DISCUSSION

A SEX DIFFERENCE ENCOUNTERED IN THE TRANSPLANTATION OF A CARCINOMA OF THE OVARY[1]

A CARCINOMA of the ovary has been continued by subcutaneous transplantation since November 26, 1935.[2] During that time the tumor has been carried through twelve transfer generations. The first experiment consisted of implanting the tumor into one male and three females of the CBA strain—close relatives to the original mouse, which developed the neoplasm spontaneously. Two of the females and the male grew the implanted tissue progressively. In the second transfer generation eight females and four males of the same strain were inoculated with tissue from a mouse in the first experiment. Five of the females and all four of the males grew the tissue. Thus in the first two transfer generations seven out of eleven females grew the tissue, whereas all five of the males grew the implants they received from the same tumor. From the third through the twelfth transfer generations 162 additional mice of the CBA strain have been implanted. Of these 58 were females and 104 were males. One of the 58 female mice inoculated grew the tissue; all the 104 males grew the implant. The one female to grow the tissue occurred in the sixth transfer generation—the significance of which is still in doubt. Thus it appears that since the tissue has been established through two transfer generations it is now capable of growing only in the male mouse. A further genetic and endocrinological analysis of the observed sex difference will be forthcoming.

LEONELL C. STRONG
ROBERT T. HILL

A NEW SOURCE OF DIPHYLLOBOTHRIUM INFECTION

A COLLECTION of tapeworms from the intercostal muscles of *Natrix sipedon* taken near Ithaca, N. Y., on June 18, 1936, was given to the writer by Elmer E. Brown while at the University of Michigan Biological Station.

Recent examination of this material shows it to be a tangled mass of plerocercoids, eighteen in all. Seven complete specimens disengaged from the group range from 22 mm to 186 mm in length, with slit-like bothria which average 0.35 mm long and 0.113 mm wide. The broadest portion of the worms, at a distance of 0.437 mm behind the bothria, measures 1.312 mm. From this point they taper to a width of 0.612 mm at a distance of 0.35 mm from the posterior end. They have all the appearance of plerocercoids belonging to the genus Diphyllobothrium. This I believe to be the first record of a sparganum in snakes in the United States and I designate it as *Sparganum browni* n. sp.

Stiles[1] reported *Sparganum proliferum* from a man in Florida, and Moore[2] records *Sparganum mansoni* from a human case in Texas. Faust[3] found *Natrix tigrina* in the Orient harbored *S. mansoni*. Li,[4] in China, demonstrated other spargana in frogs and snakes to be the plerocercoids of *Diphyllobothrium erinacea* and *D. decipiens*. Recently, Mueller[5] has described *D. mansonoides* from cats in New York state.

Since *Natrix sipedon* is a great fish eater, a systematic examination of this snake and small fish from streams in the vicinity of Ithaca and Syracuse, N. Y., might disclose the source of the infection of water snakes with this sparganum. Live plerocercoids from such a source fed to cats may prove it to be *Diphyllobothrium mansonoides, D. mansoni* or a new species.

LYELL J. THOMAS
UNIVERSITY OF ILLINOIS

THE EFFECT OF LIGHT ON THE VITAMIN C OF MILK

THE interesting article on vitamin C in pasteurized milk by Professor Sharp[1] prompts me to describe here very briefly the results of the work on the vitamin C of milk which has been carried out at our institute during the last few years. A full account of the work[2] will appear in the last number of the current volume of the *Biochemical Journal*. I think, however, that a summary of the salient points will not be amiss here, because I believe that our observations provide a satisfactory explanation of several problems raised by Professor Sharp. They are also, I hope, of general interest.

In estimating vitamin C chemically in milk by the method of Birch, Harris and Ray,[3] I[4] observed very marked fluctuations in the concentration of that vitamin from day to day. The possible causes of this phenomenon were investigated by Mattick and myself,[5] who ultimately found that milk which originally gave a positive vitamin C titration failed to reduce the indophenol reagent after a short exposure to light in

[1] From the Department of Anatomy, Yale University School of Medicine. Aided by grants from the International Cancer Research Foundation and the Anna Fuller Fund. Acknowledgment is made to the Fluid Research Fund of Yale University.

[2] "Endocrinology" (in press).

[1] C. W. Stiles, *U. S. Hyg. Lab. Bull.*, 40: 1–18, 1908.
[2] J. T. Moore, *Amer. Jour. Trop. Diseases*, 2: 518–525, 1915.
[3] E. C. Faust, "Human Helminthology," 1929.
[4] H. C. Li, *Amer. Jour. Hyg.*, 10 (3): 527–550, 1929.
[5] J. F. Mueller, *Jour. Parasit.*, 21 (2): 114–121, 1935 and 22 (5): 471–478, 1936.

