cerebral hemorrhage. Surely the age of the people at death is a critical, pivotal characteristic in this type of research, for if the smokers of cigarettes are generally younger than the nonsmokers, one should naturally expect them to show fewer of the degenerative diseases (other things being equal)—not more, as is generally the case in the evidence presented for the "diseases" listed above.

In the one case where they make specific use of the subject's age in relating smoking habits to the severity of aortic sclerosis at necropsy (see their Table 3), they gave each aorta "an 'arteriosclerotic age' through comparison with a set of previously prepared photographic transparencies of aortas which represented the standard or average degree of sclerotic change observed in each half-decade of adult life." As a result of this method of analysis, Wilens and Plair found highly significant differences ($P = .001$) in the degree of aging, favoring 40 percent of the non-smokers as compared to the heavy smokers.

I was confused by the fact that the probability figure in their Table 1 was given as $P = .028$, while they claimed that this was not significant, until I discovered that this was a typographical error and that the probability should actually have read .28.

We need more information before it can be so firmly stated that cigarette smoking does not contribute to the development of arteriosclerosis.

CARL L. JOHANNESSEN
College of Liberal Arts, University of Oregon, Eugene

The mean and median ages of the various categories of smokers discussed in our report are shown here in Table 1. Undoubtedly, if heavy smokers of cigarettes had survived, on the average, 3 years longer, as the nonsmokers did, the incidence of myocardial infarcts among them would have been somewhat but not greatly increased. The reports on the clinical incidence of myocardial infarcts suggest that the increased susceptibility in heavy smokers of cigarettes is so pronounced that it is not concealed by their tendency to develop fatal cancer of the lung.

The development of one fatal condition unquestionably influences the incidence at necropsy of other fatal conditions. In other words, if a high percentage of heavy smokers of cigarettes did not die of cancer of the lung, they might die a few years later of myocardial infarction. Our observation that the severity of aortic sclerosis is significantly increased in such smokers suggests that this might be the case. Whether or not this is so, the fact remains that in our series there was no significant increase in the number of myocardial infarcts at necropsy in the heavy smokers of cigarettes, contrary to what the clinical reports would have led one to expect.

Table 1. Mean and median ages of smokers in various categories.

Category	No.	Age	
		Mean (yr)	Median (yr)
Nonsmokers	161	60.2	64
Cigarette smokers:			
Light	153	59.3	64
Moderate	289	58.3	61
Heavy	199	57.7	61
Pipe and cigar smokers	71	66.5	68
Unknown or unclassified	120	63.3	65

We did not intend to state "firmly" that "cigarette smoking does not contribute to the development of arteriosclerosis" but meant to suggest that the connection between the two, if it exists, is much more tenuous than has been claimed and that, as a practical matter, the heavy smoker of cigarettes may not be much more likely to develop a myocardial infarct than a nonsmoker.

S. L. WILENS
New York Veterans Administration Hospital, New York

Science Reporting in Journals and Newspapers

The editorial of 18 January, "Science reporting," treats fairly neither the problem nor the proposed solution. The policy of the American Institute of Physics, I believe, is to deny publication to papers the main contents of which have been released by the authors or their organizations to the daily press, but to encourage the publication and the release to the public of such information after it has appeared in the scientific journals. Thus, reporters who wish to verify the relevance of a release may consult their scientific advisers, who will have details at hand in a form guaranteed by the editorial standards of the scientific journal to be reasonably lucid, complete, and of some novelty. In my opinion, the results of a scientific investigation do not exist until

they have been published in a form sufficiently complete for the scientific community to judge the value and the validity of the work.

It is hard to believe that the general public loses anything by waiting for scientific news. If the work is of real interest, it gains because the informed opinion of the scientific community is made available to the reporters. Too often flamboyant scientific results appear in the press and are later found to be incorrect. The correction is not newsworthy and does not reach the general reader.

A man or organization can make a public reputation by releasing his results to the general press without fear of effective criticism. Often it is the fault of his organization and not on the initiative of the individual scientist that such releases are made. The policy of the American Institute of Physics thus gives scientists incentive to police their own organizations and to eschew publicity at the expense of other scientists who publish in scientific journals.

RICHARD L. GARWIN
I.B.M. Watson Research Laboratory, Columbia University, New York

For *Physical Review Letters* and *Applied Physics Letters* to refuse reports of research because there has already been a report in the public press is to debase scientific integrity by applying personal or moral standards, or sometimes even adventitious ones, to the dissemination of research findings.

