some of the "passwords" which will take us across the "technical and arbitrary . . . frontiers that exist between the studies of heredity, development and infection."[11] That these frontiers are already being crossed by means of enzyme techniques is apparent from the work of Spiegelman and Lindegren[11,12] who have shown that the melibiose-fermenting enzyme in yeast could be maintained and reproduced in the *absence* of the gene necessary for its *initial* synthesis. Thus we have an example of the autosynthesis which forms the basis of the competition between enzyme X and cancer protein in the enzyme-virus theory of cancer.

The novelty of the writer's theory of cancer does not lie in its use of the word virus. There was already a virus theory of cancer, just as there was an irritation theory, a genetic theory, a hormone theory and many others. However, the individual theories did not explain the facts which were used to support the alternate theories. The final theory must satisfy not only the biologist, but also the chemist and physicist; it must explain all the facts and in so doing will be not only a theory of cancer but a theory of life.[2] The keystone in the whole structure appears to be the identity or non-identity of the enzymes (*sic*) with the terms used by the other specialists. That is, each genetic factor not only produces a character in an ultimate time-space continuum that can be recognized visibly by the biologist, but it must also produce a chemical reaction that is recognizable here and now on a chemical basis. The need in this work is not for interpreters but for specialists who are at least "bilingual." In the latter case we naturally emphasize the importance of the language of the enzymologist.

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THE EFFECT OF OXALATES IN THE DIET

IN the March 16 issue of SCIENCE Roe E. Remington and Cecil L. Smith give superficial observations on feeding a commercial preparation (spintrate) and attempt, without basis, to throw new light on the effect of spinach in the diet. At the same time, they give a wrong impression of the established and published data of Fincke and Sherman which they cite[1] and of others[2] which they ignore, regarding the occurrence of oxalic acid and its effect on calcium utilization, by the following statement: "Since it has been reported that there is some substance, *presumably oxalic acid,* (italics not theirs) which interferes with the utilization of calcium for bone formation. . . . "

The occurrence of oxalic acid and oxalates in spinach (and in other foods) is not on a "presumptive" basis, as any one who is versed in food chemistry well knows. That the oxalates in spinach have no effect on rat growth or bone formation, if the diet contains adequate calcium to stoichiometrically match the oxalate in addition to the normal calcium requirement, has been fully demonstrated, as Remington and Smith could have ascertained if they had familiarized themselves with the literature.

By not going to the trouble even to give the oxalate and calcium contents of their diet they have presented confusion, not enlightenment. If "spintrate" represents dehydrated spinach, it is likely that it has been blanched, since that is the usual practice in dehydrating vegetables. In that case the oxalates other than calcium oxalate, because of their solubility, are largely extracted, as are other water-soluble components, and the remaining calcium oxalate is practically inert. As an average figure the calcium oxalate in spinach constitutes only about one third of the oxalate content.

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CAMPBELL SOUP COMPANY,
CAMDEN, N. J.

1 M. L. Fincke and H. C. Sherman, *Jour. Biol. Chem.*, 110: 421, 1935.

2 B. W. Fairbanks and H. H. Mitchell, *Jour. Nutrition*, 16: 79, 1938; F. F. Tisdall and T. G. H. Drake, *Jour. Nutrition*, 16: 613, 1938; E. F. Kohman, *Jour. Nutrition*, 18: 233, 1939.

"ANGRY" MOSQUITOES

A REPORT by Kahn, Celestin and Offenhauser recently published in SCIENCE[1] contains some very interesting and potentially significant observations regarding the sounds produced by mosquitoes. The data concerning species differences, sex differences and effects of interindividual stimulation are particularly instructive.

Inasmuch as the authors indicate their intention to continue their investigational program, and therefore presumably to publish more extensively, it may not be amiss to enter a plea for more careful and objective treatment of the psychological phenomena involved. In the article under consideration it is suggested that the calls of mosquitoes "may be in the nature of (a) mating calls, (b) calls warning of danger, (c) calls of anger and other sounds that are similarly functional."

Serious students of animal behavior have long been aware of the dangers of interpreting the reactions of a lower species in terms of psychological experiences characteristic of human beings. The facile process of imputing human motives and feelings to other forms and thus "explaining" observed behavior is rightly discouraged.[2] Such a procedure necessitates certain assumptions which are rarely made explicit, and are often unrecognized even by their author. To

1 M. C. Kahn, W. Celestin and W. Offenhauser, SCIENCE, 101: 335, 1945.

2 T. C. Schneirla, *Jour. Comp. Psychol.*, 34: 79, 1942.