent. What is new is that a number of these factors now affects the whole population, all of whom are now compulsorily educated. In the past it probably only seriously affected a smaller proportion, though the number of children who at least started on the educational ladder in these Confucian influenced civilizations was probably much higher than in comparable periods in the West.

So it does not seem unreasonable to argue that from at least the fourteenth century, if not earlier, the tendency was towards increased myopia. The settling down of the Mongols after the conquests of Genghis and Kublai Khan, and their further absorption into a bureaucratic civilization, combined with the intensification of rice cultivation, which occurred in both China and Japan as population built up caused this. It has continued in heavily urban, Chinese-speaking countries such as Taiwan and Singapore. Obviously further research will be needed to show more precisely how the Mongolian eye is distorted by 'near-work' and diet, but this may have been the rough shape of what happened.

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The second way to approach a period when records are meagre is through looking at possible effects, and hence working back to possible causes. This also has a wider interest, since ultimately it is the consequences of differences in vision that we are concerned with. Again we may use Rasmussen's ideas as a starting point. Although he only concentrated on one or two possible effects, they are certainly audacious and intriguing.

[This section should probably go a little later under consequences] One of his major suggestions concerns the nature of Chinese art. He wrote that 'The theory that Chinese painters, who were nearly always literati poets and philosophers, and therefore men whose eyesight may be considered weak, painted the spirit rather than the material, would not altogether account for the invariably minute, almost photographic foreground detail, and the misty back-ground of their pictures.' We are then told that early Chinese artists, from roughly 300 to 1300 A.D. 'pictured near objects in detail and their distance as a more or less complete blur'. If we try to explain this by alluding to some idea of 'spiritual impressionism' it 'does not explain why they were able or wanted to "memorise" and depict so many of the nearest objects in such material detail. Nor does it explain why their spiritualistic conceptions are confined almost invariably to background and not to foreground subjects. It also does not explain why in some paintings the features of a person situated at a distance beyond the discrimination of perfect visual powers should in a Chinese painting often be painted in minute detail. Such details were memorized from a close observation and not from actual view at the distance.' (p.56)

Rasmussen then explains that the way in which painting was done in China was very different to that in the post-Renaissance west, and that this exacerbated the effects of eye-sight. Chinese landscape painters did not paint on the spot. 'They simply wandered about or sat in meditation and then went back to their studios without a sketch or any sort of rough drawing to paint their pictures.' Rasmussen had also noted that 'they compose their pictures with the silk scrolls...stretched out on a flat table. They did not compose with their fabric in the vertical position as common with Western painters.' The result might again be that 'with the foreground objects in such great detail, and this foreground at the bottom of the scroll nearest to their eyes, that whether they relied upon actual vision or upon "memory vision" they were still handicapped by short-sightedness.' Rasmussen wisely comments that 'this in no way implies that the Chinese would have developed a totally different system of painting even if they had not been

limited by eyesight'. But he cites an article in a journal of 1936 which suggests that almost half the artists in an American study were myopic & this would have a considerable effect on their art. (pp.56-7)

There does seem to be something intriguing here in the relation between painting and myopia. It is a theme partly picked up by Trevor-Roper. He suggests that 'the paintings, of the myope deserve more detailed inspection... Most striking is the influence on visual imagery, for the myope (unless he wears glasses constantly) necessarily tends to avoid describing details that are outside his limited focal range.'<sup>4</sup> One aspect is the distance from which the paintings of a myope should be seen. He writes that the 'the myopia... of an artist will have a direct influence on the optimum distance for viewing his work. Artists who record on the rectangles a relatively small view, normally use a simple geometrical perspective, the laws of which remain approximately accurate only for such a "narrow-angled" span.'<sup>5</sup> The mechanism involved is explained as follows. 'However, most artists, to a greater or lesser extent, subconsciously use a 'cylindrical gnomonic projection' (such as the conventional Mercator's map of the world) to transpose their view on to a two-dimensional canvas from the surface of the imaginary sphere encircling their heads, on which it seems to be disposed. But the wider the 'angle' of their view, the more necessary it is to observe the rendering from the same point as that from which it was seen by the original artist who painted it...'<sup>6</sup> Trevor-Roper even notes the fact that Chinese artists tend to have most of their detail 'crowded into the lower left triangle'. But he does not, unlike Rasmussen, link this to myopia, but rather to 'gravity'. He notes that 'the reverse is often true of Western art'.<sup>7</sup>

