classes of spermatozoa are associated with more profound differences in the sperm and that it is these differences rather than the difference in quantity alone that have a determinative influence in sex determination. An examination of almost 10,000 male and female eggs of *P. caryœcaulis* shows that the male eggs occur about five times as often as the female eggs. A study of the output of each stem-mother shows that in some cases all of her progeny are males, in other cases all females, and in most cases both males and females with a preponderance of males. The results are obviously not connected with chance combinations of chromosomes, but definite "tendencies" exist in certain individuals that follow one or the other alternative. These tendencies might seem to be the result of external factors, but nothing was discovered in the history of the individuals that favors such an interpretation; although the possibility of such an effect must be granted. The author's general conclusion is summed up in the statement that the quantitative interpretation of sex-determination is only the first rude approximation to a solution. The facts suggest that the visible quantitative differences are associated with more profound changes and the facts described for the phylloxeran egg give some indication of the nature of those changes; for, the sex chromosomes seem rather to follow sex than to be its sole cause.

"Factors of Form Regulation in *Harenactis attenuata*, III., Regulation in Rings," by C. M. Child. Under certain conditions short cylindrical pieces from the body of the actinian, *Harenactis attenuata* form "rings" by the union of oral and aboral ends. Such rings may give rise to one or several more or less radially symmetrical groups of tentacles in the region of union.

THE FIRST CRUISE OF THE "CARNEGIE" AND HER EQUIPMENT[1]

THE *Carnegie*, engaged in a magnetic survey of the oceans under the direction of the department of terrestrial magnetism of the Carnegie Institution of Washington, entered on her first cruise August 21 last. As may be recalled, this is the first vessel in which the attempt has been made to exclude practically all materials affecting the compass needle. Hence the magnetic data secured on her can be made immediately available, it being now unnecessary to await the determination of troublesome and more or less uncertain deviation corrections.

The tests made at Gardiner's Bay, Long Island, August 21 to September 2, and at Falmouth, England, have demonstrated conclusively that no correction of whatever kind need be applied to the *Carnegie* results. The following table will show the close agreement in the values of the three magnetic elements obtained on the various headings during the swings at Gardiner's Bay:

Ship's Head	Magnetic Declination (Variation of the Compass)	Magnetic Dip.	Horizontal Magnetic Intensity (C.G.S. Units)
N.	11°25′ W.	72°01′	.1825
NE.	26	07	23
E.	28	07	25
SE.	22	07	25
S.	22	05	27
SW.	19	02	25
W.	21	05	22
NW.	27	11	23
Mean	11 24	72 06	.1825

Nothing could be more satisfactory than this exhibit of the fulfillment of the requirements as to non-magnetic conditions at the places where the instruments are mounted.

The observations made on the trip from New London, Conn., to St. Johns, Newfoundland, and from there to Falmouth, England, during the severe October gales afforded ample opportunity for trying out the observational appliances, and these stood the tests put upon them, during the exceptionally adverse conditions, even beyond expectations. A large part of the instrumental equipment was especially designed and constructed in the workshop of the Department of Terrestrial Magnetism.

In brief, it may be confidently asserted that

[1] Abstract of paper presented before the Philosophical Society of Washington, November 20, 1909, by Dr. L. A. Bauer, of the Carnegie Institution of Washington.

ocean magnetic work is now on a stage of perfection not hitherto reached, permitting obtaining useful data not only expeditiously but also with all necessary accuracy both as regards practical and scientific demands.

The introduction of circular observatories in which the magnetic instruments are mounted has proved of great advantage. The domes being revolvable, it is possible to direct an open panel to any part of the skies, thus permitting astronomical and magnetic observations being made with full protection to the observer and the instrument from wind and weather. Hitherto all such observations have had to be made on an open bridge.

