The inheritance of intelligence, and its implications

John Turner, Emeritus Professor of Biology at the University of East Anglia

Sunday 21st October at 7.00 for 7.30pm
At Daniel Hall, Long Garden Walk, Farnham, GU9 7HX

This talk addressed that most important of all human abilities, intelligence, the ability to think and reason. Intelligence sets us apart from all other life-forms and, although some animals do show intelligence, it is not found to the same extent that it is found in humans. The talk was supported by slides and references.

He made the case that:

- Individuals differ in their intelligence.
- Intelligence is largely inherited.
- Intelligence is a major determinant of life's outcomes.
- New research is identifying genetic data which determine our intelligence.
- He suggested that that the identification of this genetic information may lead to ethical considerations of how this information could be used.

He began by explaining what he means by intelligence. Intelligence is not knowledge. It is the ability to reason, plan, solve problems, comprehend complex ideas, learn quickly, learn from experience. It is not book learning, or an academic or physical skill, or an ability in test-taking. Rather it reflects a broader and deeper capability for comprehending our surroundings "catching on", "making sense of things", "figuring out what to do", artistic creativity.

As examples that reflect on Humanist principles, he mentioned Copernicus, and later Galileo, who, through intelligence, argued that the earth revolves around the sun, in contradiction to the teachings of the church. Similarly, Darwin, who argued that life evolved from previous forms, also in contradiction to the teachings of the church. He also gave a few examples of how our intelligence has transformed our knowledge of the universe, and the technical developments of the world we live in that derive from the use of our intelligence.

Next, he compared and contrasted inherited behaviour, ie instinctive behaviour, with behaviour that is acquired though our use of intelligence, giving examples of each:

- Inherited behaviour (instinct) is a fixed, invariant behaviour, and only able to change very slowly, through evolution. Examples of human instinctive behaviour include the drives of newborn infants, and the drives behind courtship and procreation.
- We use our intelligence to learn and understand, and to acquire skills, such as academic learning, and workplace skills, and skills such as how to drive a car, operate a laptop etc.

He went on to describe intelligence tests, and to show how intelligence varies in the population. Quantifiable tests of intelligence have been used for 100 years and are reasonably reliable. The distribution of intelligence in a population is the well-known bell-shaped (Gaussian) distribution, where the most common level of intelligence is mid-range, and very few people have either very low or very high intelligence. The question then is whether these differences in intelligence are derived from "nurture" or "nature", that is, whether they derive from our experiences, or from our genetic make-up.

The key to the study of whether intelligence is inherited began with studies of identical and non-identical twins.

- For non identical twins, for a characteristic that is inherited, approximately 50% of pairs will be the same in that characteristic.
- For identical twins, for a characteristic that is inherited, approximately 100% of pairs will be the same in that characteristic.

There were other studies, alongside the studies of twins. All studies indicate that in the Nature vs Nurture debate, nature is by far the dominant force. Substantially, intelligence is inherited, and intelligence cannot be taught. He agreed that not all educators accept this result, but argued that in such cases there may be confusion between the meaning of intelligence and the meaning of knowledge.

He next considered the correlations of intelligence. Intelligence correlates with education and social class. Also with social mobility, health and mortality. We should not be surprised by this because intelligence is used to acquire knowledge, and forms the cornerstone of success in education. As intelligence is inherited, then not only intelligence, but also its material benefit can be passed on. He also said that our choice of marriage partners and other relationships correlates with intelligence, more so than other behavioural or physical traits. [There was discussion on these points in question time, regarding whether these correlations could lead to divisions in the population based on intelligence, or even to a diversion in the evolution of the human race].

He next described the research to try to identify those parts of the genome that carry intelligence. This work is ongoing, and he quoted various research topics, including research which identifies particular genes which are linked with variation in intelligence. He dealt with this particular point in quite some detail. He pointed out the possibility that genetic screening could be used as an indicator of intelligence, for example in job applications, and the ethical considerations implied by this.

The lecture was followed by a lengthy period of questions and discussion