

SECTION A

The animal is subjected to more or less prolonged ether anesthesia; there is an incision in the abdomen, and nerves and blood vessels are cut; there may be considerable hemorrhage. The organs in the upper abdomen are necessarily injured somewhat by manipulation, and the structures immediately adjacent to the pancreas are considerably damaged. In addition to all this, the dog is deprived of its most important digestive juice and of the pancreas. "Dummy operations" were performed in which exactly the same procedure was followed, involving the same degree of anesthesia, trauma, and hemorrhage. The pancreas was traumatized but not removed. The abdominal incision was closed, and the dogs failed to develop diabetes.

QUESTIONS ON SECTION A

51. Development of diabetes seems related to
- () 1. deprivation of digestive juice
 - () 2. injury to organs in the upper abdomen
 - () 3. injury of structures near the pancreas
 - () 4. loss of the pancreas
52. Which of these statements is most completely true?
- () 1. Anesthesia is essential in an experiment of this kind.
 - () 2. Complex statistical calculations had to be made.
 - () 3. This is an example of a controlled experiment.
 - () 4. The pancreas of the dog is similar to the pancreas of other animals.

SECTION B

The 1947 death rate for the United States was 1,007.8 deaths per 100,000 estimated total mid-year population, excluding armed forces overseas. The 1946 rate was 997.6 per 100,000. Deaths among the armed forces overseas and stillbirths are not included in these rates.

Almost a third, 31.9%, of deaths throughout the nation were due to diseases of the heart. Heart disease deaths increased during the year (1947) by 31,350 over the number of heart deaths the preceding year. Deaths from cancer, apoplexy, and diabetes also increased. The bright side of the picture is that there were fewer deaths from nephritis (kidney disease) and that the major infectious diseases set new record lows in deaths.

QUESTIONS ON SECTION B

53. According to the paragraphs, which of the following is most nearly true?
- () 1. Forecasts of death rates were not made.
 - () 2. Nephritis will continue to decrease.
 - () 3. The incidence of heart disease will continue to increase.
 - () 4. There will be an increase in the death rate from cancer.

PART C

103. Suppose the following statements to be true:
Green-eyed students cannot be taught.
Students who cannot be taught do not love books.
Students who do not love books have no money.
Students who have no money have no neckties.
Students who have no neckties will not talk to teachers
- Which, then, of the following deductions can correctly be drawn?
- () 1. Any student who loves books can be taught.
 - () 2. Green-eyed students will not talk to teachers.
 - () 3. No students have money unless they are green-eyed.
 - () 4. Students who cannot be taught have money.

54. Assuming an uncorrected death rate and a population of 140,000,000, about how many deaths from diseases of the heart were there in the nation in 1947?
- () 1. 321,000
 - () 2. 445,500
 - () 3. 446,600
 - () 4. 1,380,000

SECTION H

It must be remembered that life as a parameter of unknown nature plays a part and is one of the great difficulties in any mathematical treatment of biological problems which attempts to rise above the physical explanation of special detailed phenomena. Living matter is intricate and complex, and an analysis of what in many instances may be oversimplified models thus suffers from severe limitations. This does not mean that the discovery of statistical laws of biological nature and behavior expressible in mathematical terms is impossible, but it is very discouraging to be confronted with the possibility that the great weakness of biological studies over the centuries—namely, their almost purely descriptive nature—will infiltrate the mathematical analyses to the point where mathematics becomes only a technique employed for a new symbolic type of description. It would appear that the important contribution of a "mathematical" biophysics is not to "unify the natural sciences," but first to find or lead to the discovery of purely biological principles, and then to discuss them in a mathematical way in order to elucidate their nature and interpret their consequences. It is not enough to describe specific events, although a certain amount of important information can be, and already has been, gained in this way.

QUESTIONS ON SECTION H

76. According to the paragraph, the chief function of a mathematical biophysics is to
- () 1. furnish more adequate experimental designs
 - () 2. help to develop biological principles
 - () 3. simplify biological concepts
 - () 4. unify all of science
77. According to the paragraph, the greatest weakness of biological studies has been
- () 1. disregard of information and principles of other sciences
 - () 2. lack of statistical techniques
 - () 3. their existence as descriptive science
 - () 4. their inadequate symbolism

104. Which of the following statements is true?
- () 1. Cancer of the stomach can be cured by proper dieting.
 - () 2. Color blindness is more frequent in adulthood than childhood.
 - () 3. Habitual use of alcohol hardens the arteries.
 - () 4. There is a negative correlation between obesity and longevity.

109. Fill in the missing words:
Currently the atom is visualized as a _____ consisting of protons and neutrons, surrounded by _____.
111. From one point of view, foods may be classed as carbohydrates, proteins, and fats. Below is a list of foods. Indicate the classification for each food by writing C if it is primarily carbohydrate, P if primarily protein, or F if primarily fat.
- | | |
|-----------------|-----------------|
| () 1. bread | () 6. cream |
| () 2. cheese | () 7. avocado |
| () 3. milk | () 8. beef |
| () 4. molasses | () 9. eggs |
| () 5. oatmeal | () 10. peanuts |

PSYCHIATRY

If Head Aches, Check Your Love-Hate Balance

► MIGRAINE HEADACHES are caused by a disruption of the equilibrium between love and aggressive or hate instincts. The frequency of migraine, now estimated to afflict one out of every 12 persons, can be reduced by a change in parental attitudes toward children.

These new ideas on migraine are announced by Dr. A. R. Furmanski, of Van Nuys, Calif., associated with the Ross-Loos Medical Group, Los Angeles.

"The adjusting of parental attitudes to the individual child's needs will be attacking migraine at its source," Dr. Furmanski declares.

"A parent who is undemonstrative of affection, who demands an inhibition of aggressiveness in the family, or who is rigid and strict in discipline and training in the nemesis of a child with an innately strong need for love and self-assertiveness," he says.

Dr. Furmanski reports his study of 100 migraine sufferers to fellow physicians in the ARCHIVES OF NEUROLOGY AND PSYCHIATRY (Jan.) published by the American Medical Association.

Science News Letter, February 2, 1952

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ness-sized envelope with six cents in postage to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the science aptitude test.

Science News Letter, February 2, 1952

CHEMISTRY

Detect Spray Residue

► A FAST, economical and easy method for detecting the residue of sprays of the new, fast-acting chlorinated insecticides on fruit and vegetables has been developed by Harold Gordon of the University of California's College of Agriculture, Berkeley.

The detection method involves changing the chlorine in the insecticide to common table salt and analyzing for the chlorine in the salt.

As little as one hundred-millionth of an ounce of such insecticides as lindane, chlor-

dane and toxaphene can be detected by this method. Up to now no easy and accurate analysis has been found for these three compounds. Aramite, methoxychlor, and even DDT residues can also be analyzed with this system.

Up to 50 samples can be run per day. Older analysis methods take one day per sample and involve complicated, expensive equipment. Insecticides left in excessive amounts on crops are likely to endanger those who eat the food.

Science News Letter, February 2, 1952

