# BOOKS & JOURNALS
## A SPECIAL REPORT

It is difficult to tell in these times whether physics books outdo physics journals in their rate of proliferation or whether it is vice versa. This late-summer special report is designed to help physicists catch up in both of these areas before we all return to our overcrowded schedules in the Fall.—The Editors

# WRITING SCIENCE FOR THE PUBLIC

As physics becomes more and more specialized, interpretation for the public becomes close to impossible; a professional journalist explains how he meets this challenge.

Walter Sullivan

As WRITERS for general and scholastic audiences are discovering, young people today are more alert to scientific developments than ever before, whereas their elders in many cases have an utterly defeatist attitude. How tired are science writers of effusive, middle-aged ladies who, trying to be kind, say: "What a fascinating job you have—of course I don't understand what you write about but . . ."

Such attitudes are an indication of past failures in education, and although as noted, today's young minds are better equipped to confront scientific ideas, it would appear that the current hostility to science demonstrates continuing failure of the educational process, be it in the schools or in the efforts of science writers to put across the high adventure that is basic research. The discovery, either in the laboratory or the classroom, that there is order and logic in the seeming randomness of nature can be a quasireligious experience. There is great beauty to be found there, and the successful teachers and writers are those who, having glimpsed it, are driven to share it with others.

Covering physics is therefore a challenge to the journalist, whether or not he is trained in the subject. René Du-

Walter Sullivan has often been honored for his reporting of research news; last year, for example, he won the American Institute of Physics–US Steel Foundation science-writing award. Now science editor of *The New York Times*, Sullivan joined the paper as a copy boy and became a foreign correspondent. He has participated in several polar expeditions, headed *Times* coverage of the International Geophysical Year and was a coauthor of *Project Apollo*, a report originally published in the *Times*.

bos of Rockefeller University, tells, in his book on Louis Pasteur, of an episode that demonstrates dramatically the changes in the nature of science that have taken place during the past century. Pasteur gave a lecture on the evening of 7 April 1864, at the climax of his debate with Felix Pouchet on the appearance of bacteria in media that begin to ferment. Pouchet said the bacteria arose spontaneously. Pasteur argued, successfully, that such spontaneous generation of life could not occur on earth (in its present condition).

Dubos's point is that the scientific arguments of that day were simple enough to be followed by any intelligent listener. The intelligentsia of Europe were caught up in the debate, and they flocked to the Sorbonne to hear Pasteur state his case. In the audience were Georges Sand, the novelist, Alexandre Dumas, inventor of the three musketeers, and many other artists, aristocrats and scientists. They listened intently as Pasteur presented his arguments.

Today it is very different. In Dubos's words:

> "The great pageant of science is still unfolding; but now, hidden behind drawn curtains, it is without audience and understandable only to the players. At the stage door, a few talkative and misinformed charlatans sell to the public crude imitations of the great rites. The world is promised cheap miracles, but no longer participates in the great mysteries."

Perhaps this is a little hard on science writers and others who stand near the door of the temple of science and peddle their wares, but his basic point is undeniable. Few could follow a debate, for example, on the relative merits of Murray Gell-Mann's "eightfold way" and Geoffrey Chew's "bootstrap theory."

Even in the few years that I have been concerned with the coverage of science, the approach to the problem has, perforce, changed. A decade ago it was still possible to scan key journals, such as *Physical Review Letters*, that were likely to report important new developments. Now, with something like 100 journals flowing into the office, one must rely more on someone else to spot the news—a science writer at the American Institute of Physics, for example, who scans the physics journals and prepares press releases, or the press office of a university or industrial research laboratory.

