included those data from fishes having a recent thermal history that was entirely below 16° C. During the several weeks prior to and throughout that period the water temperature was rising steadily but did not fluctuate to any great extent. Period I extended from 5 November to 10 December 1962. Period II extended from 11 December 1962 to 12 February 1963 and, as the graph shows, was a time of high and extremely variable temperatures. From 13 February to 4 March 1963, sampling was suspended. Period III included 5 March to 25 April 1963, and was one of falling temperatures and minimal fluctuations.

The data were treated to consider oxygen consumption as a function of temperature and body size. A multiple regression was calculated for the data on each species for each of the three study periods. The equation,

$$Y = a + b_1X_1 + b_2X_2,$$

was used. Y represents the log estimated oxygen consumption in ml./gm./hr. The Y intercept, a, is the log. estimated oxygen consumption in ml./gm./hr. at 0° C., by a fish weighing 1.0gm. The variable, X_1, is the temperature in degrees C., X_2 is the log weight (gm.) and b_1 and b_2 are their respective partial regression coefficients. Statistical significance of each equation was determined by analysis of variance and of each partial regression coefficient (b_1 or b_2) by *t* tests. Statistical procedures are from Mather (1951).

The species selected for study were:

Forsterygion capito (Jenyns)
Forsterygion varium (Bloch & Schneider)
Forsterygion robustum (Clarke)
Pseudolabrus celidotus (Bloch & Schneider)

For each of the four species there is a graphic presentation of the metabolic rate-temperature curve for each of the periods of study. These appear in Fig. 4 and are representative of specimens of mean weight of the respective samples. Corrections were made for weight according to the partial regression coefficient. Since in some cases one or the other of the partial regression co-efficients (b_1 or b_2) was not statistically significant, these rate-temperature curves illustrated can be considered only as approximations of actual conditions of the samples.

The choice of species gave three closely related ones which it was hoped would yield information on the degree of consistency of metabolic performance within a narrow phylogenetic group. It has long been recognized that ecological evolution has not always paralleled phylogenetic lines and that within any given taxon there may be an extensive proliferation of ecological types. These trypterygiid fishes occupy habitats similar to those occupied by a number of species of Cottidae which I have studied at approximately the same latitude (ca. 45°) North. A comparison of these two groups was of particular interest. *Pseudolabrus celidotus* was chosen for study because of its great numbers and apparent success. Since it appears to be of rather recent tropical origin and has so successfully invaded high latitudes, I considered it likely that it might show something unusual in its metabolic rate-temperature relationships.

RESULTS

Forsterygion capito

Table 1 lists information relating to *F. capito*. As regards size, there are large negative coefficients in Periods II and III. However, the great amount of scatter, reflected in the large standard errors, renders size of no statistical significance in influencing metabolic rate.