

Book Reviews

ALEXANDER KOHN, *Fortune or failure: missed opportunities and chance discoveries in science*, Oxford, Basil Blackwell, 1989, 8vo, pp. x, 199, illus., £14.95.

Poor Aristotle: what opportunities he missed! If only he had applied that marvellous mind to making his ideas about motion more quantitative he would have spotted the contradiction in his ideas about falling bodies. Better still, he could have dropped bodies from towers. Or yet again, timed a pendulum. And how many more fine minds missed these wonderful opportunities before they were, at last, taken up by Galileo. This book recounts missed opportunities with that most unreliable of instruments—hindsight. Of course, Aristotle is not one of those listed, but he would certainly fit in with the author's general thesis of "If only X had seen Y . . .". On the other side of this strange conception of science is the focus on chance, in the guise of serendipity.

Serendipity here, is defined as the "faculty of making happy and unexpected discoveries in the course of scientific investigation". But since the nature of scientific investigation is to make a new discovery this definition is circular. The term is really used in its original meaning—making discoveries of "things which they were not in quest of". With this definition it would have been serendipitous if John McEnroe had discovered penicillin while playing tennis. In Fleming's case, the term is not apposite. For there are innumerable chance events that contribute to a scientist's life. That Fleming should have been born at all, that he should have studied medicine, become a bacteriologist, involves far more chance events than the mould appearing on his plate. He was, after all, devoted to the search for a means of combating bacterial infections. (Even so, as the author points out, it is something of a puzzle that he did not pursue the possibility of clinical application. The suggested cause is that the department in which he worked was antipathetic to such an approach.)

Numerous accounts of "missed opportunities" and "serendipity" are given and as stories they can make interesting reading. But it is far from clear just what point the author is making, other than that the good scientist doesn't miss the opportunities. It is always striking how "lucky" the great scientists are. As Pasteur remarked, I am sure with some irony, "fortune favours the prepared mind".

The case of the discovery of radioactivity by Henri Becquerel again illustrates the point. He was interested in luminescence, which he thought was related to X-rays. Becquerel's discovery was based on his investigation of uranium salts which would blacken a photographic plate when exposed, so he thought, to sunlight. When, however, after several sunless days he developed a plate and found it nevertheless blackened, he realized, at once, that the uranium was emitting something spontaneously. The author sees this as a happy accidental discovery due to his developing plates not exposed to sunlight, apparently unaware that this is an obvious control experiment that any good scientist should do.

It is of course interesting that tranquillizers were discovered during the screening of anti-bacterial agents—one compound, observed to paralyse the mice, was acting as a muscle relaxant—and that anaphylaxis came from a study on the toxins produced by the Portuguese man-of-war. Testing the compounds on dogs it was found that a second dose given to dogs who had already survived one dose caused a surprising and fatal reaction. Other accounts deal with, for example, insulin, vitamins, puerperal fever, antibiotics, endorphins, and radioimmunoassay. These make entertaining, if irritating, reading.

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GEOFFREY TWEEDALE, *At the sign of the plough: 275 years of Allen & Hanburys and the British pharmaceutical industry 1715–1990*, London, John Murray, 1990, 8vo, pp. 264, illus., £17.95.

In this book Geoffrey Tweedale traces the history of one of the oldest pharmaceutical houses—Allen & Hanburys Ltd—in the wider context of the British pharmaceutical industry. The history of the firm falls into four main phases. The earliest runs from its foundation in 1715 by a Welsh Quaker, Silvanus Bevan, who established an apothecary's shop in Plough Court, off Lombard Street in the City of London, dispensing medieval plant medicines. There are interesting accounts of the early partners, including the famous Quaker William Allen, who