

## POPULATION

## Study of Attitudes Shows Why Families Are Small

**P**OPULATION problems, so intimately associated with the political difficulties faced by the world today, seem an ideal field for close cooperation between many sciences.

At first glance, the problem of falling birth rates would seem one for biologists to struggle with. Yet since the days of Malthus the matter of population has been recognized as food for the best thought of economists.

A recent study conducted at Columbia University by Dr. John C. Flanagan demonstrates how much the psychologist can contribute toward eventual solutions.

Neither the crowding of certain regions with excess births nor the declining trends in reproduction elsewhere are giving the greatest concern today. Rather it is the fact that, especially in the United States and Europe, the best part of the population in intellectual ability, economic talents, and physical health are losing out numerically while the less desirable biologically are gradually peopling the nations.

About 300 professional men and their wives were examined by Dr. Flanagan

to discover facts about their personalities, attitudes, interests, ideas of values, and ideals that might provide a clue to what causes this unhappy situation.

One-child families are not considered ideal by this group. Like most other people they would like to have three or more children.

Financial factors lead among the reasons causing them to limit their families to a smaller number. And most important among the financial considerations is the cost of higher education.

It is for the psychologist to discover why couples in a much poorer situation financially should be bothered so much less by these considerations when planning the size of their families.

Other matters important to professional men and their wives are the cost of adequate insurance, housing and child care, and the health of the wife.

The theory that the decline of the birth rate in the United States is due to decadence and loss of virility in the human stock of the nation is refuted by other evidence gathered in Dr. Flanagan's study.

*Science News Letter, February 4, 1939*

## MATHEMATICS

## Probability, Chance To You, Plays Role in Daily Life

**W**HETHER we admit it or not, our lives are surrounded by what the mathematician called "probability". Or more simply "chance". And that does not mean betting on the horses or playing the numbers game, although probability enters into these activities in a more predictable way than many of the other things that we do.

The theory of probability is an important sector of both mathematics and philosophy. Scientists will be interested in a survey recently published in the International Encyclopedia of Unified Science (*Principles of the Theory of Probability*, by Ernest Nagel).

One comforting thing is that scientists themselves know that the last word about probability or chance has not been said. That is important to realize these days

when an unsettled situation or controversy in science is likely to be seized upon by dogmatists hostile to freedom of intellectual inquiry.

The daily affairs of men are carried on, Dr. Nagel declared, "within a framework of steady habits and confident beliefs, on the one hand, and of unpredictable strokes of fortune and precarious judgments, on the other."

"Our lives are not filled with constant surprises, and not all our beliefs are betrayed by the course of events; nevertheless, when we examine the grounds even of our most considered actions and beliefs, we do not usually find conclusive evidence for their correctness.

"We undertake commercial or scientific projects, although we do not know whether illness or death will prevent us

from completing them; we plan tomorrow's holiday, although we are uncertain what weather tomorrow will bring; we estimate our budget for next year, although we are not sure whether the consequences of floods, droughts, or wars will not seriously throw it out of balance.

"In spite of such uncertainties, we manage to order our lives with some measure of satisfaction; and we learn, though not always easily, that, even when the grounds for our beliefs are not conclusive, some beliefs can be better grounded than others."

*Science News Letter, February 4, 1939*

## PHYSICS

## "Piped Light" New Tool For the Operating Room

**"P**IPED light" that starts out of a bulb in a convenient location and travels along inside a transparent "pipe" is the newest tool the doctor has in his war on infirmity and disease.

Surgical instruments, with a bulb in their base, that can carry the light to the point inside the human body where it is wanted, are now being made from the new "piping" material, a transparent plastic known as lucite, E. I. du Pont de Nemours and Company have announced.

A tongue depressor made of the new material has a light in its base outside the patient's mouth; yet the light comes out at the end of the depressor, far back in the mouth where the doctor wants it most. Furthermore, the light is cold, so that the patient feels no discomfort from heat.

A possible major application of the new "piped light" is to the tough problem of providing enough illumination for surgery deep in the abdomen or in the brain. Enormously powerful lamps are now used, but they have two serious drawbacks: the generation of terrific heat and glare.

Use of jointed pipe for the light would put the lamps away from the otherwise sweating doctors and would produce a light they could put below eye level, one of the essential steps in eliminating glare. Or they could insert probe "light pipes" inside the incision to provide illumination right where it is needed.

The principle upon which they operate is that of internal reflection. A number of materials, including quartz, have the property of reflecting light within its walls so long as the surface is not broken as in cutting or grinding. The

HISTORY OF SCIENCE

# Ancient Rome Ruled Out As Benefactor of Science

## Borrowed Ideas and Techniques Freely, But Were Not Originators, Declares New York University Scientist



### LIGHT ON THE SPOT

Light "piped" through a curved rod of Lucite can be concentrated exactly where it is most needed, for all kinds of surgical and dental work.

plastic can be molded and polished to keep the light within it; at the desired point the surface is broken and the light pours out there.

*Science News Letter, February 4, 1939*

## RESEARCH

## List Shows University Research Expenditures

LEADING universities of the nation in research expenditures are California, Chicago, Columbia, Harvard, Illinois and Michigan, according to a survey contained in the report of the National Resources Committee by its science subcommittee. These six schools spend over \$2,000,000 a year on research each.

In the group spending between \$1,500,000 and \$2,000,000 a year for research are Cornell, Minnesota, Wisconsin and Yale.

In the \$1,000,000 to \$1,500,000 bracket are four schools: Massachusetts Institute of Technology, New York University, Ohio State University and the University of Pennsylvania.

Spending between \$500,000 and \$1,000,000 yearly for research are: Duke, University of Iowa, Iowa State College, Johns Hopkins, Missouri, Nebraska, Northwestern, Penn State, Princeton, Purdue, Rochester, Rutgers, Stanford and Texas A. and M.

*Science News Letter, February 4, 1939*

ARE WE deeply indebted to ancient Rome, in the line of science?

No, declares Dr. William Salant, guest professor at New York University Medical College.

Dr. Salant has looked into the Roman record for scientific achievement, and has questioned the verdict of those who regard ancient Rome as one of the world's centers of scientific progress.

His view, argued in the *Scientific Monthly*, is that science has its roots in society, but the state of society was unfavorable to science both in Roman Republic and Empire.

The Romans carried totalitarian government to an extreme that wiped out individual freedom, left no incentive to those who might have spent years developing a new principle or process. Rome scorned pure science. War and practical matters were occupations for a Roman.

And, since military conquest brought in thousands of captives, there was plenty of cheap labor—hence no need to worry over technological improvements.

So little were the Romans science-minded, that Dr. Salant declares, "when surveying beyond the simplest type was needed, Greeks had to be employed."

Romans borrowed glass-blowing techniques from Egypt and Phoenicia. They got architectural ideas from Etruscans, and craft and art notions from the Greeks. But, unlike the Greeks, who would have been stimulated by these foreign innovations, the Romans were not inspired. They lacked originality,

says Dr. Salant, dismissing Rome's inventions as unimportant.

Rounding up a verdict on various sciences, he declares:

"That no work of merit on mathematics was produced by Romans is well known. The same was true of astronomy. In the natural sciences Pliny was the outstanding figure, but his work was mere compilation and much of it was worthless. Medicine did not fare much better."

From Rome, it appears, we can learn that it takes more than the economic factor alone to stimulate science, despite those who would reduce history, as well as politics, to economic formulas.

*Science News Letter, February 4, 1939*

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