

UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Kedua

Sidang Akademik 1997/98

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HEK 121 Kemahiran Dalam Pembacaan dan Penulisan Bahasa Inggeris

Masa: [3 jam]

THIS EXAMINATION PAPER CONTAINS THREE [3] QUESTIONS IN FOUR [4] PAGES.

Answer all **THREE** [3] questions.

1. Assume that you have been assigned **one of the following topics** for an essay. Prepare
 - [1] a sentence outline, and
 - [2] a topic outline of the topic.
 - [a] The communication revolution in my country: problem or solution?
 - [b] To what extent should a nation's development be measured in material terms? What other aspects of development are important?

[30 marks]

2. Drawing on information from the two articles below, **write a short essay** (not more than 200 words) on the following topic:

What did Professor Durant's surveys reveal about public knowledge of science and scientific method in Britain?

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The gulf between Professor Boffin and Joe Public

Susan Young meets a scientist dedicated to overcoming people's awe - and fear - of science.

THE trouble with scientific education in this country, says Professor John Durant, is that it is geared to producing future researchers and academic high-flyers. What it does not do is produce school-leavers who are scientifically literate, possessing the basic tools of under-standing.

'Most people in this country can read and write, and the reason is because universal education instils the principles into most children. If we are going to have a scientifically literate population - people who can find their way around the world of science in a reasonably competent way - then first and foremost it's the responsibility of schools to instil the basics,' he says. 'The notion of literacy is very relevant. Reading and writing is an enormous asset, but we don't describe someone as literate if they are just deeply familiar with a particular book like *Tom Sawyer*.'

It is something which concerns Durant: indeed, it is his life's work. As Assistant Director of the Science Museum and Imperial College's Professor in the Public Understanding of Science, his job for the past three years has been to work out exactly why there is such an enormous gulf between what tabloids still refer to as 'boffins' and their readers.

The paradox is that in an increasingly technological age we need to be more aware of science - but instead, many people are baffled by it. Few owners of such common place kitchen gadgets as microwaves can explain how they work, and ignorance breeds fear - such as that described by one woman interviewed by Durant who wondered if she shouldn't cook the family meals wearing a lead apron.

One of Durant's surveys, which compared basic scientific knowledge on both sides of the Atlantic, found just 31 per cent of Britons and 43 per cent of Americans knew electrons are smaller than atoms. Almost a third of Britons and almost a quarter of Americans believe antibiotics kill viruses as well as bacteria - despite a far higher interest in matters medical rather than other branches of science among both groups.

Although statistically the average scores of both groups turned out to be similar - 9.26 correct answers out of 15 for the British and 10.02 for the Americans - detailed results were more worrying. The survey, published in 1989, discovered that 34 Britons gave two or fewer correct answers, against only three Americans - and this on a quiz that

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included what the authors described as 'morale-boosting' questions such as 'the centre of the earth is very hot'. At the other end of the scale, 91 Americans but only 11 Britons got top marks.

But Durant does not think rote-learning of yet more scientific 'facts' in schools is the answer.

'The world is a fast-changing place and even people who have stayed at school until 18 will find their knowledge is out of date by the time they are 28. Ten years is a long time in science. The media, museums and so on all play a part in keeping people up to date, but they need the basic grounding.

'School should be a foundation, I think the problem we have still got with the education system in general in this country is that it is geared to the principle of training an elite who are going to become highly skilled or perhaps even professional scientists.

'Compare it with the teaching of music, for instance, and you would be giving all school children the training of concert violinists. An education designed for maximum benefit would be for the understanding of music - musical appreciation, if you like.'

What Durant would like to see children given is a greater understanding of what science is really like, how it works and how it affects everyday life - 'whether eggs contains salmonella or are safe to eat, what happened at Chernobyl and so on'.

Surveying the extent of public ignorance

THE British survey, carried out by John Durant and his colleagues at the University of Exford in 1988, makes gloomy reading, at least at first glance. Not only were many of the people sampled unable to answer some of the questions probing their knowledge of scientific facts, but very few, Durant says, seemed to understand what it means 'to study something scientifically': only 3 per cent of the 2000 people questioned associated science with testing theories, for example.

But less abstract questions revealed that many people did indeed have an idea of what 'scientific method' is meant to be. For example, when respondents were asked to decide between alternative ways in which a doctor might be sure a drug was working, almost two-thirds opted for a comparison between people taking drug and those not taking a drug - the basis of clinical trials.

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Durant also discovered that people were twice as likely to pick the right answer (quoting an experimental comparison) if the question was medical. People faced with a similar question about comparing two metals were more likely to pick the 'wrong' answer, and conclude that the practitioner would rely on a prior knowledge of metals. As Durant says, 'people don't know what metal-lurgists do'.

People are not only more familiar with medicine, but, to the researchers' surprise, they also see it as 'very scientific'. When people were asked to rank different disciplines as more or less rigorously scientific, medicine was given a higher 'scientific' rating even than physics.

When Durant and his colleagues looked more closely at these data they found that those who did better on their factual knowledge ('science understanding' scores) were more likely to discriminate between the disciplines of science. High rating for medicine came predominantly from those whose 'understanding' scores were low.

Beliefs about science in turn owe much to media accounts, and newspapers and TV probably devote more coverage to advances in medicine than to other fields. Jean-Marie Trouve, at the University of Poitiers, argues that, in France at least, the media tend to portray physics and chemistry exclusively through their industrial and technological applications. This might explain the results of his survey, which suggested that many French people see physics and chemistry as technology. The French media portray medicine, on the other hand, as scientific; we can speculate, Trouve suggests, that 'studies of the human body and mind will occupy the vacuum left by hard sciences and become Science par excellence'.

It is easy, too, to misinterpret surveys by assuming that people always act on their professed beliefs. Jon Miller at the Public Opinion Laboratory at the University of Northern Illinois conducted similar surveys for the American National Science Foundation. Disturbing though it seems that more than a third of adult Americans sampled thought astrology to be scientific, few (about 5 per cent) actually used astrological prediction to guide what they did. Yet three-quarters said that they used scientific information from animal testing of drugs and food to change what food or medicines they consumed.

[40 marks]

3. **It has been claimed that reading for understanding demands patience and is time consuming. However, it is possible to take short cuts to locate passages that will repay reading in a systematic way.**

What kind of evidence would you consider to be relevant to confirming or disconfirming such a claim?

[30 marks]

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