8. *Independence of wind.* In the absence of wind, band slicks are not visible because there are no ripples, but floating objects are often observed to be marshalled in long rows at the sea surface. As soon as the wind arises it is seen that slicks form along these rows. At wind velocities less than about 3.5 m per sec the orientation of the slicks is independent of wind direction.

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β-3-Thienylalanine, an Antiphenylalanine in the Protein-depleted Rat[1]

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Most studies of the effects of amino acid antagonists on mammalian metabolism have been made with young growing rats (*1, 3*). Since the protein-depleted rat regains weight rapidly on a synthetic diet containing all the essential amino acids (*2*), it seemed to us that this uniformly selected animal should be useful for the study of amino acid antagonists. At this time we wish to report the effect of β-3-thienylalanine (β-3-TA) on the recovery of the protein-depleted rat.

TABLE 1

COMPOSITION OF BASAL (MEA) DIET

	%		%
Dextrin	61.14*	Essential amino acids†	3.93
Corn Oil	4.00	Nonessential amino acids‡	4.93
Fiber	5.00	Vitamins in dextrin	1.00
O-M Salt Mix§	4.00	Water	16.00

* Various addenda were made by reducing the content of dextrin by a corresponding amount.

† Composition of the essential amino acids in this mixture was: L-histidine-HCl, 4.91%; DL-isoleucine, 20.69%; L-leucine, 12.29%; L-lysine-HCl, 13.49%; DL-phenylalanine, 7.63%; DL-threonine, 14.58%; DL-tryptophane, 2.47%; DL-valine, 17.30%; DL-methionine, 6.62%.

‡ Composition of the nonessential amino acids in this mixture was: DL-alanine, 11.71%; L-arginine-HCl, 10.37%; DL-aspartic acid, 13.17%; L-cystine, 0.75%; L-glutamic acid, 49.57%; glycine, 1.06%; and L-tyrosine, 13.37%.

§ Osborne and Mendel salt mix.

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Albino male rats of the Sprague-Dawley strain with initial weights varying from 211 g to 227 g were selected. They were depleted of protein according to procedures previously described (*5*), and selected for the experiment when their weight loss was between 26% and 35%. During the first two days of the experimental period all animals in individual cages were offered 15 g of the basal diet containing the minimum amounts of the essential amino acids required for optimum restoration of lost weight (*4*). The composition of this diet, designated MEA, is given in Table 1. After two days on the MEA diet, 12 rats were divided into four groups of three animals each. Each animal in the four groups received the dietary treatment as outlined in Table 2.

TABLE 2

DIETARY TREATMENT OF EACH GROUP OF RATS

Group 1	MEA for 10 days.
Group 2	MEA for 2 days; MEA plus 90 mg phenylalanine for 8 days.
Group 3	MEA for 2 days; MEA plus 50 mg β-3-TA for 1 day; MEA plus 25 mg β-3-TA for 2 days; MEA plus 25 mg β-3-TA and 90 mg phenylalanine for 5 days.
Group 4	MEA for 2 days; MEA plus 200 mg β-3-TA for 2 days; MEA for 2 days; MEA plus 25 mg β-3-TA for 4 days.

The average changes in body weight of each group of animals are plotted in Fig. 1. It may be seen that the animals of groups 1 and 2 gained equal amounts of body weight, indicating that twice the level of phenylalanine did not alter the weight restoration.

The addition of 50 mg of β-3-thienylalanine to the diet resulted in a loss of weight and a decrease in appetite. All animals continued to lose weight when the amount of β-3-TA was reduced to 25 mg per 15 g of diet. When 90 mg of phenylalanine was added with 25 mg β-3-TA, all

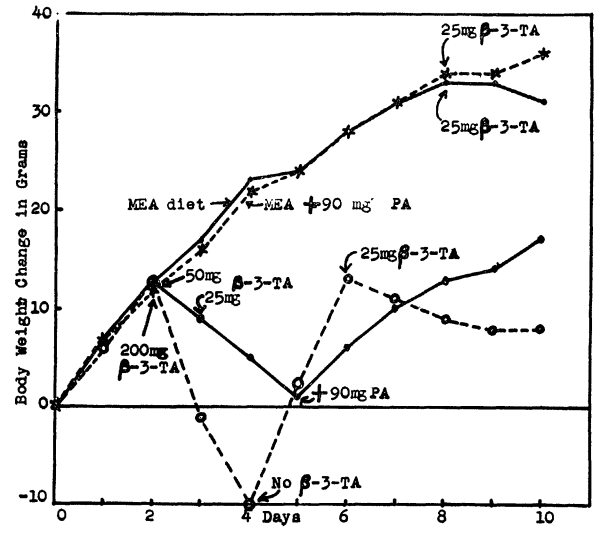

FIG. 1. Curves showing the average changes in body weight of four groups of animals, illustrating the antiphenylalanine properties of β-3-thienylalanine (β-3-TA) in the protein-depleted rat.

three animals in group 3 gained weight equal to the optimum response of the control group 1.