This dependence is unsatisfactory, because it delegates the basic selection

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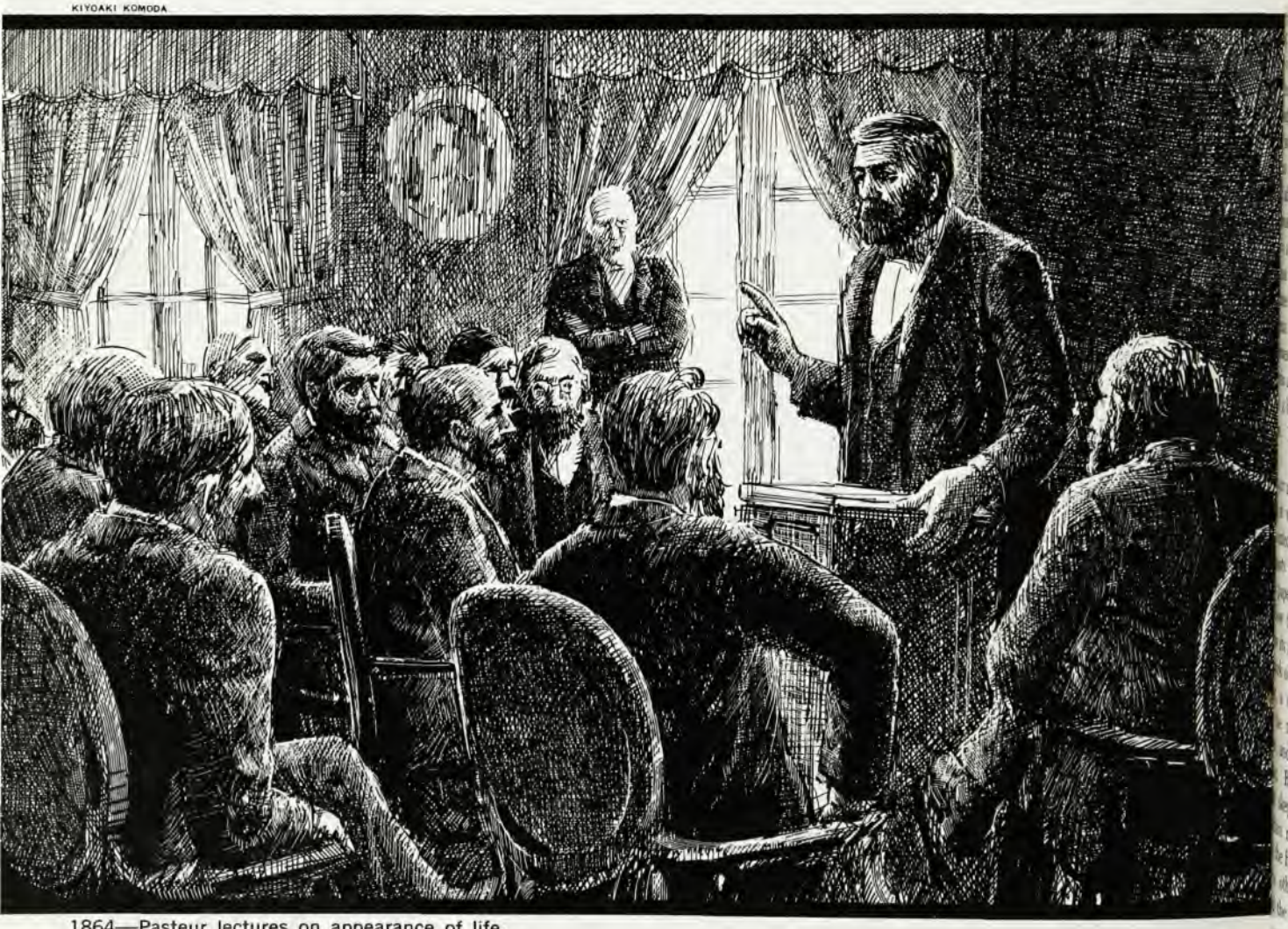

1864—Pasteur lectures on appearance of life.

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to others (some with an axe to grind). One therefore becomes increasingly dependent on the advice of scientists in whom one has confidence. The value, for example, of attending a meeting of the American Physical Society is as much in the corridor consultations as in the meetings and press conferences. The press conferences, although expertly managed, represent only a limited number of sessions. If one restricts one's coverage to such sessions, one again forfeits the privilege of selection, although the selection is expertly done.

Seeking corridor advice is, of course, also subject to pitfalls. Even the most modest and self-effacing scientist can not be an impartial judge of his own work, or the work of those close to him. A stint as a foreign correspondent, or even as an investigative reporter, is useful in training one to spot bias and seek out various viewpoints.

Attending a conference is often a discouraging process. One hears a thrilling tale from one physicist (either in a corridor, at a meeting, or in a press conference). He has found the long-sought "zeta" particle, and it behaves just as predicted by theory. If one then makes the "mistake" of consulting others, one finds that few, if any, consider the finding valid. In this way a great many "good stories" have gone up in smoke.