It is helpful to counter-balance this with the observations of a Chinese specialist. Mark Elvin observes that 'Arguments from art are precarious. Use of water-based medium on absorbent paper or silk requires the images be conceptualized before execution. Reworking, easy in oils (though much less in tempera), is all but impossible. Horizontal placement of the paper is also required to stop water running.' He further observes that 'preference, on the whole, for a mobile implied vantage-point for the observer, rather than the uniquely anchored point implied by strict perspective, was probably cultural. (The viewer is an "immortal" who can tread the clouds.'<sup>8</sup> [I have other evidence on this which I shall add later.]

It is tempting to go beyond this to other art forms. For example, in Japan, one wonders whether any of the strange conventions of drama - noh and kabuki - were related to this. There are the strange sounds and gestures of Kabuki, the absence of the importance of facial expressions, the huge costumes, particularly using the red end of the spectrum, the facts that (as can be seen in traditional prints) the audience tend not to look at the stage and often face away

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<sup>4</sup> T-Roper, Blunted, 31

<sup>5</sup> T-Roper, Blunted, 43

<sup>6</sup> T-Roper, Blunted, 44

<sup>7</sup> T-Roper, Blunted, 123

<sup>8</sup> Mark Elvin, person communication.

from it, even the way in which there is a projecting foot-way which takes the actor out into the audience, so they can see him more closely may be important. They all suggest an audience which found it difficult to see what was going on in a dimly lit hall at some distance.

The red and gold kabuki costumes suggests that widespread myopia may also have affected the discrimination of colour. Whereas a typical European will see the blue end of the spectrum most clearly, it seems likely that Chinese, Japanese and Koreans see the red end of the spectrum more clearly. As Trevor-Roper noted 'it is a curious coincidence that colours from the red end of the spectrum should play so large a part in the paintings of Chinese and Japanese, which are predominantly myopic (the Japanese have only recently adopted a specific word for blue).<sup>9</sup> To this could be added that the primary colours in these three countries, apart from black and white, are brown-red, yellow-red, and blue-green. That two should be from the red end of the spectrum and the other from the region closest to that end is interesting. Likewise the fact that many costumes, for example in kabuki theatre, are red and yellow, is notable. Asking young Japanese friends to pick out coloured clothes from a crowd, they picked out reds and yellows, rather than the, to me, brighter blues and greens. The famous red, rather than yellow, sun on the Japanese flag is also often mentioned. The link with myopia is explained by Trevor-Roper as follows. 'The blue rays of light are refracted more than the red, and so are brought to a focus slightly in front of the normal retina, and the red rays correspondingly just behind it; hence the myope, with his abnormally long eye, will see red objects in better definition...'<sup>10</sup>

It would also be interesting to look more closely at literature. [Here one might add in the Rasmussen material from above]. Certainly in the west the contrast in the images used by a myopic poet such as Keats, and a poet such as Shelley, are illuminating. Those of Keats are based much more on the other senses of smell and sound, or much more fanciful, while Shelley deals with distant prospects.<sup>11</sup> Or again, Tennyson's imagery, including some of his most famous lines such as 'the long light shakes across the lakes' or the reply of XXX when asked by the dying Arthur as to what he saw, to which XXX replies in terms of the sounds 'the lapping of lake water' etc. It might well be possible to examine the very rich literature of Japan and China with this in mind.

This could be broadened beyond art and literature. Mann and Pirie suggest that we 'think about the effect on the possessor of what is called long sight.' The effects on 'certain patterns of our civilisation, for example, our seating arrangements in cinemas and theatres, the size and position of public notices such as signposts, the use of the blackboard in schools and others of our common arrangements, which presuppose clear sight for things more than six yards away.'<sup>12</sup> If we turn this on its head, and wonder what a civilization with very high myopia rates

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<sup>9</sup> Trevor Roper, *Blunted*, 42; the Tibeto-Burman peoples with whom I work as an anthropologist, the Gurungs, also only have a word which means blue-green (**pingya**).

