

GENERAL SCIENCE

Change Science Teaching

Youth's image of science and scientists contains contradictions but the negative aspects of this image predominate, suggesting changes in science teaching.

► **DISCOVERING** through an extensive inquiry among 35,000 high school students that teen-agers imagine the scientist to be different from actuality, two scientists are recommending changes in science teaching to correct youth's image of a scientist.

Drs. Margaret Mead and Rhoda Metraux, reporting in *Science* (Aug. 30), suggest these changes:

1. Encourage more participation and less passive watching in the classroom, less repeating of experiments the answers to which are known. Give more chance to the students to feel they are doing it themselves.

2. Begin in the kindergarten and elementary grades to open children's eyes to the wonder and delight in the natural world, which can then supply the motive power for enjoyment of intellectual life later. This would also establish the idea of science as concerned with living things and with immediate, as contrasted with distant, human values.

3. Teach mathematical principles much earlier, and throughout the teaching of mathematics emphasize nonverbal awareness. Let children have an opportunity to rediscover mathematical principles for themselves.

4. Emphasize group projects; let the students have an opportunity to see science as team work, where minds and skills of different sorts complement one another.

5. Emphasize the need for the teacher who enjoys and is proficient in science subjects, irrespective of that teacher's sex. This would mean that good women teachers could be enlisted instead of depending on men, irrespective of their proficiency.

6. Change the teaching and counseling emphasis in schools which now discourages girls who are interested in science.

7. Deemphasize individual representatives of science, both outstanding individuals like Einstein—whose uniqueness simply convinces most students that they can never be scientists—and the occasional genius-type of child in a class.

8. Avoid talking about the "scientist," "science," and "the scientific method." Use instead the names of the sciences—biology, physics, physiology, psychology—and speak of what a biologist or a physicist does and what the many different methods of science are—observation, measurement, hypotheses-generating, hypotheses-testing, experiment.

9. Emphasize the life sciences and living things—not just laboratory animals, but also plants and animals in nature—and living human beings, contemporary peoples, living children—not the bones and dust of dead cities and records in crumbling manuscripts.

Dr. Mead, the anthropologist-author, and Dr. Metraux, research fellow at Cornell Medical College, compiled from essays written by high school students youthful ideas on science and the scientist. The image created by this compilation was often contradictory, but the negative aspects predominated.

The finding was that the image is likely to invoke a negative attitude as far as personal career or marriage choice is concerned.

Mass media—newspapers, magazines, radio, TV, etc.—should emphasize the real, human rewards of science, the fact that scientists work in groups and are neither "cogs in a machine," nor "lonely" and "isolated." The mass media, the scientists further recommended, could also help to break down the sense of discontinuity between the scientist and other men.

Science News Letter, September 14, 1957

PHYSIOLOGY

Dispute Adrenalin's Action

► **CURRENT THEORIES** about the control of the glycogen level in the body, a factor in diabetes, might be in error, scientists at the American Physiological Society meeting in Iowa City, Iowa, learned. (See p. 164.)

Evidence that adrenalin has one effect only, the breakdown of glycogen in muscle or liver, has been found in experiments with rats, Dr. Joseph E. Sokal, chief internist at Roswell Park Memorial Institute, Buffalo, N. Y., reported.

Stressing the findings are more a contribution to basic knowledge than to practical application, Dr. Sokal explained that the classical theory says adrenalin activates the enzyme phosphorylase to break down liver

glycogen into blood sugar. But, it also holds that the breakdown product of muscle glycogen, lactic acid, could overcome this effect. Lactic acid is the chemical associated with producing the sensation of muscle fatigue.

It was believed lactic acid and elevated blood sugar levels could force synthesis of liver glycogen in spite of the action of adrenalin.

Now, however, Dr. Sokal and his associate, Dr. Edward J. Sarcione, have found glycogen production was completely blocked by injection of adrenalin in doses which reached the liver. Thus, the scientists concluded, contrary to current theories, high levels of blood glucose and lactic acid

cannot force the synthesis of liver glycogen.

Glycogen is a long chain of glucose molecules bound together chemically. It is stored in the liver and there, breaks down into glucose, the blood sugar, which is released in the blood stream when needed to meet the body's energy requirements.

An understanding of adrenalin's action on glycogen is important to the understanding of carbohydrate metabolism, of which diabetes is an important disorder.

Knowledge of the mechanism may be valuable in studying von Gierke's disease.

This is a childhood disease causing the liver to become "tremendously" enlarged because of its inability to deplete stored liver glycogen by normal breakdown into the blood stream.

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PUBLIC HEALTH

Keep the Schools Open During a Flu Epidemic

► **KEEP THE** schools open this winter even if the threatened influenza epidemic hits the country.

This was one of the recommendations issued by state and territorial health officers who met with the U. S. Public Health Service, Washington. (See SNL, Aug. 10, p. 83.)

Schools and other public gatherings should not be curtailed since they will have little effect upon the spread of the epidemic. Some schools may have to close down, however, because of illness among their staffs, the officials advised.

Other recommendations were for the vaccination of infants, restriction of hospital admissions to complicated cases and the creation of a new National Commission on Influenza.

Infants should get two shots of the vaccine spaced one to two weeks apart and preferably given at three months of age when they begin receiving their other vaccinations.

Bad reactions due to egg sensitivity are unlikely, it was reported.

Uncomplicated cases of flu should not be placed in hospitals. If cared for at home, there will be less chance of the illness sweeping through hospitals and being acquired by personnel and other patients. Only those developing pneumonia and other conditions, or who have illnesses like heart disease that might be aggravated by the flu, should be hospitalized.

It was recommended that the U. S. Public Health Service establish a National Commission on Influenza. This would consider any current epidemic as well as the long-range problems of what virus strains may emerge in the next decade.

The military has already ordered about 6,000,000 cubic centimeters of the vaccine and plans to give all its personnel two doses instead of the one being recommended for civilians.

Although it was not certain that two doses would be better than just one, the military services want the additional protection since to maintain a state of readiness they cannot accept the same amount of disability as the civilian population.

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