A Simple Indication of the Efficacy of a Teaching Device

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Food from the Sun * is a vivid presentation of photosynthesis, including many ways living things respond to direct and indirect sunlight. It contains much basic physiological and organic chemistry, centered around foodstuffs, the manufacture and uses of sugars in particular. Although geared in appeal to secondary school or lesser levels it holds the attention of older people.

We are so conscious of light and its many influences that it is not unusual to find much general information at hand about the photosynthetic process. If there is anything about plants which students of general science or biology know in part when they arrive at college it is chlorophyll. Plant metabolism has received considerable attention. Chlorophyll-bearing structures are considered important.

At an annual session of NABT which covered teaching implementation an excellent talk was heard on the role of sugars in animal and plant life. *Food from the Sun* was shown, samples of the film strip being distributed. Two of the author's course objectives have been (a) to share with classes benefits gained from trips and meetings; (b) to review vital ideas previous to mid-year examinations. Therefore this series of still pictures was projected before General Biology students on the final day of formal first-semester work.

In the examination of the succeeding Friday, about 48 hours thereafter, 62 questions were asked, evaluated at 1–5 points each. The student selected for a total of 100 credits what he chose to answer. Inserted in the test was the following option: "What 4 facts or points do you recall from the film strip of Wednesday last?" Thirty-eight answered the question. Two mistakenly used a moving picture film on amoeba, shown previously, as the basis for reply.

Several times during the semester metabolism in chlorophyll-bearers was discussed. Some weeks, however, had passed since mention of it. A rather thorough consideration, therefore, was accorded the topic. From the papers only those statements specifically individual and clearly identifiable with the pictures seen are chosen. The broad idea itself could suggest facts, of course. But the stills are rather striking, full of action and color, well calculated to make lasting impress. Did they do so? Tabulation of the data shows topical summaries with number of times mentioned.

Sunlight, role and importance	21
Photosynthesis: nature of, importance	20
Carbohydrates: types, uses	18
Energy formation	12
Respiration	9
Water need, carbon dioxide use, sugar sources, 8 each	24
Growth in animals, plants	7
Oxygen loss	6
Making carbohydrates, proteins, fats	5
Brownies at work, storage regions, 3 each	6
Absorption, elements needed, sun's distance, speed of light, transpiration, plant organs, food-making, chlorophyll, 2 each	16
Animal health, animal dependency on plants, environment, chemical structure, osmosis, fermentation, tropical plant growth, leaf structure, food cycle, tropical plant size, protein from hen and cow, eggs and milk, plant work at night, 1 each	14
	157

Here are 34 items, reasonably exclusive, mentioned for a total of 157 times by 36 students, nearly the entire group. From this number 65 notations are selected on 20 special headings which could be considered as fairly indicative of retention of important items. The others are such that they could have been included merely from noting that the entire theme was photosynthesis with related phenomena.

A few matters recalled are of note. Two stated the exact time, 8½ minutes, required for light to reach the earth from the sun, a fact appearing beneath the fourth picture, with one recording 93 million miles as the sun's distance away. Three called attention to the "brownies" ("elves") as they busily formed carbohydrates. A lush scene of tropical vegetation was clearly remembered by two, one relating it to moisture, the other to a large aquatic leaf supporting the weight of a good-sized bird.

* Produced by Sugar Research Foundation, Inc., Box 137, New York 5, New York.

Another recalled the cold-blooded reptiles basking in the warm sun. Quite different was the model illustrating the molecular structure of sugar. A picture showing a hen associated with a nest of eggs, also a cow standing behind a bottle of milk, proved impressive. A boy, baseball bat over shoulder, delightedly eating a candied apple, probably incited the several mentions of quick energy yield with sugar, a fact to which the caption called attention. Some familiar, dynamic situations which would seem to have impressionistic value were definitely overlooked, however, for broader generalizations.

Yet for every representation neglected there were those which were clearly observed and retained. Therefore the great usefulness of this series of illustrations, originally and delightfully conceived and strikingly but scientifically labelled, is well shown for the group involved. The influence of previous lecturing and text-study was doubtless felt yet the figures and pictures must have etched prosaic data on the consciousness with a degree of greater clarity.

Biology in the News

He Lives on Ladybugs, by John Kohler, *Collier's,* Sept. 4, 1953, pp. 82–85.

Certain species of ladybugs are natural enemies of plant lice and other soft-bodied insects. How "Pappy" Quick collects and distributes millions of ladybugs to farmers makes interesting reading.

Poison in Your Kitchen by Joan Gould, *Today's Woman,* April, 1953, pp. 36–37 & 162–164.

Substances used in cleaning dishes and other household articles, kerosene, gasoline, paints and spot removers for clothing are responsible for the poisoning of thousands of children every year. This article urges preventive care of such substances and suggests what to do when poisoning happens.

Could You Be a Secret Tuberculosis Victim? by Albert Q. Maisel, *Woman's Home Companion,* April 1953, pp. 40–41 & 79–80.

How effective are the TB case finding procedures in your community? The reduced incidence of tuberculosis has led many into a false sense of security. We will never be safe as long as some active cases are at large.

You Should Know All This about Cancer by Peter Briggs, *Ladies Home Journal,* April 1953, pp. 52–53 & 127.

A series of questions commonly asked about cancer and the best accepted answers to them.

The Curious Case of the Shad by Robert Murphy, *Sat. Ev. Post,* April 18, 1953, pp. 36 & 199–202.

Dams prevent shad and salmon from going upstream to lay their eggs. As a result salmon have almost disappeared from Eastern waters. This is an account of some of the efforts being made to preserve the shad from a like fate.

Who's Winning the Battle of the Bugs? by Harold H. Martin, *Sat. Ev. Post,* April 18, 1953, pp. 42–43 & 169–170.

Man's fight with the insects goes on. As fast as we devise methods to destroy insects they develop an immunity to them. What we have accomplished and a few of the problems which need immediate solution are well presented.

Does Habitat Improvement Work? by Duward L. Allen, *Field and Stream,* Sept. 1953, pp. 50–51 and 95–98.

Animals need cover if they are to survive in a locality. By controlling plant succession, sportsmen can provide suitable habitats for the game they desire.