effect of crowding by other organisms since there is little change in diameter with increasing height. In the latter case the opposite is true, there is little change in height as the diameter increases; with these large and presumably old barnacles at a very high and exposed level this would seem to be the result of abrasion. With these exceptions the appropriate regression lines of heights on diameter have been calculated and are also shown in the Figures.

It is a simple matter to test whether a set of samples can be considered to be drawn from a population having the same regression. The difference between the residual sums of squares of the combined regression line and those of the separate lines divided by the difference of the degrees of freedom is an independent estimate of the variance which may be compared with the residual variance from the separate regression lines.

Applying this test it is found that all the samples from the various levels of each form considered separately have a common regression line, i.e. for each form the relation between diameter and height is the same at all levels. However, when the common regression lines for the 2 forms (pooling all the individual results) are compared they are found to be significantly different.

A common regression line for all levels for either form suggests that the relation is little influenced by environment and together with the significant difference between the common regression strengthens TENERELLI's separation of the species into 2 distinct varieties.

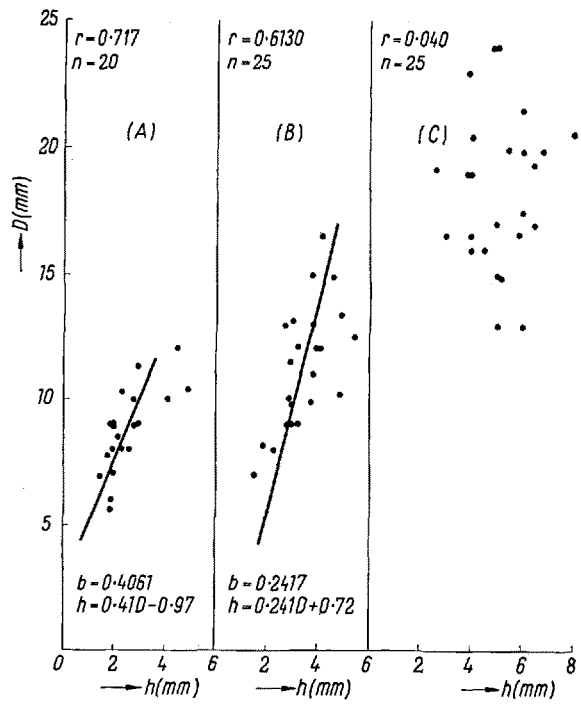

Fig. 2.–Plot of diameter (D) against height (h) for *Chthamalus stellatus depressus* (Poli). Data from TENERELLI: (A) Zona intercotidale, vicino alla linea superiore di alta marea. (B) 40–50 cm sulla linea superiore di alta marea. (C) 180–260 cm sulla linea superiore di alta marea. Correlation and regression lines are shown.

It is also of interest to note that, whilst the pooled regression lines are significantly different, this difference is one of position and not slope (Fig. 3); the rate of change of height with diameter is not significantly different. It appears from Figure 3 that the relation in the case of the form *depressus* is linear throughout life since production of the regression line gives values

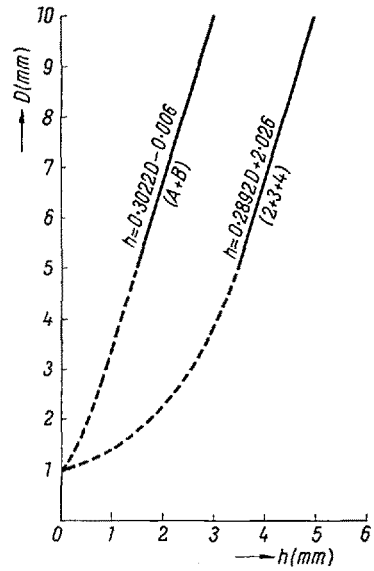

Fig. 3.–The common regression lines for the 2 forms *stellatus* (*2*, *3*, *4*) and *depressus* (*A*, *B*). Regression lines produced to show necessary change of slope in *stellatus*.

roughly equivalent to those expected in the newly settled animal; in the case of the form *stellatus* the same argument suggests that a change in the diameter-height relation takes place between settlement and a value of 5 mm for the diameter.

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The Marine Station, Millport, Scotland, November 7, 1955.

Résumé

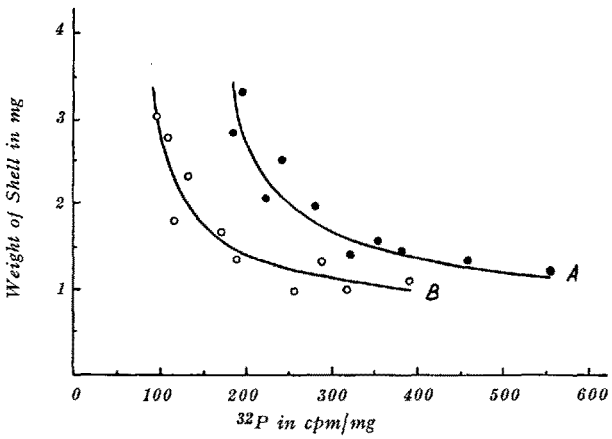
Les données de TENERELLI sur les dimensions (hauteur et diamètre basal) de *Chthamalus stellatus stellatus* (Poli) et *C. stellatus depressus* (Poli) sont analysées ici par des méthodes statistiques. On peut constater une ligne de régression commune à tous les échantillons de chaque sous-espèce, pris à plusieurs niveaux. Les lignes de régression pour les deux sous-espèces en question offrent des différences significatives. Leur croissance diffère également.

