scribed, from the United States during that period." (In M. L. Britton and A. Brown, *Illustrated Flora Northern United States, Canada . . . ,* 2nd ed., 294 [1913]). In 1935 L. H. Bailey noted that *Rubus* is "a most variable and perplexing genus, containing perhaps 400 fairly well-marked species and numberless intermediate forms. More than 3,000 species-names have been applied" (*Standard Cyclopedia of Horticulture,* 2nd ed., 3021 [1935]). And the same author, writing of *Rosa,* commented: "While some, as Bentham and Hooker, estimate the number [of species] at about 30, the French botanist Gandoger actually describes from Eu. and W. Asia alone 4,266 species" (*op. cit.,* 2981). Such splitting is not restricted to the genera mentioned; witness also *Iris, Viola,* and *Aster,* and it is not unknown in classification of the animal kingdom.

Contrast the figures cited with those for Linnaean species of those genera in 1753, which were: *Crataegus,* 9; *Rubus,* 10; and *Rosa,* 12. And consider what chance there is that a given name could have had the same content through subsequent time and all the upheavals indicated. The conclusion from this line of thought is that few, if any, names can have kept anything like the same meaning. Hence, so far as aiding in defining distribution, illustrating life history, or making any other practical use of the names is concerned, the literature would have no clearer significance than if the names had differed as often as the concepts shifted.

As names have not had the same meaning throughout their history, reliance upon a system of stable nomenclature compounds illusion. It is clear that the concepts embraced by the names may change with every revision, with every advance in taxonomic science. To have a really stable nomenclature would require a static classification—something that is both impossible and undesirable.

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On Scientific Reviewing and Writing

YOUR issue of April 18, 1952 on books is very welcome and, if I may follow the precept enunciated later, broadly sound; but there are other aspects to some of the issues raised, and these will repay discussion.

Scientific book criticism has two distinct functions that can, fortunately, be pursued simultaneously. First, the review should make clear whether the book is worth reading or buying. If the reviewer's name is well enough known in the subject, he need do little more than make a bald statement and then get on to writing about some related themes that interest him. Second, the review should discuss the subject, partly to show why the reviewer holds the views he does about the book, and partly because reading the book reviews should be a method of maintaining some acquaintance with sciences other than one's own. There is no advantage in pointing out errors in a good book; anyone capable of writing a good book will respond to a private letter in preparing a second edition. In a mediocre book it is generally worth while to explain what the deficiencies are; essentially, a mediocre book is one that would be good if it were modified a little. With a bad book errors need not be gone into in detail; the more outrageous, especially if comic, should be quoted, and that is all. The basic precept is that a review should leave the reader in no doubt whether the book is good, is marred by a few correctible defects, or stinks.

Dr. Bates suggests that reviewers should be younger, and that reviewing is a cheap, easy way to build up a library. I doubt it. However clear a review may be, its readers must take a great deal on trust, and the reputation of the reviewer matters. Furthermore, scientists not in permanent jobs naturally hesitate to be frank about a bad book by an author who is still influential. The unsigned review gets around this difficulty, but an unsigned critical review has little value unless it is very long. Expensive as books are, conscientious reading for review takes up an amount of time that, had it been spent coaching, examining, or even dishwashing, would bring in enough money for normal purchase. Thoughtful people do not review for economic motives; they have a variety of other motives—some of which may be less commendable.

The attempts of scientists to write popularly are rightly criticized by Frank Carey, but do journalists manage the business any better? Scientists use long and unusual words out of habit and thoughtlessness; journalists use them for effect. Each is wrong, but the error, as soon as it is realized, may be corrected. Slang is almost always a mistake, because it is ambiguous. A few lines back I used the word "stinks," but its ambiguity did not matter there, because all the possible meanings are suitably derogatory. But a light appearance should not be achieved at the expense of meaning, and in one or two places in his article Carey seems thus to have achieved it. The main contrast between the writing of a journalist and that of a good scientist seems to be that the former assumes only about a third of what he writes will be read. He therefore tends to use standard, easily recognized phrases instead of single words, and to repeat. The number of ideas contained in 1000 words is thus smaller than the number in a paper by a scientist. The scientist, on the other hand, tends to cover too much ground in an article and to put in too much detail. It would be better if scientists made their popular articles shorter, but the basic idea, that an article should be read rather than skimmed, is sound. If this were done, the digests would probably be put out of business, but this would not necessarily be a misfortune. The important thing is that working scientists should be encouraged to write for the general public. The effort educates the scientist, and the reader gets something different from his usual fare and something at least as good.

