

1. Power companies have given Diels enough money to develop his laser.

Passage: Bernstein says that Diels's system is attracting lots of interest from the power companies. But they have not yet come up with the \$5 million that EPRI says will be needed to develop a commercial system, by making the lasers yet smaller and cheaper. ^

2. Obtaining money to improve the lasers will depend on tests in real storms.

Passage: He reckons that the forthcoming field tests will be the turning point — and he's hoping for good news. Bernstein predicts 'an avalanche of interest and support' if all goes well.

3. Weather forecasters are intensely interested in Diels's system.

Passage: Other scientists could also benefit. With a lightning 'switch' at their fingertips, materials scientists could find out what happens when mighty currents meet matter. Diels also hopes to see the birth of 'interactive meteorology' — not just forecasting the weather but controlling it. If we could discharge clouds, we might affect the weather,' he says.

4. Nineteenth-century studies of the nature of genius failed to take into account the uniqueness of the person's upbringing.

Passage: *In other words, when, for instance, information is collated about early illnesses, methods of upbringing, schooling, etc., we must also take into account information from other historical sources about how common or exceptional these were at the time. For instance, infant mortality was high and life expectancy much shorter than today, home tutoring was common in the families of the nobility and wealthy, bullying and corporal punishment were common at the best independent schools and, for the most part, the cases studied were members of the privileged classes.*

5. Nineteenth-century studies of genius lacked both objectivity and a proper scientific approach.

Passage: *It was only with the growth of pediatrics and psychology in the twentieth century that studies could be carried out on a more objective, if still not always very scientific, basis.*

6. A true genius has general powers capable of excellence in any area

Passage: *There is still much truth in Dr Samuel Johnson's observation, The true genius is a mind of large general powers, accidentally determined to some particular direction'. We may disagree with the 'general', for we doubt if all musicians of genius could have become scientists of genius or vice versa, but there is no doubting the accidental determination which nurtured or triggered their gifts into those channels into which they have poured their powers so successfully.*

7. The skills of ordinary individuals are in essence the same as the skills of prodigies.

Passage: *What we appreciate, enjoy or marvel at in the works of genius or the achievements of prodigies are the manifestations of skills or abilities which are similar to, but so much superior to, our own.*

8. The ease with which truly great ideas are accepted and taken for granted fails to lessen their significance.

Passage: *What we appreciate, enjoy or marvel at in the works of genius or the achievements of prodigies are the manifestations of skills or abilities which are similar to, but so much superior to, our own. But that their minds are not different from our own is demonstrated by the fact that the hard-won discoveries of scientists like Kepler or Einstein become the commonplace knowledge of schoolchildren and the once outrageous shapes and colors of an artist like Paul Klee so soon appear on the fabrics we wear. This does not minimize the supremacy of their achievements, which outstrip our own as the sub-four-minute milers outstrip our jogging.*

9. Giftedness and genius deserve proper scientific research into their true nature so that all talent may be retained for the human race.

Passage: *Genius and giftedness are relative descriptive terms of no real substance. We may, at best, give them some precision by defining them and placing them in a context but, whatever we do, we should never delude*

ourselves into believing that gifted children or geniuses are different from the rest of humanity, save in the degree to which they have developed the performance of their abilities.

10. Geniuses often pay a high price to achieve greatness.

Passage: *We may envy their achievements and fame, but we should also recognise the price they may have paid in terms of perseverance, single-mindedness, dedication, restrictions on their personal lives, the demands upon their energies and time, and how often they had to display great courage to preserve their integrity or to make their way to the top.*

11. To be a genius is worth the high personal cost.

Passage: *The purpose of instruction is to make us even more different from one another, and in the process of being educated, we can learn from the achievements of those more gifted than ourselves. But before we try to emulate geniuses or encourage our children to do so we should note that some of the things we learn from them may prove unpalatable. We may envy*

their achievements and fame, but we should also recognise the price they may have paid in terms of perseverance, single-mindedness, dedication, restrictions on their personal lives, the demands upon their energies and time, and how often they had to display great courage to preserve their integrity or to make their way to the top.

12. The wear and tear theory applies to both artificial objects and biological systems.

Passage: *Our life span is restricted. Everyone accepts this as 'biologically' obvious. 'Nothing lives forever!' However, in this statement, we think of artificially produced, technical objects, products which are subjected to natural wear and tear during use. This leads to the result that at some time or other the object stops working and is unusable ('death' in the biological sense). But are the wear and tear and loss of function of technical objects and the death of living organisms really similar or comparable?*

Our 'dead' products are 'static', closed systems. It is always the basic material which constitutes the object and which, in the natural course of things, is worn down and becomes 'older'. Age, in this case, must occur

according to the laws of physical chemistry and of thermodynamics. Although the same law holds for a living organism, the result of this law is not inexorable in the same way.

13. In principle, it is possible for a biological system to become older without aging.

Passage: *Although the same law holds for a living organism, the result of this law is not inexorable in the same way. At least as long as a biological system has the ability to renew itself it could actually become older without aging; an organism is an open, dynamic system through which new material continuously flows.*

14. Within seven years, about 90 per cent of a human body is replaced as new.

Passage: *Age, in this case, must occur according to the laws of physical chemistry and of thermodynamics. Although the same law holds for a living organism, the result of this law is not inexorable in the same way. At least as*

long as a biological system has the ability to renew itself it could actually become older without aging; an organism is an open, dynamic system through which new material continuously flows. Destruction of old material and formation of new material are thus in permanent dynamic equilibrium. The material of which the organism is formed changes continuously. Thus our bodies continuously exchange old substances for new, just like a spring which more or less maintains its form and movement, but in which the water molecules are always different.

15. Conserving energy may help to extend a human's life.

Passage: *It follows from the above that sparing use of energy reserves should tend to extend life. Extreme high-performance sports may lead to optimal cardiovascular performance, but they quite certainly do not prolong life. Relaxation lowers metabolic rate, as does adequate sleep and in general an equable and balanced personality. Each of us can develop his or her own 'energy saving programme' with a little self-observation, critical self-control and, above all, logical consistency. Experience will show that to live in this*

way not only increases the lifespan but is also very healthy. This final aspect should not be forgotten.