

the committee, Thomas P. Fleming, medical librarian, College of Physicians and Surgeons, New York, N. Y.

APPLICATIONS for grants from the Cyrus M. Warren Fund of the American Academy of Arts and Sciences should be received by the chairman of the committee, Professor Frederick G. Keyes, of the Massachusetts Institute of Technology, not later than April 15. Grants are made in aid of chemical research, generally for apparatus or supplies, or for the construction of special facilities needed for research in chemistry or in fields closely related to chemistry. Grants are not awarded for salaries, and on account of limited resources, the amount to an individual is seldom in excess of \$300. Application blanks may be obtained from the chairman upon request.

THE New York Hospital School of Nursing has become a part of Cornell University in an affiliation whereby qualified graduates will receive a university degree. Together with the New York Hospital and Cornell University Medical College, the School of

Nursing is a unit in the medical center at 68th Street. It will be known as the "Cornell University-New York Hospital School of Nursing." The curriculum includes classroom study and practical experience in the New York Hospital. Students entering with two or more years of college work acceptable to Cornell University will be eligible for a degree of bachelor of science in nursing upon satisfactory completion of the three-year course.

AMONG the public bequests of the late Sir Arthur William Hill, director of the Royal Botanic Gardens at Kew, are £1,000 to Bentham-Moxon Trustees of the Royal Botanic Gardens; his diaries of various journeys are left to the library of the gardens; £500 to Kew Guild; £1,000 to the Royal Society; £500 to the endowment fund of St. Luke's, Kew Gardens, and, after personal bequests, of the residue, one eighth to King's College, Cambridge, and one eighth to Marlborough College. The value of the estate is placed at £93,379.

DISCUSSION

ON THE READING OF SCIENTIFIC PAPERS.

AUDIENCE ENEMIES NUMBERS I TO VI

A FEW years ago a large international congress was held in one of the most beautiful cities of Europe. The committee on arrangements had planned every detail to perfection. The university buildings were new, the lecture halls ample. Each platform was provided with a two-foot clock that not only pointed out the elapsed time but also turned on a red light at eight minutes and a big flashing light at ten minutes. When the meeting started, one could say "Every prospect pleases."

Only man was vile. One hour after the opening members realized that the distinguished chairmen of the sections were not holding the speakers to the ten-minute limit so carefully stipulated in the programs. Therefore, every speaker counted on talking fifteen or twenty minutes. Of course he saved his most important slides until the end and they were shown in competition with the flashing light plus an obviously nervous chairman.

In addition, there were all the other minor and major human defects best calculated to torture an audience. Most of the speakers mumbled their words or else turned and lectured to the lantern screen. This was particularly annoying, since the papers were delivered in four different languages, each with its local variants. Most of the lantern slides were photographs of typewritten sheets crowded with data, and few speakers were content to show less than twenty. The main points were carefully concealed until the last

minutes, by which time the audience had lost all interest.

This meeting was perhaps an extreme example, and in our country most of the papers are carefully prepared and carefully delivered. There are, however, enough poorly delivered papers to warrant a discussion of what may be called "audience enemies":

1. The Mumbler, who drops his voice to emphasize important points or else talks to the lantern screen instead of to the audience.
2. The Slide Crowder, who packs his slides with typewritten data and shows too many slides.
3. The Time Ignorer, who talks beyond the limit specified in the program or justified by common courtesy.
4. The Sloppy Arranger, who jumbles his material.
5. The Lean Producer, who has poor material.
6. The Grasping Discussor, who when he gets talking stays talking.

Of course there are many other ways in which a speaker may cause discomfort, but the ones that I have selected are chosen because they can be remedied either by the head of the department or by strict self-examination.

Number 1, the Mumbler, is handicapped by poor habits of speech, an incorrectly placed voice or else an inherent nervousness. In other cases bad delivery is caused by lack of consideration in a man who is more interested in excreting words than in conveying information. When he turns to the screen and talks at the chart he is paying more attention to his own achievements than to the audience. This is particu-

larly disastrous if he wanders away from the microphone.

