More on writing

Y. Kirsh and R. Chen

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letters

tice among good referees, and the point
I am making here is that they should be
made mandatory for all.

To begin, it seems to me that certain
(many?) of the judgments made by re-
feerees should be supported by (compul-
sory) physical evidence. For example,
if a referee wishes to claim that the
work under scrutiny is not original,
then he should be required to cite a
reference to the earlier work. If a re-
feeree cannot recall where he saw a
piece of work before, how can he be sure
it is, indeed, identical? Yet, on a num-
ber of occasions editors have seen fit to
pass on such comments to me.

Contradictory instructions are also
sometimes sent on to an author. For
example, one reviewer may request
reduction while a second reviewer de-
mands elaboration of the very same
point. I have had several editors re-
quest that I revise a manuscript to take
both such (and other) disparate views
into account. I have never known how
to proceed in such a revision. It seems
to me that editors could, in clear con-
science, be prohibited from resorting to
such mindless acts of xerography.

There are, of course, those times
when your paper is rejected and a
nearly identical one is subsequently
accepted by the same journal. (I will
cite specific examples if anyone would
like to have them, but for now I do not
choose to single out any particular
journals or editors.) To deal with this
all-too-common complaint a permanent
board could be established to compare
(upon the request of an author) rejected
manuscripts (a copy of which is re-
tained by each editor) against recently
published ones. If the manuscripts are
judged to be "nearly identical" in con-
tent, then the rejected work would be
published under its original submission
date.

I am sure that numerous other rules
can be suggested by our community
and taken as a foundation for a future
"refereeing/editorial law."

R. Jones
National University of Singapore
Kent Ridge, Singapore

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More on writing

As authors who have succeeded in writ-
ing a 360-page book1 as a part-time
project in two years, and who remain
reasonably balanced (we hope), we
found the suggestions of Oliver C. Wells
on "How to write a book" (June 1981,
page 9) most interesting. We would
like to add a few remarks based on our
own experience.

The first step, in our opinion, too, is
to gather as many publications on the
subject as you can lay your hands on
and classify them according to the
chapters you have in mind. The com-
paratively short time we devoted to
the work is due mainly to the fact that we
used a treasure of papers that had been
collected and classified over ten years.
One must, of course, continue looking
for updated references during the
whole period of writing.

As the next step, we would suggest
writing down preliminary yet detailed
contents, including the titles of the
chapters and sections and a short de-
scription of each. Thus you are able to
see the whole picture from the very
beginning of your work. On the other
hand, you should remain flexible
enough to make changes during the
later stages, if necessary.

The third step should be to sit down
at your desk and being the actual
writing. However, we strongly recom-
mand that you not do this until you
have a signed contract with a publish-
ing house. It is most frustrating to
dedicate years to the enterprise just to
find out at the end that you cannot find
a publisher. For professional books
most publishers are ready to give a
definite answer—a contract or a rejec-
tion—based upon the detailed contents
and perhaps one sample chapter. You
may be asked to provide further infor-
mation concerning the potential audi-
ence, comparison with existing books,
the possibility of using your work as
a textbook for graduate or undergra-
duate students, the anticipated length
of the book (number of words and illus-
trations) as well as details of your own
experience and status in the field. In-
cluding this information in your first
application may expedite the process.

An important decision you have to
make at this stage is whether to corre-
spond with the publishers in series or
in parallel. In other words, should you
write to one publisher, wait weeks or
months for his reply, and then—in case
of rejection—write to the next one, or
should you send letters simultaneously
to several publishers? The two main
flaws of the first technique is that the
process may be quite long and frustrat-
ing and you can never be sure that you
have gotten the best offer (there may be
large differences between contracts of-
fered by different publishers). Our sug-
gestion is to write to several publishers
simultaneously, using a less binding
style; do not write: "I would like my
book to be published by your distin-
guished company," but rather some-
thing like: "I would like to check the
possibilities of having my book pub-
lished." We sent letters to nine pub-
lishers, got five answers of the type
"your proposal is under consideration"
and finally received two contracts from
which we picked which seemed to us to
be the better one.

A publisher may inform you that,
due to the limited audience your highly
specialized book may appeal to, the sky-
high costs of printing and so on, he can
publish your book only if you provide
clean camera-ready typescripts that
will be reproduced in their original
form (some publishers might be willing,
in this case, to cover your costs of
typing). Besides the obvious limita-
tions of this method regarding the final
form of the book, it also has some
advantages: The process of preparing
the book may be much faster and it will
be easier to correct errors and to insert
up-to-date supplements. These points
should be considered in case you can
choose between this method and regu-
lar typesetting.

Once you get to the stage of the
actual writing, set a timetable with a
deadline to each chapter, and try to
stick to it. If possible, dedicate two or
three days a week, from morning to
night, to the book. In addition make it
a habit to write at least a few lines each
day to keep the momentum.

If the book is written as a collabora-
tion of two or more authors, it is a good
idea to apportion the planned chapters
among the participants. Each chapter,
after its completion, should be read by
all of you, but the person who has
written the first draft should have the
final say concerning the last version.
A weekly meeting of all the authors,
to discuss current problems and difficul-
ties, may be very advantageous. We
have found that, for several reasons,
the time and effort required by each of
two authors may be much less than half
the time and effort that would be re-
quired if one of them writes the book by
himself; you write faster having a par-
tner who reminds you of your time-
table; it is easier to make decisions
knowing that someone else is going to
read the manuscript and share respon-
sibility; when stuck with a problematic
paragraph it is heartening to have
someone who may help pull you out;
and last but not least, each of the
authors has, naturally, his own fields
of interest within the variety of subjects
included in the book, and the cooper-
ation is very likely to yield a broader
view. The value of the collaboration
is obvious in the proofreading stage; it is
very unlikely that one person, careful
and hawk-eyed as he may be, would be
able to find all the errors; thus it is
important that in this stage each of the
authors read the whole book indepen-
dently.