Such a discountenanced author may indeed have been seeking a cheap publicity, or he may sincerely have believed that he was helping the public to understand science and thus ultimately to support it. With a good science reporter he could have been right. Maybe his enthusiastic colleagues or a hopeful committee on public relations pushed him into prominence reluctantly or even unwittingly. Suppose, moreover, that the implicated author is really at bottom a publicity hound; what business is it of the scientific fanatic to deny his research an equal chance to be judged along with the work of more modest investigators? The weight of the history of science is on the side of personal vanity's favoring discovery.

It is also true that even good science reporting in the public press is unlikely to become a proper substitute for the scientist's own report in a standard journal. . . . No scientist goes to the New York *Times* for such information and his abstract journals do not cover

it. Exclusion of investigators from the normal channels of scientific communication because they have consorted with the press seems to me to be partly a moral issue and an uncertain one at that.

EDWIN G. BORING
Harvard Psychological Laboratories, Cambridge, Massachusetts

. . . Any effort to restrict or confine coverage of scientific news seems to me incredibly shortsighted. I cannot see how it serves scientists' interests. Or those of citizens generally.

Some science reporting is irresponsible. So is some reporting of government news. But shall we wait for the history books, a generation or more from now, to know in what directions our world has gone? . . .

ROBERT SOHNGEN
No address given

. . . I do not believe a scientist's behavior can be divorced from his standards of work in the laboratory. Restraint in stating conclusions in *Science* presupposes restraint in headline-seeking in the New York *Times*. . . .

The public is, undoubtedly, entitled to know what is being done with the tax funds it spends on research. The way to keep it informed is not by competitive advertising on the part of individual investigators. The responsibility lies with the granting organizations which deal out the money.

B. RAYMOND FINK
College of Physicians and Surgeons, Columbia University, New York

. . . The tragedy of the situation is that the two publications of the American Institute of Physics, *Physical Review Letters* and *Applied Physics Letters*, are both financially endowed by a public agency, the National Science Foundation. . . . So taxpayers are heavily subsidizing, on the basis of speed of announcement, two more or less private publications which inhibit, and in practice prohibit, the speedy announcement of scientific findings through any other media. . . .

ARTHUR KRANISH
Washington Science Trends, Washington 4, D.C.

. . . An article in *Organic Gardening* (December 1962) mentioned results of some research on activities of earthworms which I did not know about. After some correspondence I have been informed that the material mentioned

presumably was taken from newspaper reports of a paper presented at the annual meeting of the Soil Science Society of America last August. None of the results of the research have been submitted for publication, but the author hopes to submit a manuscript to the Soil Science Society of America Proceedings.

G. E. GATES
251 Silver Road, Bangor, Maine

. . . An item noticeably missing, which might also cause concern on "prepublication," is the technical report. Much research is performed under federal support, and research progress is published in report form, or in manuscripts incorporating their contents in part, which are also submitted to the scientific journals.

These reports have, at best, limited circulation. A given report presents only a single facet and includes either data and details too voluminous for inclusion in journals at current page costs, or information of a progress nature which needs integration with future results before journal publication would be appropriate.

ROWENA SWANSON
505 Seward Square, SE, Washington, D.C.

. . . The policy of the American Institute of Physics makes the barrier between scientists and the public higher and thicker. . . . It will not improve the quality of science news published in mass media. In fact, it may dissuade competent and honest scientists from cooperating with science writers.

H. P. LEIGHLY, JR.
Department of Metallurgical Engineering, University of Missouri, Rolla

The timely release to the press of scientific news involves a deeper question than how much is owed the public. . . . Who owns science? Whom does science serve? Is the scientific fraternity truly a type of Greek-letter society, whose mysteries are to be withheld from the barbarian non-fraternity men? In recent years a widened chasm between scientists and the public, resulting from the increasing complexity of maintaining meaningful communication, has created the non-scientists' reaction against "eggheads."

Accurate reporting of science news is the reporter's responsibility. The scientist has discharged his responsibility in providing information fairly and accurately and in as simple language as the complexity of the subject matter will allow. If the reporter then errs, it is the public he fails, not the scientist; his disservice is to journalism more than to science. But to withhold science news from the press as a whole because of the malfeasances of some of its members is illogical.

The gee-whiz approach to science journalism flourishes not entirely because science writers "tend to seek the more glamorous items." The public is interested in such items more than the others, but also shows interest in what will, or can, affect it directly. It is more interested in reading of the possibility of controlling weather by means of black asphalt ground coatings than it is in the effect of estradiol on the hypothalamic neurons of rats. The latter may eventually have more direct effect on the lives of humans than the former, but this is difficult for the public to see immediately.

