Valiela, I.: Doing Science. Design, Analysis, and Communication of Scientific Research. – Oxford University Press, New York 2001. ISBN 0-19-507962-0 (hard bound), 0-19-513413-3 (paperback). 294 pp., GBP 55.00 (HB), GBP 29.50 (PB).

Preparing students for eventual scientific career is one of the most needed teaching topics at every university. Unfortunately, not at all schools students are persuaded to take courses in the direction of philosophy of science, research design and making experiments, and scientific communication. The shortage in this tutorial direction is often reflected throughout the future scientific life of such students. To help in improving this state is the intention of the reviewed book. Its author works in the Marine Biological Laboratory at Woods Hole, MA, USA, and teaches in the frame of the Boston University Marine Program. This explains why many examples in his book are in the field of biological sciences and often deal with environment.

The text is divided into eleven chapters. The first one (Obtaining Scientific Information) explains the differences of empirical and deductive science, observation *vs.* experimentation, description *vs.* manipulative experiments, and correlational *vs.* comparative observations, stresses the importance of connecting basic and applied science, mentions the proper and improper use of models as education tools and experimental bases, *etc.* Chapter 2 is on elements of scientific data and tests of questions. The author explains the difference of accuracy and precision, deals with frequency distributions, data transformations, tests of hypotheses, *etc.* Chapter 3 is on statistical analyses and their importance in doing science. The introductory motto is that of S.S. Stevens: "Where measurement is noisy, uncertain, and difficult, it is only natural that statistics should flourish." Special attention is given to different types of analysis of variance, regression and correlation analysis, analysis of frequencies (frequentist *vs.* Bayesian statistics), transformations and graphical analysis of values, *etc.* Very vivid is Fig. 3.5 that shows how the same values give different graphic expression when linear, logarithmic, square root, or reciprocal transformations are used. Chapter 4 is on principles of research design, *i.e.*, the design of treatments, layout, and expected response.

The following six chapters are on scientific communication. The first topic is writing. The chapter 5 deals with the increase in number of scientific papers from the 17th century till the end of 20th century, why English is the new *lingua franca*, and with some basics of scientific English (word use, jargon, inaccurate word use – pp. 110-111, excess words, sentence and paragraph structure, *etc.*) Interesting is the comparison of six versions of one text passage (p. 123). Chapter 6 is on the organisation of a scientific paper. The contents and importance of its basic parts, and the life history of a paper are explained here. Added are the list and an example of use of editorial marks. Chapter 7 is dedicated to preparation and presentation of scientific talks (with good tips for speakers on pp. 150-152, and evaluation of use of visuals in talks), posters, and grant proposals for various agencies, philanthropic foundations, and business and industrial organisations. How to present data in tables is explained in chapter 8 (elements and layout of tables). Part 8.4 (Tables that need not be tables) is an important warning for many science novices. How to present data in figures is the topic of chapter 9: Some for biology rather rare kinds of figures (contour plots, triangular graphs, rose diagrams, modifications of bar graphs) are shown in this very useful chapter. The topic continues in the next chapter that evaluates proper and improper choices of graphical presentation. Graphs that could be tables, that are hard to decipher and interpret, that waste space, that are overdone, pseudo three-dimensional graphical settings, bar graphs masquerading as something else, *etc.* are shown here in clear examples.

The final chapter is on current perceptions and criticisms of science. Case histories of three phantom risks (fluoridation of drinking water, exposure to low-level electromagnetic radiation, ocean wastewater disposal) are evaluated, as well as the question of modern critics of science. Attention is paid to misdirections of science, induced by untrustworthy data or purposeful hoaxes. Critical examination of evidence as well as respecting ethical principles should always be stressed.

The text is comprehensive; the author gives some humorous examples, and presents a balanced selection of well-chosen illustrations. The breadth of the columns is only about three-quarters of each page, which forced the publisher to use a rather small size of letters. The left and right margins of pages are used for headings to figures and tables, mottoes, and comments. Important summaries are presented in inserted vignettes. All chapters (but one, chapter 10) are complemented with lists of references for further reading (5 to 32 items, usually half of them are to books and half to articles in newspapers and scientific journals). The index (10 pp.) contains all necessary items. I recommend this book as a textbook to courses in universities all over the world.

Nevertheless, I would like to comment the present praxis of some publishing houses. Thus the branch of the Oxford University Press in New York published the reviewed book. Nevertheless, the top part of p. IV gives 33 places of branches of the Oxford University Press that should theoretically be cited in references. What is the sense of this praxis?

Z. ŠESTÁK (*Praha*)