make the point that involuntary methods of population control, which are now considered unacceptable, may become acceptable when society realizes that the alternative is mass starvation. If we wait until massive starvation is upon us to begin to develop such methods, millions of people will suffer and die unnecessarily while the effective methods are being developed. As scientists, we should provide to the extent as possible with adequate means to cope with the problem, even though such methods would not be used at this time. As informed citizens, we should try to make society aware of the consequences of inaction in reducing the birth rate. Ultimately, whether or not involuntary methods are used is a decision which should be made by society, not by scientists; but if scientists wait to develop effective involuntary methods until they are acceptable to society, the time lost may result in an enormous amount of avoidable death and suffering.

MELVIN M. KETCHEL
Department of Physiology,
Tufts University School of Medicine,
Boston, Massachusetts 02111

References

Pharmacology Institute Proposed

Rockliff's comments (Letters, 20 Dec.) on the Food and Drug Administration requirements for filing toxicity reports by pharmaceutical companies and his reply to my letter (16 Aug.) call for some explanation. . . . The Kefauver-Harris amendments requiring that drugs be both safe and efficacious became effective 1 June 1963. Since that time, we have made four studies, two of which were not submitted to the FDA. The legal status of toxicity data of a specific drug at a certain time and place is for government and industry attorneys to determine in court. This is a legal ambiguity that needs clarification. In the meantime, who protects the drug consumer? The seriousness of the problem to the patient and doctor is illustrated in a drug surveillance study by Borda (1) which showed that 35 percent of hospital patients have adverse drug reactions. Prevention of drug reactions begins with the original evaluation of a new drug.

It appears to me that the coordina-
tion of clinical drug evaluation is beyond the capacity of the investigator, the university, the government, and the pharmaceutical industry. A National Institute of Pharmacology with legal and scientific responsibility is essential. This would be a federally sponsored institute which would stimulate and supervise basic and clinical drug research with an emphasis on new drug investigation. The primary involvement of the FDA with food, cosmetics, manufacturing, and advertising indicates that new drug investigation should be in a separate program patterned on the National Institutes of Health. The work of such an Institute of Pharmacology should be conducted by universities and research facilities which conform to the highest standards of personnel, equipment, and research design. The pharmaceutical industry would not be relieved of its obligation to demonstrate the effectiveness and safety of its products and to underwrite the cost of this work but there would be a federal capability which would set standards and enforce them. Such a program would insure the badly needed financial support of new drug research. It would also require complete and prompt reports of new drugs which would be available to the investigators as well as to the government.

Paul Lowinger

School of Medicine,
Wayne State University, 951 East Lafayette, Detroit, Michigan 48207

Reference

Overhead Costs during Austerity

The austerity program for scientific research is requiring some adaptations. For example, in our department the cost of publication page charges for a 12-man faculty was $15,000 last year. This means that page charges cost as much as an additional faculty member. We have been wondering whether the actual scientific communication achieved by the present method is worth the cost. Because we are skeptical, we are trying the following method. Work which is supplementary to an existing key publication will not be published per se but will be written up with no regard to saving space, then will be multilithed, and made available as a numbered "Supplemental Publication"
of our department. We intend to deposit two bound volumes of these in the university library each year so that Xerox copies can be sent to anyone for the normal cost. In this way we can provide the information whenever it is needed and we can publish the key parts of the research with more brevity. We would also welcome two new avenues of publication: 1000-word summaries and current reviews covering about 10 to 15 papers in one area. We feel this latter exercise would serve to advance the faculty, rather than produce an inchoate mass of publications whose usefulness is in question. This threefold method of publication would save costs, reduce the mass of literature on the shelves, and appreciably increase scientific communication.

Our second area of adaptation causes more concern. It has been our practice to employ undergraduates and high school students in the laboratory. Many of these have become first-rate scientists: all have benefited in increased maturity and responsibility. Now we have to cut them off. If funds from an appropriate agency, such as the Office of Education, could be added to each research grant for this purpose, a real human value would be retained.

In the atmosphere of austerity the overhead which is incurred becomes of real importance and forms a strong point of division between scientists in the laboratory and administrators. Faiman’s recent remarks (Letters, 27 Dec., 1968) are pertinent. I suggest that granting agencies require that the use of overhead be explained by the institution to the principal investigators, that discussion of the manner of its use be permitted, and that the agency be aware of what takes place in such discussion.