Number 2, the Slide Crowder, wishes to show just as much of his data as possible and thus demonstrate his industry. He prepares many slides from typewritten sheets, because this is the easiest method. He ignores the fact that the typewriter has the worst possible type for display at a distance. Has any one ever seen such type used on advertising bill-boards? If he would only have his slides drawn with india ink the very labor involved would cause him to limit his material to the essentials, and these would be legible. It is a simple matter to calculate for a ten-minute paper just how many seconds each slide will be exposed on the screen and how much can be read and understood while thus exposed. Every nonessential word or figure distracts the eye from the small fraction that is essential. A good slide needs no pointer or verbal explanation.

The ideal method of competing with a slide is to employ one of the modern flashlights with a bright arrow that dances all over the screen and ceiling. There is nothing in black and white that has a chance of holding the eye when a bright arrow swoops and darts like a hornet.

Number 3, the Time Ignorer, who exceeds the limit set by the program is purely selfish or else overimpressed with the idea that his paper is much more important than the program committee had imagined. He may have planned deliberately to go overtime but more probably did not take the trouble to rehearse his paper with a watch. If he did use a watch he forgot that it always takes several minutes longer to deliver a paper from a platform than to read it in an empty room.

Number 4, the Sloppy Arranger, selects the method of presentation best calculated to confuse the audience. He may have in the back of his head the idea that he can lead up to a climax and hold the audience in breathless suspense until in the very last sentence he can prove that the venous blood of the wimpus contains only 3 milligrams of gadgetyl chloride instead of 4 milligrams. Would it not be kinder to the audience if he followed newspaper technic and gave in a headline, early in the talk, some idea as to what and wherefore?

Number 5, the Lean Producer, is only relatively lean. If he has one fact to exhibit and does it modestly he has made a contribution. If he does not recognize his paucity of material he does more harm than good. The real audience enemy is the man whose paper consists of trivia, errata, omissia, et cetera; mostly et cetera.

Number 6, the Grasping Discussor, can spoil almost any meeting. If he has been invited to open the dis-

cussion he has probably prepared a nice little paper of his own with scant reference to the paper of the evening. There is another type of discussor who happens to have in his pocket some lantern slides that he would just like to show for two minutes.

In the face of all these enemies the audience itself can do but little. The chairman, however, can do a great deal. Perhaps instead of chairman he should have the title of "Sole Protector of the Audience." If he has established a reputation for keeping people within their time limits they will take the trouble to arrange their material and lantern slides and bring out their main points in a decent manner. The faults of poor delivery, poor slides and poor material are the responsibility of the head of the department. He should guard the reputation of his institution. Unfortunately, some heads of departments exhibit in their own deliveries many of the faults enumerated.

The time to start training is when a man is young. In one medical school this has been tried successfully with the fourth-year students taking their clerkship in the medical dispensary. Every Saturday morning a group of clinical clerks have gathered to hear four fifteen-minute papers delivered by members of their class. The students have been warned that the papers are limited strictly to fifteen minutes and that in rehearsal they must not take more than twelve minutes. They are advised to talk to the men in the back of the room, since these are the most difficult to keep interested. They are taught that time spent in listening to a dull lecture, poorly delivered, is not wasted if they study the faults of the speaker and consider the methods by which they may be avoided. In a few sessions they develop a technic of delivery that is much better than the average found at scientific meetings. This allows the speakers and the audience to forget the delivery and concentrate on the subject-matter.

The man who goes overtime, uses crowded slides and mumbles his words is seldom more than 50 per cent. audience enemy. If his paper comes in the middle of the session it does not affect the first half of the program, even though he talks far beyond his limit. If his slides are crowded, half of the material can be read by the front half of the room. The same front half can usually hear him, even though he mumbles his words. He would not dream of saying, "The public be damned." He just damns the rear half.

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ON A SYSTEM OF FILING REPRINTS

THE system of Professor McClung¹ for filing reprints seems to us rather interesting. We would like

¹ L. S. McClung, *SCIENCE*, 95: 122-123.