**1999-Text 5**

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? ①The 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.

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. ②Scientists tend to forget this when writing their cut and dried reports for the technical journals, but history is filled with examples of it.

③In talking to some scientists, particularly younger ones, you might **gather** the **impression** that they find the “scientific method” a **substitute** for **imaginative** thought. ④I’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**.

⑤What this **amounts** to, of course, is that the scientist has become the **victim** of his own writings. ⑥He 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. ⑦It 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”.