ERNEST C. POLLARD
Department of Biophysics,
Pennsylvania State University,
University Park 16802

What Makes Oysters Grow?

A letter from Adler (29 Nov.) comments on Bardach’s article “Aquaculture” (13 Sept., p. 1098). It is Adler’s opinion that Bardach created a wrong impression in a statement to the effect that oyster larvae need flagellate algae for food. Adler says further that “Good larval growth has even been achieved with some nonliving substitute food like corn flour.” We are not familiar with any success at rearing larvae with non-living foods. Either Adler has created a wrong impression of the state of marine animal husbandry, or he knows of a very important breakthrough not generally known to practitioners and scientists in aquaculture. . . .

RICHARD J. BENOIT
EDWARD A. ZURAW
DONALD E. LEONE
Marine Sciences Research and Development, General Dynamics,
Groton, Connecticut 06340

The search for artificial foods for marine bivalves and their larvae began in the early 1930’s (1). In 1940 Bruce et al. (2) showed that live, naked flagellates were superior to some other algae for rearing larvae and spat. These studies have been confirmed many times during the past 28 years and laid the foundations for present-day hatchery techniques. Investigators have continued to search for other algae or substances which would give better results. Walne (3), evaluating the food value of seven algal species for oyster larvae, found that the diatom Phaeodactylum tricornutum promoted growth comparable to that of flagellates, while Imaya (4) indicated that both Cyclotella nana and Chaetoceros spp. are well utilized. Somewhat questionable results were obtained by Loosanoff and his co-workers (5) by feeding dried powdered Ulva and Laminaria to larvae, but when freeze-dried Schedesmas obliquus was used, Hidu and Ukeles (6) reported excellent results. Corn starch and corn meal or both were employed in oyster feeding experiments by Haven and an enthusiastic evaluation of its successful application was published by Ingle (7). Benoit and his co-workers might discover additional references by consulting the literature or the researchers mentioned above.

CYRUS ADLER
Offshore/Sea Development Corporation, 99 Nassau Street,
New York 10038

References
Bringing automated lipid analysis to the laboratory will give you some startling results.

Not the least of which is the gratitude of your technologist for eliminating the tedium usually associated with manual methods of lipid analysis. The Technicon® AutoAnalyzer® simultaneously quantitates triglycerides and cholesterol from one plasma extract at the rate of 40 samples per hour (80 determinations). The system is fast, versatile and fully automatic. It provides the means for performing a great number of analyses rapidly and accurately with a minimal amount of effort. Of course, if you already have an AutoAnalyzer, this capability is available through a modest addition of equipment. For more information, write Department 56, Technicon Corporation, Tarrytown, New York 10591.
Zeiss plumbs the oceans' past

From Jurassic times to Recent the oceans have been gathering the skeletons of Coccolithophorids, the golden-brown algae.

Though only a few microns in diameter, they are so numerous they make up about 30% of the ooze of the sea's floor from 3,000 to 10,000 feet and sometimes deeper. From study of such small evidences can be constructed to a great degree the history of our oceans.

But to see and study them they must be magnified 600 to 25,000 times. This electron micrograph shows an enlargement of 5,400x.

It was taken using the Zeiss EM 9A Electron Microscope. Instruments for plumbing the past or building the future are of concern to Zeiss engineers. Wherever optics are important...in science and industry, in research and application...you can count on...

Zeiss
The great name in optics

Circle No. 5 on Readers' Service Card
Any little 12 1/2” x 19” area in your lab is large enough for the new Lauda K-2/R all-stainless steel refrigerated constant temperature circulator to do its job. And what a job it does. It’s ideal for tempering accurately many types of jacketed laboratory appliances at temperatures down to -10°C. Don’t let the word “refrigerated” fool you though—the Lauda K-2/R also heats to 150°C. Here are some of its outstanding features: Tecumseh compressor eliminates the need for auxiliary cooling systems such as tap water or dry ice. Reservoir tank, pump, heater, cooling coil and circulating lines (everything that comes in contact with the liquid) are stainless steel. Solid-state electronic control with an exclusive new type of extra-sensitive thermoregulator. Flow control and drain valves facilitate operating and emptying. Top opens for easy filling and immersion of samples. Control accuracy is ±0.01 to ±0.02°C. Yet this compact instrument costs only $595. Hard to believe? Why not write for a copy of our new 32-page catalog. It provides information on all of our constant temperature baths and circulators for control from -120 to +330°C.