<sup>10</sup> T-Roper, *Blunted*, 42

<sup>11</sup> T-Roper, *Blunted*, 31

<sup>12</sup> Mann and Pirie, 147

might exhibit, a number of curious features of Japanese civilization take on a new meaning in a world where 'A short-sighted person can often recognize a friend across the road, but it is by his clothes and gait rather than by his features.'<sup>13</sup>

So one is led to wonder about the famous ceremonious bowing which is more easily observed than the minutiae of facial expression, the generally impassive expressions, the giving of name cards to indicate identity, the emphasis on whole body communication (**hara**) rather than facial gestures or speech. What one would have to do is to walk round Japan with special glasses which created myopia - and then see how many things were visible & how human art and gestures and use of noise had made them more so. Is this a landscape created for the visually-challenged?

One intriguing area is the non-development in China, where gunpowder was invented, of far-sight weapons. Of course there are other reasons for this, but it may well also be partly related to the fact that the Mandarin class, at least, would not have found them easy to use. Here it is worth quoting Mark Elvin (personal communication), to the effect that 'The temporal trends **might** possibly be seen in a deterioration of Manchu and Mongol eyesight as their lifestyles became sinified in the Qing period. Activities that would have been affected are shooting with bow, and later the musket, and hunting and following, apart from traps. Among Chinese, looking at the stars could have been affected.' It may thus be more than a coincidence that the famous Zen art of archery required the archer to learn to fire the arrow without having to look at the distant target.

Another effect might be the famous skills in 'micro work' which have long impressed western observers about Japan. The intricate traditional crafts of lacquer, inro making, bonsai (miniature plant) growing, the intricacies of the tea ceremony. Here it is worth quoting Mann and Pirie (p.150) to the effect that 'Shortsighted people therefore seem to be cut out by nature for a life of close work, and they practically all choose it for themselves. They are the ivory carvers, the illuminators of manuscripts, the miniature painters and the students of the past, just as the long-sighted ones are the hunters, sailors, and men of action.' That this may have a direct continuity into the famous Japanese skills in certain branches of modern manufacturing, many of which have the suffix 'micro' (micro-engineering, micro-electronics, micro-computing), does not seem implausible.

One also wonders about the shape and nature of Japanese homes and their furnishings, so beautifully described for example for the nineteenth century by Edward Morse.<sup>14</sup> The rooms were tiny, as were the houses, and the absence of furniture and their simplicity would make

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<sup>13</sup> Mann and Pirie, 149

<sup>14</sup> Morse, Japanese Homes

them ideal for a people who found focusing on objects even at the far end of a large room difficult, and who might find moving around in crowded furniture trying.

Another well known feature of Japan is the emphasis on the other sense organs. The sense of smell is particularly well developed in Japan. Not only are the revolting smells of foreigners often commented on, but there has been a huge development of the art of discriminating scents. Numerous books exist on the subject and the palate of different scents and incense was vast. The famous tenth century novel by Lady Murasaki, the **Genji**, is full of competitions to detect subtle variations in scent, and the approach of the Prince is often detected before he arrives by his scent.

Likewise there is a very heavy emphasis on sound. Tiny sounds are noted and used, the sound of water dropping, the tinkling of bells, the sound of a frog jumping into a pool, various taps and clicks during the tea ceremony. A Japanese friend suggested to me that the Japanese had a better sense of hearing because their eye-sight was poor. It would be interesting to test this.

Again, one notices the love of whole masses at a slight distance, rather than small things which might not be seen. Thus the whole tree of cherry blossom, a cloud of pink and white, a full moon, the shape of Mount Fuji which is so distinctive and obvious. This is rather poignantly caught as follows. 'If a child is born short-sighted it will make no complaint. this is often not realised, but is obvious if we stop to think.... a small short-sighted child given glasses for the first time and sent for a walk shows the state of mind. She said "Look! Do you know that a tree is made of leaves?"'<sup>15</sup> (Mann & Pirie, 159)

As we shall see (have seen), there is a notable absent of 'prospects', of viewing points, of sight-seeing spots, in traditional Japan. This was noted by Screech, who put down the absence to political pressures against spying, but this can hardly explain it. Much more likely that many people would not have climbed the crags or towers which filled western countries since they could not see from them - until the introduction of eye-glasses from the west in the eighteenth century when, suddenly, going up in balloons and looking out over the countryside became a craze.

