ORGANIZED POPULATION RESEARCH: PROGRESS AND PROBLEMS

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In the last few years we have witnessed increasing recognition of the gravity and variety of population problems in both the developed and the developing worlds. The problems in these two worlds are remarkably different but they are equally serious, complex, and urgent.

The response of universities and of private and public agencies to population problems has been encouraging, though many feel that it is still far from adequate. This response has several sources. One is a genuine concern for human problems: benevolence without ulterior self-interest. This is the altruism which Gunnar Myrdal deems to be the only valid justification for foreign aid. He reminds us that to the extent we export population concern we should be careful to be guided by this altruism.

Another and less reputable source for the response to population problems is the fear and guilt of the comfortable upper and middle classes in all countries, which 'recline on the multitude'. We recline at the edge of our sofa feeling guilty, and fearful of being tipped off. But the most critical and ultimately most productive source of the response of science to finding answers to population problems is intellectual curiosity and interest. More and more scientists are appreciating that the many fields of population research are not only socially important but professionally challenging.

What exactly are the goals of population research? They depend on how we define the problems, and our definitions will change with time. We have seen changes in social attitudes and practices which can only be characterized as revolutionary. We certainly were little prepared for the remarkable changes that resulted from oral contraceptives and induced abortion and now we seem to do little more than monitor the changes as best we can. We can do better. We must maintain and improve the scientific base of our understanding of all aspects of human reproduction so that we not only monitor but predict events and find solutions to population problems as they change with time.

These problems are incredibly complex and interrelated. They vary remarkably not only in different parts of the world but within single communities, since they are often dependent on social class and personal opinion. To demonstrate this complexity let me state two propositions that one would expect to arouse little debate: (1) population growth must cease sometime and (2) the currently available array of techniques for regulating fertility is not completely satisfactory. The first statement may be true but one can initiate inconclusive

debate simply by asking when growth should stop and under what conditions. The need for new contraceptive technology is accepted by most, but there is debate concerning what types are needed. Table 1 lists some specifications for improved methods and demonstrates their variability. Only two characteristics are absolutely essential but they appear to be mutually exclusive, at least to some degree, for it appears unlikely that we shall ever develop a method both completely safe and completely effective. Furthermore, unless the method requires only one decision and one action, its effectiveness also depends on user motivation, which itself is a subject of scientific study.

Table 1. Some specifications for improved contraceptives

<i>Essential</i>	<i>Desirable but not essential</i>	<i>Variably desirable</i>
Effective Safe	Inexpensive Non-medical Device and drug free	Reversible Coitus-independent Male methods Sex determining

Now that I have attempted to establish the complexity and variability of the population research field, I shall presume to describe the population research programme of the National Institutes of Health. The current programme is shown in Table 2. The first three elements constitute the biomedical research

Table 2. The NIH programme in population research

	<i>Field</i>	<i>Budget for 1972 (in millions of dollars)</i>
Biomedical sciences	Fundamental research in reproductive biology	18.9
	Contraceptive development	3.5
	Evaluation of methods in use	5.9
Social sciences	Fundamental social research	2.9
	Directed social research	2.5
Institutional support	Population research centres	1.5
	Training	2.6
	Informational exchange and staff	1.5
Total		39.3

activity: fundamental research in reproductive biology, directed research for contraceptive development and the evaluation of methods of use. The next two elements represent the social science activity. This currently emphasizes studies in demography, psychology, sociology and economics. The last three elements are the long-term support of institutions, training and information exchange in the scientific fields of concern. The table also shows the budget for these elements for the fiscal year 1972 in order to provide an impression of their size and their relations to each other.

It may be useful to interject at this point a brief word about an old chestnut of a

debate. Is this research fundamental or applied? Or to use more current terminology, is it strategic or tactical?

The term which offends the ear most is 'pure' research. Does this suggest that applied research is 'impure'? These are not merely semantic distinctions since publicly supported research, such as NIH research, must be justified in terms understandable and acceptable to non-scientists who support the work.

The storm of papers precipitated by Rothschild's recommendation, that fundamental research scientists should be held accountable to specific goals, included one which clarified my thinking on this issue, making a useful distinction between the nature of research and its purpose. The nature or character of research remains by-and-large the same, whether its purpose is proximate and explicitly goal-oriented or remote and quite vague. To my mind this distinction helps to counter the competing prejudices which say, on one hand, that applied research is somehow inherently inferior and, on the other hand, that fundamental research is expendable.

For example, the nature of the research conducted by members of this Society is high-quality experimental work in reproductive biology in animals and humans. It concerns fundamental physiological processes. The purposes of the research vary. Some are clearly applied, such as work which is part of a larger effort leading to new means of fertility regulation. Other research is not so oriented. It is strategic in that it is within the broad scope of a goal-oriented programme—in this case the study of reproduction—but specific applications are unknown. They may not even be sought. It is enough to say that we need to know more about reproductive processes. Within this broad goal-limitation, we justify such research for its own sake.

