

# 9. Honesty is the best policy

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surgeon to know his tools. Euclid can be explained in bad grammar and bad diction, and a vermiform appendix can be removed with a rusty pocket knife, but the victim, even if he is unconscious of the reason for his discomfort, would surely prefer better treatment than that.

All mathematicians, even very young students very near the beginning of their mathematical learning, know that mathematics has a language of its own (in fact it is one), and an author must have thorough mastery of the grammar and vocabulary of that language as well as of the vernacular. There is no Berlitz course for the language of mathematics; apparently the only way to learn it is to live with it for years. What follows is not, it cannot be, a mathematical analogue of Fowler, Roget, and Webster, but it may perhaps serve to indicate a dozen or two of the thousands of items that those analogues would contain.

## 9. HONESTY IS THE BEST POLICY

The purpose of using good mathematical language is, of course, to make the understanding of the subject easy for the reader, and perhaps even pleasant. The style should be good not in the sense of flashy brilliance, but good in the sense of perfect unobtrusiveness. The purpose is to smooth the reader's way, to anticipate his difficulties and to forestall them. Clarity is what's wanted, not pedantry; understanding, not fuss.

The emphasis in the preceding paragraph, while perhaps necessary, might seem to point in an undesirable direction, and I hasten to correct a possible misinterpretation. While avoiding pedantry and fuss, I do not want to avoid rigor and precision; I believe that these aims are reconcilable. I do not mean to advise a young author to be ever so slightly but very very cleverly dishonest and to gloss over difficulties. Sometimes, for instance, there may be no better way to get a result than a cumbersome computation. In that case it is the author's duty to carry it out, in public; the best he can do to alleviate it is to extend his sympathy to the reader by some phrase such as "unfortunately the only known proof is the following cumbersome computation".

Here is the sort of thing I mean by less than complete honesty. At a certain point, having proudly proved a proposition  $p$ , you feel moved to say: "Note, however, that  $p$  does not imply  $q$ ", and then, thinking that you've done a good expository job, go happily on to other things. Your motives may be perfectly pure, but the reader may feel cheated just the same. If he knew all about the subject, he wouldn't be reading you; for him the non-

implication is, quite likely, unsupported. Is it obvious? (Say so.) Will a counterexample be supplied later? (Promise it now.) Is it a standard but for present purposes irrelevant part of the literature? (Give a reference.) Or, *horribile dictu*, do you merely mean that you have tried to derive  $q$  from  $p$ , you failed, and you don't in fact know whether  $p$  implies  $q$ ? (Confess immediately!) In any event: take the reader into your confidence.

There is nothing wrong with the often derided “obvious” and “easy to see”, but there are certain minimal rules to their use. Surely when you wrote that something was obvious, you thought it was. When, a month, or two months, or six months later, you picked up the manuscript and re-read it, did you still think that that something was obvious? (A few months' ripening always improves manuscripts.) When you explained it to a friend, or to a seminar, was the something at issue accepted as obvious? (Or did someone question it and subside, muttering, when you reassured him? Did your assurance consist of demonstration or intimidation?) The obvious answers to these rhetorical questions are among the rules that should control the use of “obvious”. There is another rule, the major one, and everybody knows it, the one whose violation is the most frequent source of mathematical error: make sure that the “obvious” is true.

It should go without saying that you are not setting out to hide facts from the reader; you are writing to uncover them. What I am saying now is that you should not hide the status of your statements and your attitude toward them either. Whenever you tell him something, tell him where it stands: this has been proved, that hasn't, this will be proved, that won't. Emphasize the important and minimize the trivial. There are many good reasons for making obvious statements every now and then; the reason for saying that they are obvious is to put them in proper perspective for the uninitiate. Even if your saying so makes an occasional reader angry at you, a good purpose is served by your telling him how you view the matter. But, of course, you must obey the rules. Don't let the reader down; he wants to believe in you. Pretentiousness, bluff, and concealment may not get caught out immediately, but most readers will soon sense that there is something wrong, and they will blame neither the facts nor themselves, but, quite properly, the author. Complete honesty makes for greatest clarity.

## 10. DOWN WITH THE IRRELEVANT AND THE TRIVIAL

Sometimes a proposition can be so obvious that it needn't even be called obvious and still the sentence that announces it is bad exposition, bad