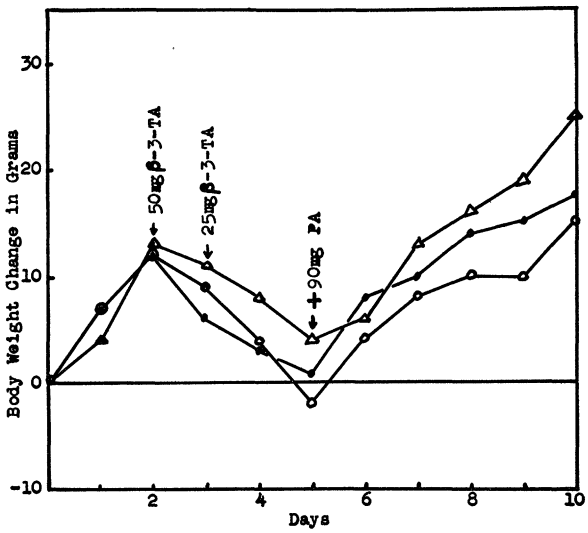

FIG. 2. Curves showing the changes in body weight of each rat in group 3, illustrating the uniform response of each animal.

When 200 mg of β-3-TA was incorporated into the daily diet of each rat in group 4, the loss in weight was very dramatic. The loss was much greater than would result from removal of all phenylalanine. After two days of 200 mg of β-3-TA, the three animals of group 3 were returned to the MEA diet without antagonist. All three rats recovered weight rapidly, indicating that this level of β-3-TA did not produce an irreversible toxic effect. On the sixth day of the experiment the animals of group 4 were again offered a diet containing 25 mg of β-3-TA. The addition of the antagonist at this time again resulted in a loss of weight.

The data plotted in Fig. 1 clearly demonstrate that β-3-thienyl-DL-alanine inhibits the metabolism of phenylalanine during the recovery of the protein-depleted rat.

In Fig. 2 the response of each animal in group 3 is plotted to show that all animals responded quantitatively in a uniform manner. The same consistent data were obtained in each group.

In summary, β-3-thienylalanine inhibited the weight restoration of the protein-depleted rat; this inhibition was completely prevented by additional amounts of phenylalanine.

The results of this experiment indicate the suitability of the protein-depleted rat for the study of amino acid antagonists. Complete results can be obtained in ten days.

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Book Reviews

Fishes of the Western North Atlantic: Lancelets, Cyclostomes, Sharks. (Memoir, Sears Foundation for Marine Research, No. 1.) Henry B. Bigelow, Isabel P. Farfante and W. C. Schroeder. New Haven, Conn.: Sears Foundation, Yale University, 1948. Pp. 576. (Illustrated.) $10.00.

This is the first volume of the *Fishes of the western North Atlantic* and the first attempt in half a century of American ichthyologists to cooperate in preparing a comprehensive descriptive account of fishes. The present work covers the western half of the North Atlantic, including gulfs, seas, and bays, from Hudson Bay southward to the Amazon River. Brackish water species are included, and others close to the borders, when they make for a more adequate understanding of the group. The reports on the three groups of fishes treated may be classed as critical reviews or revisions. Under each species is found a detailed description, including distinctive characters, color, developmental stages, size, habits, abundance, range, relation to man, and occurrence in the Western Atlantic. Each species (with one or two exceptions) is illustrated by an accurate outline drawing. As complete a list of synonyms and references as possible is found under each species.

During the past decade, while this study has been in preparation, I have been in touch with the authors and have observed their careful methods of study, and deliberate and painstaking care in the preparation of this big volume. There are few typographical errors and only minor inconsistencies. This indicates a great amount of work and careful editing. Thus ichthyologists may place much confidence in the work.

The classification and nomenclature is conservative. The authors are to be highly complimented in not accepting or changing scientific names of sharks in general zoological use for a century or more. In preparing keys to the genera and species they have included genera outside the North Atlantic and have based their judgment on a world-wide basis. Many of the keys include all of the known species of that particular genus, with the range given for each species.

The volume is beautifully prepared from the point of view of bookmaking in regard to size and style of type, arrangement, and organization. If future volumes are as well done, the committee in charge may justifiably be very proud.

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