The last area, [which may be put elsewhere] is more controversial, but worth considering. This is the effects of myopia on personality. This is difficult ground, but here are a few suggestions. Mann and Pirie in 1946 suggested that a myopic child is 'intensely interested in books and in all fine detail and very bored with games.... Such children win scholarships and may be correspondingly unpopular... they drift into jobs entailing close work, they get round-shouldered and peer at their work. They get wrinkles at the corners of their eyes because they are always screwing up their lids to try to make a sort of "pinhole" camera to help them to

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<sup>15</sup> Mann and Pirie, 159

see distant objects better, and this gives them a feeling of strain.'<sup>16</sup>

The theme of the effects of myopia was expounded three years later by Gesell and others as follows. 'Myopes frequently show a precocious interest in books as early as 18 months or 2 years of age.... The pronounced myope shows an overconcentration on near-sector activities, which in turn may eventuate in precocious reading and verbalization, and in a marked topical card-index type of memory. He shows overcentrality and overidentification. He overholds and has difficulty in making transitions. He is also reported to have a low appetite. He is overaware of colour, and uses it prodigiously for distant vision cues, and for making fine distinctions in hue and shades. Introjective trends are uppermost. He gathers all the experience into himself, and he is in consequences better oriented within himself, but not so facilely oriented to his physical and social milieu. He is very demanding of people.'<sup>17</sup> This, which I may not use, chimes in rather well with some of the psycho-analytical literature on Japanese personality by Takeo Doi et al. (see refs.)

The theme has been explored by Trevor-Roper in a section called 'The Myopic Personality' and in a short appendix to his book, which takes the theme of an eye-specialist's remark 'But you don't understand, we myopes are different people.' He refers to 'the studious and rather withdrawn myope', and quotes a long and fascinating passage from a Dr. Rice as follows: 'A near-sighted child cannot do well on the playground because he cannot see. He will not like to hunt because he cannot see the game or the sights of his gun. He will not like to tramp because distant objects are poorly seen and, for that reason, not appreciated. He will not like races or aviation or travel or sports of any sort. As a rule these persons do not like the theatre, or the motion picture... The child who knows that he cannot excel over his fellows in games gets a big satisfaction out of the conquest of the mind that he can command... He pleases his teacher but he loses his friends.... Such a child as we have described is not dependent on others for entertainment and is liable to grow rather contemptuous of the abilities of others. He does not adapt himself to the surroundings and is not willing to make compromises.'<sup>18</sup>

A number of the themes above overlap with earlier consequences. How far does this help us to understand traditional Japan or China one wonders? It certainly makes one keep a look out for signs.

### **The possible major divergence in ways of seeing.**

In this kind of discussion, it is extremely important to avoid any overtone of moralizing or

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<sup>16</sup>Mann and Pirie, 160

<sup>17</sup> Gellell & co., pp.285-6.

<sup>18</sup> Quoted in T-Roper, **Blunted**, 21-2

superiority. Even the title of a chapter along the lines of Trevor-Roper's **The World Through Blunted Sight** would be inappropriate. It is true that myopia is now regarded as a disability and many consider it a misfortune. In fact, it has many advantages and has been behind much of the creative work in both East and West. A person with myopia probably inhabits a more intense, intimate, meaningful, kind of world. Myopes see the world at a different angle, in an unusual perspective, which is perhaps why myopes are 'more numerous in art schools, where they generally prefer to paint with their myopia uncorrected or undercorrected.'<sup>19</sup>

Many of the greatest poets have been myopic: Milton, Pope, Goethe, Keats, Tennyson, W.B. Yeats.<sup>20</sup> Among writers, James Joyce, Emile Durkheim and Edward Lear were myopic. Notable myopic musicians included J.S. Bach, Beethoven, Schubert and Wagner. Gregor Mendel the inventor of modern genetics is another myope. We are told that 'among really gifted mathematicians, myopes are four times as common'.<sup>21</sup>

Perhaps more surprisingly, many of the greatest painters, for example Jan Van Eyck, Durer and possibly Vermeer, were myopic. Myopia was particularly prevalent among nineteenth century impressionists, for example Cezanne, Degas, Pissaro. We are told that 'a survey of the 128 masters and pupils at the Ecole des Beaux-Arts in Paris found 48 per cent to be myopes and 27 per cent hypermetropes, whereas in the population at large it is the hypermetropes who are about three times as numerous as the myopes.'<sup>22</sup>