The Exchange of Phosphorus in Shells of the Aquatic Snail *Physa acuta*

Many authors have been able to demonstrate by using radioactive isotopes the exchange of phosphorus and calcium in bones of higher animals. It therefore was of some interest to find out whether similar exchanges of important biogenic elements occur in the shells of some mollusca. Concerning generally the problem of basal metabolism of phosphorus in the aquatic snail *Physa acuta*[1] cultivated in our laboratory, we performed some experiments where finally a relatively intensive

[1] These studies were part of our research on the mode of action of molluscacidal substances on the snail's metabolism.

exchange of phosphorus in the shells of these mollusca could be determined. It was mainly the P-metabolism of growing animals which was studied in our experiments. Thus we found, e.g. with the type *Physa acuta*, that approximately 50% of the accepted ^{32}P-isotope changes in its shell in the course of 5 days. A rather peculiar observation was made that the percentage of the ^{32}P exchanged in the shells was the same, even though individuals of different shell-weight, and thus of different age, were used. At the same time the absolute quantity of the bound ^{32}P was indirectly proportional to the shell-weight, i.e. the ligther the shell the more ^{32}P was bound by it. This phenomenon can easily be explained by the more intensive metabolic activity of young growing animals. The following Graph shows the uptake of ^{32}P in 5 days (*A*), and at the same time its exchange during the following 5 days (*B*), in shells of the *Physa acuta*.



cpm/mg = counts per min per mg weight of snail-shell.
Controls performed with shells containing no animal did not show any significant uptake of radiophosphorus during 5 days.

Methods.— 20 young mollusca of different size were grown for 5 days in a medium (100 ml of tap-water from which Cl_2 were eliminated) containing 1 μc/ml ^{32}P (obtained by neutralization of H_3PO_4 by NaOH). After 5 days all the animals were taken out of the medium and washed briefly with distilled water 10 times until the distilled water showed no more radioactivity. 10 of them were killed in boiling distilled water, the bodies were shelled and the shells, after washing 3 times with distilled water, dried at 60° for 24 h (the part of shells designated with *A* in the Graph). The other 10 animals, after 1 h in pure tap-water, were transferred to the same jar under the conditions described above, but without any ^{32}P. After 5 days, these 10 snails were killed and dried in the same manner as is described above (the *B* group in the Graph). Then the shells of both groups were weighed and ground to powder, and the activity of 1 mg of the shell-powder was estimated with a G.M. counter.

Because it is well known that phosphorus does not belong to the basal building material of the mollusca-shell, our experiments seem to confirm the old conception of phosphorus being the agent which transfers calcium to the shells[1]. This conception supposes in principle that calcium is transferred to the organic layers of the shell, perhaps as soluble calcium diphosphate, and there this crystallized compound is readily changed into calcium carbonate, the real building matter of the shell. Phosphate is then brought back to the normal snail metabolism. If this conception were right, then the whole calcium transfer by means of phosphorus would be far more complicated than is usually supposed in the ossification of mammals[2].

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Institute of Microbiology, Faculty of Medicine, University of Brno, Czechoslovakia, May 25, 1956.

Zusammenfassung

In Schalen von wachsenden Wasserschnecken, *Physa acuta*, wurde binnen 5 Tagen 50 % Austausch des Radiophosphors ^{32}P beobachtet. Auch wurde festgestellt, dass das absolute Quantum des ^{32}P, der binnen 5 Tagen aufgenommen wird, indirekt proportional dem Schalengewicht ist, das heisst, je schwerer die Schale ist, desto mehr ^{32}P wird aufgenommen.

[1] H. SIMROTH and M. HOFFMANN, in: *Dr. H. G. Bronn's Klassen und Ordnungen des Tierreiches*, III. Bd. (Mollusca), II. Abt., 2. Buch (1928), p. 192.

[2] TH. BERSIN, *Kurzes Lehrbuch der Enzymologie*, 4. Aufl. (Akad. Verlagsges., Leipzig 1954), p. 297.

Streptomycin and Endocrine System

In a previous work[1] we published data that streptomycin and inositol (which forms a part of the streptomycin molecule), injected into healthy rabbits produces a rise in the neutral blood fat content; and the same is seen, though in a lesser degree, in persons treated with the therapeutic dose of streptomycin.

We believed that it is mainly the function of one or several members of the hypophyseal-hypothalamic-adrenal system which should be considered as probable cause of the changes in the fat metabolism which we established. This assumption can be sustained by several clinical observations described in the complications of streptomycin treatment as the manifestation of hypertrichosis (FONÓ[2]), the appearance of striae atrophicae (BOQUIEN and others[3]), hyperglycaemia, acne, retention of sodium, the decrease of the number of circulating eosinophils and lymphocytes (BARNARD[4]), signs which may also develop as clinical features of different endocrine disorders.

Recently KÁROLYHÁZI[5] in our clinic found that the diabetic state in alloxan induced rats was significantly deteriorated by the administration of streptomycin.

To elucidate the mechanism of this action of streptomycin, systematic researches were begun with the investigation of the possible changes in the function of the anterior pituitary.

The first experiments were performed on 12 healthy rabbits kept on the same diet, and the changes of the dextrose, dextrose + insulin, dextrose + insulin + vitamin B_1 and finally dextrose + vitamin B_1 tolerance tests were determined before and after treatment. The resul-

[1] L. MOSONYI *et al.*, Lancet 2, 81 (1951); Wien. Z. inn. Med. *33*, 384 (1952).
[2] R. FONÓ, Orv. Lapja *5*, 515 (1949).
[3] Y. D. BOQUIEN *et al.*, Bull. Soc. méd. Hôp. Paris *1948*, 852.
[4] R. BARNARD, Lancet *1*, 612 (1952).
[5] GY. KÁROLYHÁZI, Orv. Hetil. *94*, 34 (1953).