Both of these items are taken from the same issue of *Science* in which the editorial now under discussion appears; the item on weather control did appear in the daily press. If the other appeared, I missed it.

The American Institute of Physics has a legal right to buttress the walls of its tower with more ivory, and to its opinion that "scientific discoveries are not the proper subject for newspaper scoops." But it only makes itself, and by extension all scientists, look foolish and petty.

E. E. SLOMAN
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I was somewhat surprised because you apparently misunderstood the *raison d'etre* of the two express journals, *Physical Review Letters* and *Applied Physics Letters*, and chagrined because you call their respective editors on the carpet for obstructing rapid release of scientific information to the public.

The original intention leading to the establishment of an express journal such as *APL* was to expedite, rather than to delay, the appearance of urgent results in a form useful to the research physicist. Urgency is not necessarily synonymous with importance. There are many research papers of immediate and lasting importance which are not urgent. On the other hand, urgent "letters" may not have appreciable durability. A communication is judged to be urgent primarily because in the editor's or reviewer's considered opin-

ion it may exert a strong influence on the direction of future effort and the present expenditure of resources in an active field of physical research. Only a small fraction of urgent communications are of immediate interest to the general public, at least judging by the treatment given the various topics covered by *APL*.

The space available for these urgent letters is premium space. It is both costly and limited, as we can carry only about 20 letters each month. Why then should this premium space be used to announce to the scientific community research results already disclosed in the public press, or, for that matter, in the Bulletin of the American Physical Society in abstract form? The purpose of early announcement has already been fulfilled and the urgency in large measure has been removed. Further airing of this information would only reduce the available space in *APL* for the not so "newsworthy" but, nevertheless, urgent letters.

There is another point which the gentlemen of the press do not seems to have grasped. The *APL* is only one activity in our editorial office. It is, in fact, auxiliary to the *Journal of Applied Physics*, which carries full length research papers as well as short scientific communications. There is no restriction relating to prior, brief disclosure on papers submitted to *JAP*. Therefore, we have left the choice with the author: (i) He may submit his contribution in abbreviated form to *APL*, agreeing to withhold public announcement until after the letter's appearance. (Acceptance, of course, is contingent upon the recommendation of a qualified reviewer. Failing acceptance on the basis of urgency, the contribution may still be considered as a communication to *JAP*.) (ii) He may announce his results to the news media immediately and submit either a full length paper or a short communication to the *JAP*. The reviewing procedures are equally rigorous for the two publications, but the minimum publication delay is 4 months for the *Journal* and 15 days for the *Letters*.

Our contributions are unsolicited (except for an occasional review paper) and there is no attempt to tell the author which course to follow. Our prime consideration is to serve the scientific community and it is to this end that our policies are formulated.

However, a deeper issue seems to be involved: Is the public interest better

served by *rapid* reporting or by *accurate* reporting? Toth infers that speed should be the overriding consideration. He is impatient with the reviewing system that the scientific community has voluntarily adopted in the interest of preserving the integrity of its record. If he had to wait 4 to 6 months to check his story, one might be sympathetic with his impatience. However, when the period required for publication is only 3 to 4 weeks, during which time the article has been critically reviewed by a qualified individual, one wonders, "Why all the fuss?" Indeed, it seems that express-letters journals offer a service to the general public as well as to the research community. At the cost of only a small temporal inconvenience, the public may now obtain through news media information which has been reviewed and which therefore bears a much stronger claim to objectivity and accuracy. In the same sense, express publication can be considered a service to the science news writer himself: He has reasonable assurance that the facts in his story have been checked at a level of competence higher than he can muster without a considerable degree of inconvenience.

These remarks should in no way be construed as disparaging of the valuable service rendered by science reporters. Theirs is a difficult calling and their efforts deserve the respect of both scientists and the general public. Moreover, there should be no fear that scientific journals will ever compete with the daily press or that their editors will as a matter of deliberate policy obstruct the reporter's access to information. Rather, I am convinced that the innovation of express journals will assist the science reporter in his important function of linking the scientist with the general public.

J. H. CRAWFORD, JR.
Journal of Applied Physics,
Oak Ridge, Tennessee

Consumption of Water

The article, "Human water needs and water use in America," by Charles C. Bradley [*Science* **138**, 489 (1962)] appears to be based on erroneous assumptions. It is conceivable that Malthusian limits will be imposed upon the population of North America, but it will not be in the foreseeable future and least of all will it be because of lack of water resources.