Reliance on university and corporate press offices is also hazardous. One comes to discriminate between those who are careful in what they select for a big splash, and those who are not. Two instances come to mind:

A major university held a press conference at which elaborate press kits were handed out, with biographies of participants in an experiment. Background papers explained in laymen's terms how the experiment was done and how its results fit into the general framework of physics. The story was exciting, a candidate for page one. When the meeting ended the hour was late, and there was little time for checking. But within a few days reports of skepticism were coming in, and within months other laboratories showed the findings to be spurious.

In the other instance a university reported the findings of a prominent astronomer regarding one of the outer planets, although the interpretation was preliminary in nature. Astrophysicists at another institution, meanwhile, explained the findings in a quite different way, and the original report, by then published in the press, was hurriedly withdrawn.

To me, however, that findings reported in the press prove in a few cases to be erroneous is not disastrous. When results from the flight past Mars of two Mariner spacecraft last year were first analyzed, they were taken by one well known chemical spectroscopist to hint at the presence of life. Should his speculations have been suppressed until confirmed or agreed to by colleagues? I think not. That, to me, would be denying to the public some of the adventure of science. He was, apparently, mistaken, and some would like to confine such episodes to the halls of science, lest the public become mistrustful of scientists when shown how they err. It is unlikely, however, that the public can ever be persuaded that scientists are infallible, and it would be a deception to try doing so.

Another source of resentment by physicists is the attention given by the press to certain of their colleagues, typically men with eloquence or a dramatic flair. Some are leaders and spokesmen of science, but the ones most apt to raise the physicist's hackles are those who provoke scientific debate—and news stories—by uninhibitedly coming out with unorthodox ideas. Only grudgingly do their colleagues concede that such people perform a useful role in challenging accepted tenets and, once in a while, opening fruitful new lines of thought.

Others whose names appear frequently in print are those whose statements are not necessarily dramatic, but whose work is in a field of special public interest, something the layman can readily understand, such as seafloor spreading or the monitoring of radio signals from the pulsars. There are, of course, scientists who are shameless publicity hounds. They are easily and quickly identified, and their eagerness is, if anything, a hindrance to their attempts. No report is checked out more carefully than that which comes directly from its originator or is drawn to the reporter's attention by a telephone call from the author.

Sometimes, too, a physicist is unjustly accused of seeking publicity. One of my colleagues, a few years ago, heard from an independent source of a relativity-testing experiment and telephoned the participant to request an interview. The result was a front-page story telling of a project that was about to be reported in *Physical Review Letters* (and had been described in preliminary fashion in an earlier published report). The physicist was sharply criticized for publishing in the popular press before he had published in the professional journals, although this was not really the case.

It must be remembered, however, that journalism is a competitive business. The newsman measures his success, in part, by the number of "beats" that he gets. He delights, in a somewhat sadistic fashion, in hearing how his rivals have been awakened in the middle of the night by an editor who asks why they have not reported the news that appears on the front page of a rival newspaper.

Although such competitiveness leads to enterprising reporting, it also motivates exaggeration, probably the chief problem in journalism. It particularly affects the wire services. If a newspaper subscribes to more than one such service, the first bulletin that reaches an editor's desk is typically the story that will be used. If the story is sensational enough, it may make page one, another feather in the reporter's journalistic cap.

Such competitiveness is, fortunately, less characteristic of science reporters, both for newspapers and wire services. By and large, for example, they are willing to cooperate with an author whose report is about to be published, holding their story until the date of its appearance.

The journalist is continually required to choose what he covers. Many stories in physics are so difficult to understand, for those with no knowledge of the subject, that to present them is a great challenge, and to follow them is, for the reader, an arduous undertaking. The journalist must therefore make a value judgment: Is this story important enough to justify the effort? If, from day to day you make your readers work too hard, they will stop reading your stories (or your editors will stop printing what you write).

There is a good deal of fun, and some humor, in the daily flow of science news. The answer, therefore, is to offer a balanced menu. Serve some solid, heavy food but also some frothy French pastry. There is joy, as well as wonder, in science, and the science writer should communicate as much of the joy as he can. □