on the amount of free tyrosine, while the theoretical value of nitrogen content is calculated from the iodine. Thus, since the theoretical values of both nitrogen and iodine checked very well with the analytical data, there is no doubt that the action of iodine on the protein is only on the tyrosine molecule.[13] In addition, it should be noted that the tryptophane content of the iodinated lactogenic hormone is not different from that of the parent substance. It is apparent, therefore, that any change found in the physiological activity of lactogenic hormone after treatment with iodine has been effected solely through modification of the tyrosine component of the hormone.

So far as we are aware, instances have not hitherto been detected of the dependence of physiological activity upon the presence of both free amino groups and tyrosine. Studies of pepsin and insulin show that tyrosine is an essential component of both these substances; yet free amino groups are not essential for their biological action. Lactogenic hormone would seem to be the first protein substance in which the essentiality of both tyrosine and free amino groups has been shown.

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[13] Kinetic data also support this conclusion. The kinetics of reactions between iodine, tyrosine and lactogenic hormone have been studied in some detail and will be reported later.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

MESOSTOMA EHRENBERGII WARDII FOR THE STUDY OF THE TURBELLARIAN TYPE

IN most laboratories of this country a species of Dugesia or some other common triclad is used in the laboratory as a Turbellarian type. The planarians have the advantages that they are large and are excellent material in which to demonstrate regeneration. However, they have many disadvantageous points which far outweigh the advantageous ones, it seems to me. They are thick, opaque; their reproductive organs are small and sometimes not present, and finally the other morphological features are difficult to distinguish.

Mesostoma ehrenbergii wardii, on the other hand, has the advantages of also being large; being thin, transparent; having proportionately large reproductive organs nearly continuously present; and lastly all morphological features are clearly visible in the living animal. The single disadvantage, *i.e.*, that *M. ehrenbergii wardii* has practically no powers of regeneration, is eliminated by simply collecting a few planarians for these experiments. This also enables one to emphasize the fact that two very closely related groups of animals have very different regenerative abilities.

In Fig. 1 I have attempted to show every feature that can be seen in the living animal with the use of very little technique and patience. A specimen of *M. ehrenbergii wardii* is placed in a small drop of water on a suitably sized coverglass. A second coverglass, which has been ringed with vaseline, is inverted over the drop and pressed down gently until it makes contact with the water. The pressure is then gradually increased until the animal is only able to move slowly. If it contains eggs, they will be caught between the coverglasses and the animal held comparatively quiet. The coverglasses may then be placed on a large slide under the dissecting or compound microscopes, and studied first under the lower powers and, after the animal has ceased struggling violently, under the 4 mm or oil immersion objectives. By inverting the coverglasses one may examine the dorsal or ventral surface of the body, a great advantage since many features are more easily seen from one side than the other. The magnificent flame cells, seen to best advantage in the region of 3 in the drawing, are probably the most striking thing present in these preparations, although in several very favorable specimens I have seen division figures in the testes.

A final exercise which is very simply done and gives good results is a demonstration of the chromosomes of this animal by means of an acetocarmine smear. The same specimen which has been studied during the period can be used for the smear. The animal is placed in a small drop of water on a slide, a drop of acetocarmine added and a coverglass placed over it. The animal is then mashed thoroughly by pressure on the coverglass with the blunt end of a needle holder. The excess liquid is taken off with absorbent paper, the slide warmed slightly and the coverglass ringed with paraffin or vaseline. The chromosomes are very large, up to 32 μ in length, and can be seen easily with high power. They are visible in the freshly prepared slide but are much more apparent after an interval of one or two hours.

M. ehrenbergii wardii is a member of the order Rhabdocoela, or forms with rod-shaped enteric cavities, and therefore belongs to an entirely different order of the Turbellaria from that of the planarians. It is, however, just as representative of the entire

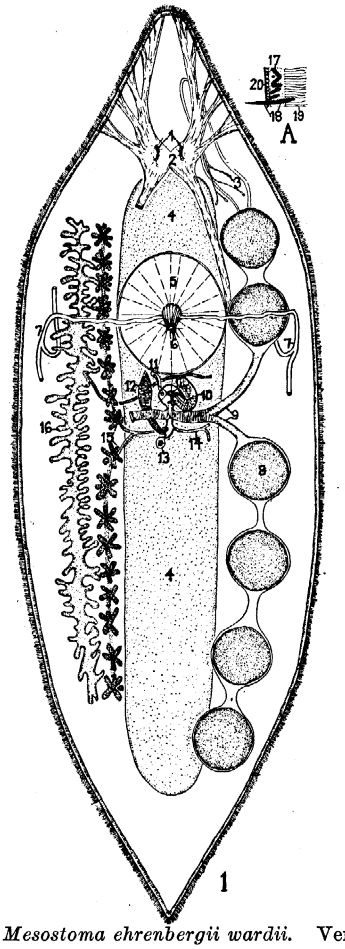

FIG. 1. *Mesostoma ehrenbergii wardii.* Ventral view. A. Enlarged section of body wall. 1, eyes, on dorsal surface of brain; 2, brain with nerves running anteriorly and posteriorly; 3, flame cells, distributed over the entire body, but usually most easily seen in this region; 4, rod-shaped enteron; 5, rosulate pharynx; 6, mouth on ventral surface of the body; 7, protonephridial tubule; 8, brown, thick shelled, biconvex winter egg—the summer eggs are thin shelled and semi-transparent; 9, branches of the uterus, shown only on left side of the animal; 10, male copulatory organ, usually most easily recognized by the sperm in its proximal chamber; 11, bursa copulatrix, very small and difficult to see; 12, ovary, most easily distinguished by the oöcytes with large nuclei which it contains; 13, receptaculum seminis, very large or very small according to the condition of the animal; 14, yolk or vitelloducts; 15, yolk glands or vitellaria, shown only on right side of body; 16, testes, shown only on right side of body; 17, rod-shaped rhabdites in epidermis; 18, dermal rhabdite; 19, cilia; 20, muscular layer of body wall.

class as are the triclads. The legend to the figure has been purposely made as complete as possible in order to facilitate the location of the structures shown.

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A STABLE THROMBOPLASTIN FOR USE IN QUICK'S PROTHROMBIN TEST[1]

QUICK'S method for the determination of active prothrombin in the blood is now widely used in the control of hypoprothrombinemia resulting from avitaminosis K or hepatic disease. Unfortunately, the thromboplastin used in the test is unstable and the preparation of fresh thromboplastic extract from rabbit brain is a laborious procedure.

A stable preparation of thromboplastin has been made which requires the addition of only distilled water before use. This preparation permits the test to be performed with greater ease than formerly.

The saline extract of fresh rabbit brain was prepared according to the technique of Quick *et al.*[2] Brains were removed from freshly-killed rabbits, stripped of superficial blood vessels, washed, comminuted to a paste and dried. The dried residue was extracted with 0.85 per cent. sodium chloride solution and the extract incubated at 56° C. for 15 minutes. One ml amounts of incubated extract were introduced into suitable vials and dried by the lyophile method of Flosdorf and Mudd.[3] Under such circumstances the dry material keeps at room temperature without loss of potency for at least ten weeks. When the contents of the vials are diluted to the original volume of 1 ml with distilled water, a thromboplastin solution equal in strength to one freshly prepared is obtained. This amount of thromboplastin solution is sufficient for nine determinations of "prothrombin time."

The convenience of having a stable source of thromboplastin on hand is apparent. Details of the application of this preparation and assays of its potency will be presented elsewhere.

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