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A SERIOUS omission in Dr. Bates' article on "The Criticism of Scientific Books" (SCIENCE, **115**, 407 [1952]) is the important contribution of libraries to the publicizing of books.

Although approving Dr. Bates' suggestion that a journal such as SCIENCE should develop its book reviewing department to a greater extent, I feel that a better answer to the problem of keeping informed of new publications in science and other fields of knowledge is by continued use of the library. One visit by a general or specialized reader to a progressive public, university, or special library will convince him that libraries are no longer keepers of books, but rather promoters of books. Such a visit will very likely provide the book itself, many reviews of the book, and other material on the same subject.

I believe, also, that Dr. Bates is overly harsh in his opinion of the quality of book reviews. At least one exception to his statement that "all books on science get about the same treatment . . ." is the title *The Atom at Work,* by Jacob Sacks. This volume was selected by R. R. Hawkins, head, Science and Technology Department, New York Public Library, as one of the 100 essential technical books of 1950–51 (*Library J.,* **76**, 811 [1951]).

Nine reviews of this book were written by science librarians, scientists, and a science editor, as well as an unsigned review appearing in the *Saturday Review of Literature.* Certainly this is excellent coverage of a good book by a variety of qualified reviewers. Not one of the nine reviews mentioned "faulty documentation," "misprints," or "howlers." One review mentioned the index—not as "inadequate" but as "good."

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Book Reviews

King Solomon's Ring: New Light on Animal Ways. Konrad Z. Lorenz; trans. from the German by Marjorie Kerr Wilson. New York: Crowell, 1952. 202 pp. $3.50.

Only rarely does one encounter a book such as this. Konrad Lorenz is one of the world's outstanding naturalists, and here we have evidence that he is also an excellent narrator. Other men have learned to know certain species of animals as well as Lorenz knows his jackdaws, graylag geese, or ravens—you can find their reports in various technical journals—but the fact that Lorenz is a missionary of natural history sets him apart. He likes animals for what they are and he candidly states that this book is aimed at leading others to learn to like them.

With infinite patience, Lorenz has "kept" colonies of free-flying birds, an aquarium housing water shrews, and numerous other animals. His observations have been keen, and his descriptions comprehensive. He has successfully resisted the many temptations to anthropomorphize and yet he makes the reader aware of the mental and physical individuality of his subjects. After reading the chapter recording his 25 years with "The Perennial Retainers"—his jackdaws—you feel that you know them, as individuals and as a species.

There are times when Dr. Lorenz seems to generalize somewhat more than he should. His dismissal of the golden eagle as an "extremely stupid" creature, apparently on the basis of a single imperial eagle which he bought from a wandering menagerie, seems overly harsh. Certainly he demonstrates individual differences among other groups that he studied. These are but minor lapses, however.

In a way, this is a book of instruction. Dr. Lorenz lectures us, subtly, on morals, on pity, on laughter, all with animals as examples. His chapters on "Animals as a Nuisance," "Poor Fish," "Laughing at Animals," "Pitying Animals," and "Buying Animals" are all directed toward improving our relations with animals and, indirectly, with our fellow-men.

The title, based on the charming bit of folklore which supposed that Solomon talked to the animals, may result in some loss of readership, since it is rather abstruse. On the other hand, it may gain converts, since this is a book that, once picked up, is difficult to put down.

Julian Huxley's foreword is excellent, as might be expected. Marjorie Kerr Wilson's translation is smooth and unobtrusive. The illustrative sketches, which apparently are the author's, are both amusing and enlightening. I recommend the book to everyone.

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Miscellaneous Physical and Chemical Techniques of the Los Alamos Project: Experimental Techniques. Alvin C. Graves and Darol K. Froman, Eds. New York–London: McGraw-Hill, 1952. 323 pp. $4.00.

The third volume from Division 5 (Los Alamos) in the National Nuclear Energy series is a collection of miscellaneous physical and chemical techniques used in the early phases of the atomic energy project and originally collected as a laboratory manual for new personnel on the project. It was written by a group of 18 authors. The contents should be of especial interest to those working in nuclear physics with high energy machines: cyclotrons, van de Graaf generators, etc.

To give an idea of the scope of the book it is necessary to outline the contents of the six chapters. The