

1999-1 Text 5

1- Science, in practice, depends far less on the experiments it prepares than on the preparedness of the minds of the men who watch the experiments.

Sir Isaac Newton supposedly discovered gravity through the fall of an apple.

Apples had been falling in many places for centuries and thousands of people had seen them fall.

But Newton for years had been curious about the cause of the orbital motion of the moon and planets.

What kept them in place?

Why didn't they fall out of the sky?

The fact that the apple fell down toward the earth and not up into the tree answered the question he had been asking himself about those larger fruits of the heavens, the moon and the planets.

2- How many men would have considered the possibility of an apple falling up into the tree?

Newton did because he was not trying to predict anything.

He was *just wondering*.

His mind was ready for the unpredictable.

Unpredictability is part of the essential nature of research.

If you don't have unpredictable things, you don't have research.

Scientists tend to forget this when writing their cut and dried reports for the technical journals, but history is filled with examples of it.

3- In talking to some scientists, particularly younger ones, you might gather the impression that they find the "scientific method" a substitute for imaginative thought.

I've attended research conferences where a scientist has been asked what he thinks about the advisability of continuing a certain experiment.

The scientist has frowned, looked at the graphs, and said "the data are still inconclusive."

"We know that," the men from the budget office have said, "but what do you think? Is it worthwhile going on? What do you think we might expect?"

The scientist has been shocked at having even been asked to speculate.

4- What this amounts to, of course, is that the scientist has become the victim of his own writings.

He has put forward unquestioned claims so consistently that he not only believes them himself, but has convinced industrial and business management that they are true.

If experiments are planned and carried out according to plan as faithfully as the reports in the science journals indicate, then it is perfectly logical for management to expect research to produce results measurable in dollars and cents.

It is entirely reasonable for auditors to believe that scientists who know exactly where they are going and how they will get there should not be distracted by the necessity of keeping one eye on the cash register while the other eye is on the microscope.

Nor, if regularity and conformity to a standard pattern are as desirable to the scientist as the writing of his papers would appear to reflect, is management to be blamed for discriminating against the “odd balls” among researchers in favor of more conventional thinkers who “work well with the team.”

27. The author wants to prove with the example of Isaac Newton that _____.

- [A] inquiring minds are more important than scientific experiments
- [B] science advances when fruitful researches are conducted
- [C] scientists seldom forget the essential nature of research
- [D] unpredictability weighs less than prediction in scientific research

28. The author asserts that scientists _____.

- [A] shouldn't replace "scientific method" with imaginative thought
- [B] shouldn't neglect to speculate on unpredictable things
- [C] should write more concise reports for technical journals
- [D] should be confident about their research findings

29. It seems that some young scientists _____.

- [A] have a keen interest in prediction
- [B] often speculate on the future
- [C] think highly of creative thinking
- [D] stick to "scientific method"

30. The author implies that the results of scientific research _____.

- [A] may not be as profitable as they are expected
- [B] can be measured in dollars and cents
- [C] rely on conformity to a standard pattern
- [D] are mostly underestimated by management