Be careful not to make your book an
extended review article or a literature
survey. Telling that Adirovitch has
used this method and Bellington has
demonstrated that method, or that
Ting developed one model and Tong
suggested another one, leaves the read-
er in the dark regarding the question of
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what method or model he should use for his own purposes. Most of your readers will be less anxious to know how people in the past have struggled than to understand what they can do here and now. (We are grateful to H. K. Henisch from Pennsylvania State University for his comments on this point as well as other matters pertaining to the writing). You should be the reader's guide in the labyrinth of conflicting techniques and results, using to this end your best experience and seasoned judgment, and being selective and critical without being offensive.

Strive to make your book an image of the present state-of-the-art of the field, without neglecting to mention alternative routes and options that may be of importance in the future. A book that stands the test of time is one that serves as a guide to future research as well as to the present.

To conduct the reader safety through the maze of published results, use diagrams, graphs, flow charts and so on whenever you can. Use these graphic presentations to compare between different models or techniques and to demonstrate their dependence on various parameters. Numerical data should be compiled into tables whenever possible; this way they can be used much more efficiently than if they are scattered throughout the text.

Insert summaries and synopsis not only at the end of chapters or sections but whenever you feel that the reader deserves to be taken by the hand and told where he is now, where he is going to go, and where he has just been. Don't be thrifty on sub-headings; they serve to break the material into smaller chunks that can be more easily digested.

Your book is almost finished. The temptation is great to hurry up now, complete the work, send it on its way and go to the beach. But be patient; this is the time to read it once more from the viewpoint of the user rather than the writer, to make it more readable and clearer to the newcomer and to do final linguistic polishing. Remember that this may be your last opportunity to make improvements and corrections to do it in the second edition is less effective, since the most important readers have already been "creamed off".

Your book is really finished—printed and bound. Don't rest on your laurels yet. Think of possible contributions to sales promotion. For example, make a list of potential buyers and send it to your publisher; tell him to whom he should send free copies, to whom he should send advertisement brochures, and which journals to advertise. Most of the publishers will willingly accept such suggestions; after all, at this moment no one knows the market better than you do.

Reference

Y. Kirsh
Eveymans University
Tel-Aviv, Israel

R. Chen
Tel-Aviv University
Tel-Aviv, Israel

Franken article

Having enjoyed so much Peter Franken's delightful review of recent progress in optics (November, page 160), I cannot resist noting that the remarkable ability of man to recognize patterns was recorded by Moses (Genesis 2:19-20), probably a millenium before Socrates, when Moses described Adam naming the animals.

JOHN A. McINTYRE
Texas A&M University
College Station, Texas

2/82

Laser gyro history

An excellent discussion of the current status of fiber-optic gyroscopes and a brief discussion of the commercially available ring laser gyro were given in October (page 20). It seems that as a device nears commercial use, the early history is of little interest to most of us. At the same time this early history becomes of considerable interest to those few involved in patent litigation. Since I was involved in this early history, I will give a brief and biased account.

Over twenty years ago while I was consulting for Space Technology Laboratories, the concept occurred to me that the degeneracy between clockwise and counterclockwise traveling waves in a resonant electromagnetic cavity would be removed by rotation, and that the frequency difference could be used to measure angular rotation. A disclosure of invention was filed on 7 October 1959 and a more detailed report made available in the STL library for military and space contractors. This disclosure included coiled waveguides as an improvement on the Sagnac interferometer measurement as well as the entirely new concept of using a resonant cavity to measure rotation. Since Physical Review Letters was not enthusiastic about either a Sagnac experiment with matter waves or the measurement of rotation with an electromagnetic cavity, these ideas were presented at the January 1961 meeting of the American Physical Society in New York. The comment of the referee that the resonant cavity concept was "interesting if true" gives an indication of the evaluation of this new idea. It was noted in the talk that the difference in angular frequency in a toroidal cavity with a path of m wavelengths is mπ, and a listener referred to this phenomenon as the "Coriolis-zeeman effect for a photon." This listener may have been A. M. Sutton of the Kollman Instrument Corp., who subsequently expressed his interest in a letter.

A proposal was submitted in March 1961 to the Air Force Office of Scientific Research, the National Aeronautics and Space Administration, and the Office of Naval Research for the development of a cavity with a negative resistance, such as a maser, as a device for the measurement of rotation. Even coiled light pipes and optical masers were included for study. A supplementary proposal in January 1962 proposed in more detail a resonant four-mirror gyro with laser gain. These proposals were rejected and P. K. Cheo and I began construction of a gyro of this design at Ohio State University. A. H. Rosenthal of Kollman described a similar gyro in a paper which was submitted in October 1961 to the Journal of the Optical Society of America and published a year later. The first operating laser gyro of this design was reported in February 1963 by W. Macek and co-workers at Sperry Gyroscope in a post-deadline paper at the Third International Quantum Electronics Conference in Paris. After this successful demonstration, support and interest increased. Very important problems such as "lock in" of the degenerate modes remained to be recognized solved.

The commercial development of the present laser gyro owes much to the intense belief during the ensuing years by persons such as J. Killpatrick of Honeywell that the laser gyro could become a useful device.

Since I am collecting historical material regarding the laser gyro and fiber-optic gyro, I would appreciate receiving current and historical information from readers.

References

C. V. HEER
Ohio State University
Columbus, Ohio

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