[1] SCIENCE, 84: 461, 1936.
[2] By S. K. Kon and M. B. Watson.
[3] *Biochem. Jour.*, 27: 59, 1933.
[4] S. K. Kon, *Nature*, 132: 64, 1933.
[5] *Nature*, 132: 446, 1933.

glass bottles. Some time later Booth and Kon[6] showed that the power to reduce the reagent could be restored to an extent varying with the length of exposure to light by treating the milk with hydrogen sulfide. The further detailed study by Kon and Watson yielded the following information:

Under the action of light the ascorbic acid of milk undergoes reversible oxidation, most probably to dehydroascorbic acid. Visible light of short wave-length (blue and violet) is mainly responsible for the reaction. Ultra-violet light is also probably active, but yellow and red are almost without effect. The action of light does not take place in the absence of oxygen, and the reversible oxidation follows the laws of a unimolecular reaction. The reversibly oxidized product is biologically active. The product suffers further decomposition spontaneously, without the agency of light, giving a substance which fails to decolorize the indophenol reagent even after treatment with H_2S and is devoid of biological activity. This reaction does not run to completion. Synthetic ascorbic acid added to milk behaves, under the action of light, in the same way as the ascorbic acid originally present.

Pasteurization by the holder method destroys the reversibly oxidized, but does not affect the reduced, form of ascorbic acid in milk. Milk, as secreted by the normal cow, contains only reduced ascorbic acid. The amount of destruction of vitamin C caused by pasteurization in the absence of catalytic metals (copper) depends on the previous exposure of the milk to light.

S. K. KON

NATIONAL INSTITUTE FOR RESEARCH IN DAIRYING
UNIVERSITY OF READING, ENGLAND

FISH IN THE LATAH FORMATION OF IDAHO

THE purpose of this notice is to bring to the attention of vertebrate paleontologists the existence of fish skeletons in the Latah formation.

In May, 1936, Dr. R. L. Lupher conducted a field trip along the Clearwater River for his class in historical geology. The writer was very pleased to accompany the class as a guest. One of the stops was at a road cut, on the north bank of the river, eleven and one half miles east of Lewiston, Idaho, in T. 36 N., R. 4 W., Boise Meridian. This seems to be the collecting locality called Station 4 by Kirkham and Johnson,[1] who found at least twelve species of plants, which were later described by Berry.[2] Here the Latah beds strike N. 85° W. and dip 20° W. They are composed of yellow and porcelaneous white shale with an eight-inch bed of gray volcanic ash passing through the center of the outcrop.

Fragmentary remains of fish were found by several members of the party. Messrs. J. Bone, A. O. Huhn, M. Morsing and J. Storall uncovered three complete skeletons, which they kindly presented to the writer. Since the first discovery the writer has visited the outcrop twice and both times has found fish remains. The skeletons are from four to six inches long and have been determined temporarily as belonging to the genus *Leuciscus*. Accurate determinations, as yet, have not been made. One slab, measuring ten inches by fourteen inches, has yet to be uncovered.

Dr. F. B. Laney[3] has found bone fragments, and Berry[2] has noted occasional scales, spines and bones in the Latah formation; but, so far as the writer is able to ascertain, this is the first discovery of complete and articulated fish skeletons. Although these skeletons are from only one locality in Idaho, the writer is confident, because of the fine grain of the clay-shale and the excellent preservation of plant remains, that more diligent collecting will uncover many such skeletons in the Latah formation of both Idaho and Washington.

VERNON E. SCHEID

UNIVERSITY OF IDAHO

THE PROTECTION OF PLANTS

RECENT experience[1] shows that the effect of poison-sprayers (arsenic, copper, lead, etc.) is found to extend much beyond its immediate objective, namely, the protection of crops against parasitic attacks.

Apart from its inability to discriminate between friend and foe, this treatment represents in its cumulative poisoning action upon the soil a grave danger to future plant life both by (a) its inhibition of growth and (b) the introduction of toxic constituents into plant metabolism. A greater stress upon the augmentation of the plant's natural means of protection, such as sanitation, nutrition and stock selection, might perhaps lessen the recourse to these artificial protective means.

Now from the work of Greenbank[2] on the inhibition of rancidity in fats and oils (with a possible extension to cereals) by maleic acid, and that of Copisarow[3] on (a) the bactericidal and fungicidal properties of maleic acid, (b) the close chemical and physiological resemblance, if not identity, of maleic acid with the natural

6 *Nature*, 134: 536, 1934.

1 V. R. D. Kirkham and M. M. Johnson, *Jour. Geology*, 37: 483–504, 1929.

2 E. W. Berry, *U. S. Geol. Survey Prof. Paper 185*, pp. 97–125, pls. 19–24, 1934.

3 Oral communication.

1 Report of the American Society of Plant Physiologists, Western Section, SCIENCE, 84: 171, 174, 1936.

2 Greenbank, U. S. Pat., 1898, 363, Feb. 21, 1933; SCIENCE, 77: *Suppl.*, page 6, February 24, 1933.

3 Copisarow, *Jour. Pom. Hort. Sci.*, 14: 9, 1936.