One classic justification of such fundamental research in terms of a serendipitous and practical pay off was the research that resulted in oral contraceptives. Much of the basic work which eventually led to their development was done several decades ago. Certainly the scientists were not thinking of oral contraceptives. Development of these drugs was not possible until the new information on reproductive endocrinology was joined by the ingenious efforts of synthetic chemists and by a realization that new contraceptives were needed.

Table 3 taken from a paper prepared originally for American readers displays the principal non-profit agencies throughout the world which conduct or support biomedical research in the population sciences. This is a list of agencies involved in biomedical research only. A list including the social sciences would be quite different. Some agencies, such as the British Medical Research Council, NIH and the Population Council, conduct research in their own laboratories as well as support outside investigators. Others, such as the Ford Foundation and the various governmental assistance agencies, only provide funds.

A welcome newcomer to the family of major participants is the World Health Organization. There is a real need for a major international effort in population research, not only to strengthen the various domestic programmes already under way, but more because the scope of the field, with its complexities and sensitivities, lends itself particularly well to an international effort in which the interests of countries can be merged and concentrated.

It can be seen, therefore, that marked progress has been made in the stimula-

Table 3. Principal not-for-profit agencies which encourage and support contraceptive development and reproductive biology, June 1972

<i>Annual budgets for reproductive biology and/or contraceptive development</i>	<i>Agencies based in the United States</i>		<i>Foreign agencies</i>		<i>International agencies</i>
	<i>Federal</i>	<i>Private</i>	<i>Government</i>	<i>Private</i>	
Over \$1 million	Agency for International Development National Institutes of Health	Ford Foundation Population Council Rockefeller Foundation	Swedish International Development Authority		World Health Organization
Under \$1 million	Department of Agriculture National Science Foundation	Human Life Foundation Lalor Foundation Pathfinder Fund Planned Parenthood-World Population Crisis Foundation of Texas	Canadian International Development Agency Danish International Development Authority Indian Council of Medical Research Medical Research Council (British) Medical Research Council (Swedish) Norwegian Agency for International Development	Simon Population Trust Wellcome Trust	International Planned Parenthood Federation United Nations Educational, Scientific, and Cultural Organization United Nations Fund for Population Activities

tion and support of population research. All of it is organized in the sense used for this paper, but no two are organized in the same way. This multiplicity of approaches is to the good. Nevertheless, a number of serious problems remain. Some concern all of the population sciences, such as the insufficient number of investigators and disciplines devoted to this subject. Examples are the field of reproductive biology, which would advance more rapidly with more work by molecular biologists, and contraceptive technology, which needs the skills of bioengineers. In some parts of the world little or no work is under way in the social sciences. Fortunately these deficiencies and others are being overcome, though perhaps not as rapidly as required.

Another problem, common to all the population sciences, is their unpredictability. There is danger in failing to realize that no problem will prove as simple as it might seem and the danger is in suggesting too soon that solutions are imminent.

The other problem I wish to discuss applies to contraceptive development,

particularly in the United States where there is agreement that development of new means of fertility regulation is essential but will not assure success in solving population problems. Various government and private agencies have identified the development of new contraceptives as a high priority effort, and the drug industry has unique capabilities in this area.

A principal issue concerns standards for drug efficacy and safety—particularly safety. Industry spokesmen and others in the United States claim that current regulations of the Food and Drug Association on safety are excessive and that there is a resultant impasse in drug development. They claim that no significant advances are likely in the foreseeable future unless some relief is obtained, the argument being that the FDA should either liberalize its regulations or step aside and permit another, presumably more enlightened, agency to maintain control.

There is some evidence of decreased investment by American industry in this field: at least there may be decreased activity domestically although foreign operations by American companies as well as by foreign companies may have increased. Because of the commercially competitive nature of these activities it is difficult to obtain reliable and complete information.

Advocates maintain that the population problem is so great that couples should be willing to use fertility regulating methods which have a measurable risk since the risks from population growth are even greater to them and to society. The data shown in Table 4 are used to argue that concern for thrombo-

Table 4. Selected U.S. mortality rates for 1970
(per 100 thousand eligibles)

Lung cancer (males)	45
Motor accidents	26
Pregnancy	21
Thrombo-embolism in women of reproductive age (estimated from case-controlled studies)	
Oral contraceptive users	3.0
Non-users, non-pregnant	0.5

embolism from oral contraceptive use is absurd when compared to the risk of other more likely causes of death, including pregnancy itself. What the advocates fail to recognize is that many women are impressed by this small but real risk and refuse to take oral contraceptives since alternative methods are available.

It can be argued that contraceptives are unique drugs in that they are not used for disease in the ordinary sense and that alternative methods for fertility regulation are available. The result of this reasoning is the establishment of higher standards for contraceptive drugs than for drugs used for disease. Text-figure 1 displays the steps now required by the FDA for the development of new contraceptives and demonstrates the reason for dismay on the part of those who wish to see the rapid development of new methods.

It seems that the issue may not be the stringency of the regulations as such, but the quality of the science used for their development and the atmosphere in

TEXT-FIG. 1. Sequence of events in contraceptive drug development.

which they are applied. Solutions will be found through the development of a collegial partnership among all concerned. Issues will be resolved through open discussion, the stimulation of research on topics of common concern and the open publication of findings.