Since effects of either antiserum on thymocytes and lymphocytes in vitro as determined by agglutination test showed no significant difference, the observed difference in effect on lymphopenia and prolongation of allograft survival time between these serums must depend on factors other than the agglutinins. Thymectomy in adult animals has relatively little effect on immunological competence unless peripheral lymphoid tissues are destroyed simultaneously, for instance, by lethal irradiation (*3*). Histological examination of the animals receiving antiserum to thymus showed depletion of small lymphocytes in the thymus glands, whereas thymus glands in animals receiving antiserum to lymphocytes remained intact. It seems, therefore, that treatment with antiserum to thymus results in an equivalent of thymectomy plus irradiation.

Antiserum to thymus, however, has several advantages: (i) no surgical intervention is required; (ii) lymphopenia and desired effect can be regulated by adjusting the dose of the serum; (iii) anemia or neutropenia inherent to irradiation are usually not present. Since thymic humoral factor is the only stimulus known for the production of thymocytes (*4*), depletion of thymocytes and the resulting interference with allograft rejection may be mediated by antibody to the thymic humoral factor.

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Iodine: Accumulation by Balanoglossus gigas

Abstract. *The whole body of the giant Brazilian enteropneust,* Balanoglossus gigas, *shows an accumulation of iodine, but the concentration in the hepatic region is 854.7 percent higher than it is in the proboscis, where the amount of iodine is the lowest. Such an iodine concentration has not yet been detected in any other enteropneust or protochordate.*

Balanoglossus gigas is the largest enteropneust known; it was rediscovered by Sawaya (*1*) on certain shores in Brazil (Araçá, in the state of São Paulo, 23° 48′7″S and 45° 23′29″W; Gambôa, in the state of Santa Catharina, 27° 22″S and 48° 32″W).

Enteropneusts are animals which characteristically produce a copious secretion of mucus, which has a pervading odor reminiscent of iodoform. These organisms live in the intertidal zone, and they burrow long galleries, ingesting sand; this material is expelled by the intestine, and it accumulates at the posterior opening of the gallery in the form of spiral casts.

The whole body of the animal, the mucus, and the casts have the strong smell mentioned above; yet, in spite of several analyses, iodoform has not yet been detected.

The animals are of considerable size (up to 2 m in length). Hence, in order to detect any possible differences in iodine content in regions of the body, some regions were subdivided artificially into two or three subregions, excluding the proboscis and collar. From the branchial region we made two subregions (I and II), and from the genital, hepatic, and intestinal regions we made three (I, II, and III in each case). Only the hepatic and intestinal subregions can be differentiated easily by color: I is dark brown; II is light brown; and III is rosy.

The total iodine content of the mucus (fresh material) and the several regions and subregions of the body (dry weight) of four adult animals was determined (*2*), and the results are listed in Table 1.

The whole body shows an accumulation of iodine, but the concentration in the hepatic region is 854.7 percent higher than it is in the proboscis, where the amount of iodine is the lowest (116.7 μg/100 g).

The total iodine content in the fresh mucus from the four animals was 8.3, 7.5, 8.0, and 7.8 μg/ml (mean, 7.9 μg/ml; SD = ±0.41).

These results lend support to the hypothesis that the hepatic region has a thyroid-like function. Such an iodine concentration in that region is noteworthy and, as far as we know, such amounts have not yet been detected in any other enteropneust or protochordate.

The protochordates, to which the enteropneusts belong, are very close to the chordates, and despite the contentions of Van der Horst (*3*) and Hyman (*4*), some authors retain the enteropneusts in the phylum Chordata (*5*). Some protochordates—for example *Ciona* in the urochordates and *Branchiostoma* in the cephalochordates—are provided with the endostyle, an organ in which the concentration of iodine is high (*6, 7*). Several authors (*5, 6, 9*) state that the endostyle is the precursor

Table 1. Total iodine content in different regions of the body of *Balanoglossus gigas.*

Body region	Iodine (μg/100 g, dry wt.)*				
	No. 1	No. 2	No. 3	No. 4	Mean ± S.D.
Proboscis	163	101	97	107	116.75±30.94
Collar	217	226	218		220.00± 4.12
Branchial I	274	282	276	266	274.50± 6.60
Branchial II	479	480	473	477	477.50± 3.10
Genital I	385	368	366	337	364.00±19.86
Genital II	377	393	377	391	384.50± 8.83
Genital III	457	503	450	502	478.00±28.40
Hepatic I	855	844	876	880	876.25±13.24
Hepatic II	1039	971	984	996	997.5 ±23.09
Hepatic III	896	966	936	935	933.25±28.62
Intestinal I	601	597	596	623	604.25±12.68
Intestinal II	360	358	340	338	349.00±10.50
Intestinal III	342	350	356	392	360.00±22.09

* Four animals were used.

of the thyroid gland of vertebrates, but in the opinion of others (*8*) the endostyle does not have special importance as a synthetic center for thyroactive materials.

