TABLE II
EFFECT OF THYROIDECTOMY ON MALE RATS (3½ MOS. OLD) OPERATED ON AT THE AGE OF 1 MONTH

No. rats	Body wt. (gm)	Weight in mg				Maternal behavior
		Ant. Hyp.	2 Adr.	2 Thyr.	2 Testes	
20	215	13	36	.....	2,965	Yes
20*	290	6	37	41	2,989	No

* Controls.

for long periods on a pile of newborn rats in a can placed on a table; (4) picking up the newborn rats and licking them in a maternal way; (5) desire to doze and snuggle in corners or up against objects, if given the freedom of a large shelf in the laboratory; (6) tendency to huddle in small groups, at intervals licking each other affectionately, when allowed to roam at will on the floor.

In both groups, the pituitaries were considerably enlarged, compared with those of the male controls. No mammary development was observed in the thyroidectomized males.

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EGG QUANTITY AND THE RESPIRATORY RATES OF SEVERAL MARINE EGGS

IN previous publications[1] the rates of oxygen consumption by the eggs of *Fucus, Cumingia, Nereis, Chaetopterus* and *Arbacia* were expressed in mm^3O_2 per hour per 10 mm^3 eggs. The quantity of eggs was determined in volume units by centrifuging to approximate equilibrium packing of the eggs in calibrated vaccine tubes having diameters of the order of 2 mm. As the eggs distort to pack tightly under strong centrifugal force, the measured volumes were regarded as only slightly too great, due to interstitial space among the eggs. The centrifugal force used was not reported.

More recently, in the case of *Arbacia,* Gerard and Rubinstein[2] have compared volume determination by centrifuging, and by haemocytometer counts and dilution counts with measurements of egg size. They have found centrifuge determinations to average 80 per cent. or more too great. This was with relatively low centrifugal force, 400–750 × gravity. Shapiro[3] has compared the equilibrium centrifuge volume of *Arbacia* eggs at various centrifugal forces with the volume determined by haemocytometer and dilution counts. He finds that at 2700 × g centrifuge volumes agree with determinations by haemocytometer counts to within an average of approximately ± 10 per cent. Fifteen determinations showed an average greater volume by centrifuging of 12 per cent., while fourteen showed an average lesser volume of 7.7 per cent.

Since the magnitude of the error of volume determination by centrifuging depends on the centrifugal force (being greater at low force), the particular centrifugal forces used in deriving the respiratory rates referred to above should be reported. When conversion factors have been established for the several eggs the rates may then be converted to absolute volume units. Late in the summer of 1934, with the kind assistance of Dr. Samuel Pond, the same (unaltered) centrifuge previously used at the Marine Biological Laboratory for the eggs referred to (except *Fucus*) was accurately calibrated under conditions previously used. The centrifugal force was 2850 × g, or if an allowance of 10 per cent. speed retardation during calibration is made, it may have been as high as 3400 × g. The duration of the original centrifuging in the cases of *Cumingia, Nereis* and *Chaetopterus* was 15 minutes. *Arbacia* eggs were centrifuged in some cases 15, in some 10 and in some 18 minutes. *Fucus* eggs were centrifuged 15 minutes or longer at lower centrifugal force, probably of the order of 1500 × g.

This does not affect relative rates previously given for the same eggs measured before and after fertilization. Comparisons[4] of absolute rates of different species of eggs (or of the same species when volumes are measured by different methods) are untenable,[2] except upon the assumption that the errors of volume determination are small (or are similar[5]).

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

STROBOSCOPIC OBSERVATION OF CILIARY MOVEMENT IN THE PROTOZOA

STROBOSCOPIC observation is carried out by means of light interrupted into consecutive flashes of known frequency and duration. In the study of normally beating cilia under a microscope supplied with stroboscopic light it is possible by varying the flash frequency to obtain the effect of slowing the cilia to any

1 *Jour. Gen. Physiol.,* 15: 167–200, 1931; and 16: 475, 1933.
2 *Ibid.,* 17: 375, 1934.
3 *Biol. Bull.,* in press.
4 *Jour. Gen. Physiol.,* 16: 497, 1933.
5 J. Runnström, *Protoplasma,* 20: 1, 1933.