Thus Trevor-Roper concludes that 'Myopes are indeed rather an elite; they have a relatively high IQ, they preponderate in the higher educational and income levels and in the higher Indian castes...'<sup>23</sup> They also have the compensation, as we have seen, that there is far less problem of reading in older age without glasses. Furthermore, 'many short-sighted (myopic) people can read for hours without glasses and without discomfort, since in doing so they use less muscular effort than the "normal."<sup>24</sup>

It is thus essential to avoid the pejorative overtones reminiscent of what one used to find in school play-grounds, where the children with glasses for myopia were picked on as swots etc. This is dangerous ground and it would be very unfortunate if it was taken that one was arguing that the half of the world's population who use Chinese characters (not to mention orthodox Jews and other heavily myopic sub-groups) was somehow inferior to the long-sighted peoples of the western world.

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<sup>19</sup> Trevor-Roper, article, last page.

<sup>20</sup> For evidence of the myopia of all the following, see Trevor-Roper, *Blunted Sight*, esp. 36-44. Durkheim is my own addition, on the basis of portraits, his writing and his strict Jewish up-bringing.

<sup>21</sup> T-Roper, *Blunted*, 23

<sup>22</sup> T-Roper, *Blunted*, 42

<sup>23</sup> T-Roper, Article, p. XX

<sup>24</sup> Mann and Pirie, 149

On the other hand, it is not wise just to ignore the possible differences for fear of being thought politically incorrect, racist, Orientalist, determinist or whatever. Instead we can see that there is a possible added twist to the story of the development of glass instruments in east and west.

At the over-simplified level work on vision suggests two different trajectories at the two ends of Eur-Asia. Just as in many other areas, from toilet systems (water closet: night soil) to agriculture (industry: industrious), so in relation to visual knowledge, the divergence, until very recently, may have been growing larger. This difference was not, as I had previously thought, merely that western Eur-Asia developed more precise vision through glass and its associated developments in science and the Renaissance but this was absent in China and Japan. In other words, it is not just that European vision improved dramatically and left other vision 'naked' as it were. That might be a true categorisation of what happened in relation to hunter gatherers in Australia, tribal peoples in Southern Africa or the Americas, or even peasants in India and Nepal. But in relation to the really high-level civilizations of Eur-Asia (apart from Islam, which is another story), in other words China and Japan, then it is more than just a matter of these civilizations just remaining static while the west developed instruments of more precise vision made of glass. There was a movement over the centuries in China and Japan, but in a different direction. This movement was towards a world with an attention to microscopic detail, the dominance of senses other than the eye, combined with less accurate long sight.

If one wants to push the thesis to its extreme, one could suggest that this again helps to bring out what is peculiar about the west. Western glass technology extended the already reasonable eyes with telescopes and microscopes, and corrected the effect of old age with spectacles. The Chinese and Japanese turned their eyes into virtual microscopes, having earlier had eyes which were virtual telescopes. But this was at some cost to themselves and helps explain some odd off-shoots in their civilization, just as glass does in the West.

In the west between the thirteenth and eighteenth centuries the growth of glass tools led to those increases in reliable knowledge documented in earlier chapters, the possibility of seeing further, deeper, more precisely. In India and the Islamic civilizations, there was finally stasis. In China and Japan eye-sight, or at least the ability to see far off, may actually have deteriorated. Reliable knowledge of certain kinds may have levelled off or even decreased. The world became flatter and closer, the authority retained from the past when the world seemed clearer was increased, curiosity to discover new things was diminished, the written word and memory of past achievements was stressed. In the west, seeing is believing, in the east, hearing and reading is believing. Smelling and hearing and remembering are privileged in the east, experimenting and touching and seeing in the west. This was re-enforced by language, a veil of complex writing in the East, whereas the West increasingly became an oral and visual culture. Both have their charms and their advantages, but in the grim world of practical politics it was the western solution, to extend the human eye with glass instruments, which won the competitive battle. Now all the world has spectacles, glass mirrors, microscopes and telescopes. And we have

forgotten the thousand years of history when things were very different.