Balanoglossus gigas, like other enteropneusts (*9*), does not have such an organ, but according to Gorbman, Clements, and O'Brien (*10*) iodine is present in some groups of cells in the epidermis of *Saccoglossus kowalewsky;* Thomas (*5*) found the same to be true for *S. apantesis.*

Barrington and Thorpe (*11*), using chromatographic methods and I^{131}, have shown that the whole body of another enteropneust—*Saccoglossus horsti*—concentrates some amount of 3-monoiodotyrosine. Histological preparations of the hepatic region of *Balanoglossus gigas* show several intraepithelial glands with homogenous cytoplasm that looks like the colloid substance of thyroid follicles. The hepatic region of *Balanoglossus* is a rather difficult material for histological preparations; the tissues disintegrate rapidly when out of sea water. We expect, however, that autoradiography and chromatography with I^{131} may result in separation of the iodine bound to protein.

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Phosphatase Mutants in Aspergillus nidulans

Abstract. *Three mutants at three different phosphatase loci produce inactive enzymes at 35°C but partially or fully active enzymes at 25°C. Furthermore, a suppressor mutant* (su5pal*A*1) *which restores alkaline phosphatase activity in the* pal*A*1 *mutant is an allele of* palc*C*4, *a mutant with a simultaneous reduction in alkaline and acid phosphatase activity. These data suggest that the phosphatase proteins may be made up of two or more different polypeptide chains, and that some of the polypeptide chains are common to two or more of these enzymes.*

Electrophoretic and genetic studies indicate that the phosphatase system in *Aspergillus nidulans* has several features which distinguish it from the same system in *Escherichia coli.* Among these are (i) the large variety of phosphatase mutants and (ii) the large number of genetic loci affecting enzyme activity. Mutants have been isolated which affect either separately or together two or more of the four electrophoretically distinct phosphatases found in crude extracts of the wild type (*1*, *2*). Furthermore, one genetic suppressor (*su*B2*pal*B7) of a mutant lacking alkaline phosphatase (*pal*B7) restores alkaline phosphatase activity with a concomitant loss of an acid phosphatase component. Another suppressor (*su*A1*pal*B7) produces a partial restoration of alkaline phosphatase activity with an electrophoretic change in a different acid phosphatase component.

On the basis of these results I proposed a hypothesis that monomers interact in four distinct heteromultimeric proteins (*2*). This hypothesis would gain support if it could be shown that at least one alkaline phosphatase locus, one acid phosphatase locus, and one locus with no phosphatase at all control, indeed, the structure of the corresponding proteins. Furthermore, since it has been proposed that both a multiple loss mutant and a suppressor mutant may in some instances affect a common monomer, they should fall into the same cistron (*2*).

Histochemical techniques are available for demonstrating the presence of alkaline or acid phosphatase activity in colonies of *Aspergillus* (*2*). A number

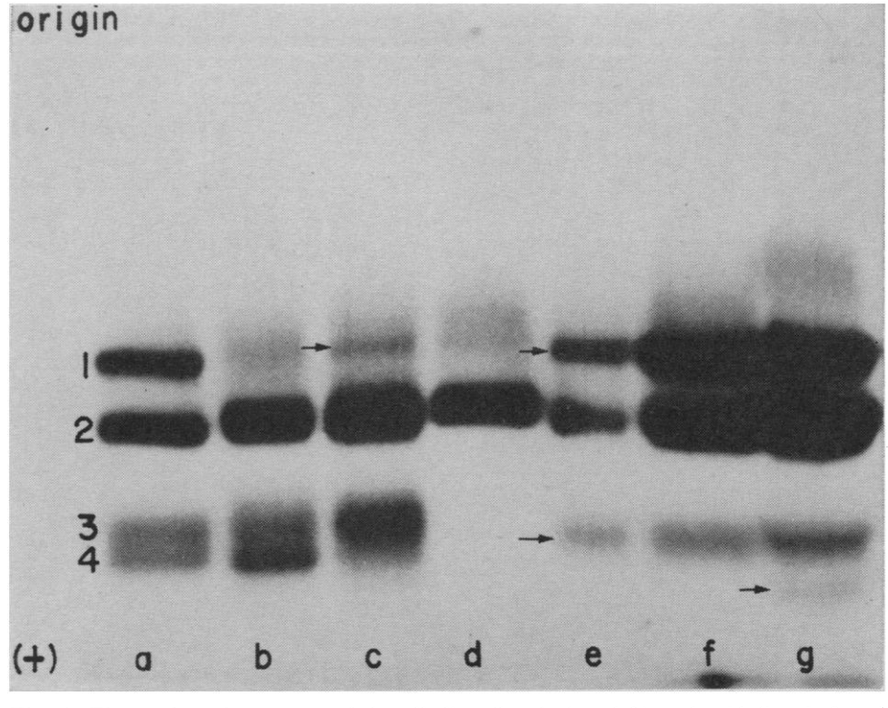

Fig. 1. Electrophoresis patterns of the alkaline (bands 1 and 2) and acid (bands 3 and 4) phosphatases in crude extracts of the wild type and several strains lacking phosphatase grown at 35° and 25°C; (*a*) wild type at 35° and 25°C; (*b*) *pal*B7 at 35°C; (*c*) *pal*B7 at 25°C; (*d*) *palc*A1 at 35°C; (*e*) *palc*A1 at 25°C; (*f*) *pac*C5 at 35°C; (*g*) *pac*C5 at 25°C. Arrows indicate temperature-sensitive phosphatases produced by the mutant strains. The gel was run at room temperature at a potential difference of 5 volt/cm.