Another important feature of the research work on this unique vessel is the developing and perfecting of a producer gas engine for auxiliary marine propulsion. The *Carnegie* has a non-magnetic plant of this kind of 150 horse power, sufficient to drive her at six knots in calm weather, or at about 144 knots per day at a total cost for coal consumed during the day of but seven dollars. Such difficulties as have been encountered thus far are mainly due to the non-magnetic metals which have had to be so largely employed. However, these difficulties are being successfully solved one by one. As a matter of fact, the *Carnegie* has entered and left every port thus far, under bare poles, with the aid of her auxiliary power and so likewise the vessel was swung during the trial tests at Gardiner's Bay and Falmouth, using only the auxiliary power. This vessel is the first sea-going one having such a plant.

The next table gives the results of the magnetic observations up to Falmouth.

The last three columns show the average errors of the best magnetic charts at present available. Glancing over them the following conclusions may be drawn:

1. From Long Island to some point off Newfoundland the charts used by mariners show too small westerly magnetic declinations (variations of the compass) by about one degree in the maximum, thereafter and continuing to England, the error changes sign, indicating that the charts give too large west magnetic declination, the maximum error being nearly one degree. Were there not such a systematic run in the errors they would not be of great importance to navigation, but as the sign is the same for great distances the general effect would be, in the present instance,

Magnetic Results obtained on the "Carnegie," September–October 18, 1909, in the Atlantic Ocean

No.	Latitude N	Longitude W. of Greenwich	Date 1909	Declination West	Dip. N.	Hor. Int. C.G.S. Units	Corrections of Charts		
							Declinations	Dip	Hor. Int. C.G.S. Units
1	41.1°	72.2°	Sep. 1	11.4°	72.1°	.183	+0.4°	+0.2	—.002
2	41 0	71.1	13	12.3	72.0	.182	+0.4	+0.1	—.003
3	40.9	70.4	14	12.9	.....	.....	+0.8	.....	.....
4	40.7	69.4	14	12.8	71.7	.185	+0.3	—0.1	.000
5	40.7	68.9	15	13.9	71.9	.182	+0.6	+0.2	—.003
6	40.9	68.4	16	14.4	.....	.....	+0.6	.....	.....
7	41.3	66.4	17	16.2	71.9	.181	+0.6	0.0	.000
8	42.0	61.1	20	20.2	.....	.177	+0.9	.....	000
9	42.5	61.2	21	20.8	.....	.176	+0.9	.....	+.003
10	42.8	60.8	21	21.4	72.5	.173	+1.1	+0.5	.000
11	43.8	58.9	22	23.7	72.7	.171	+1.1	+0.6	+.004
12	45.5	55.7	23	.....	72.7	.169	.....	+0.4	+.010
13	47.3	52.6	25	.....	73.5	.158	.....	+0.2	+.006
14	47.6	52.7	28	29.75	73.5	.159	0.0	—0.1	+.008
15	47.8	51.4	Oct. 3	30.4	.....	.....	0.0	.....	.....
16	48.2	50.4	3	.....	73.5	.157	.....	—0.2	+.008
17	48.4	48.0	4	31.8	.....	.....	+0.3	.....	.....
18	48.5	47.7	4	31.8	73.0	.161	+0.1	—0.1	+.011
19	48.7	46.5	5	31.8	.....	.....	—0.2	.....	.....
20	48.9	45.5	5	32.1	72.5	.161	—0.2	—0.2	+.010
21	49.6	37.5	7	.....	71.2	.168	.....	0.0	+.014
22	50.3	32.1	8	30.2	70.7	.171	—0.4	—0.3	+.014
23	50.6	28.8	9	29.0	.....	.....	—0.8	.....	.....
24	50.6	24.0	10	26.6	.....	.....	—0.8	.....	.....
25	50.6	22.2	10	.....	69.2	.174	.....	—0.3	+.008
26	50.5	19.2	11	24.5	.....	.....	—0.2	.....	.....
27	50.3	17.2	11	22.9	68.3	.180	—0.8	+0.1	+.006
28	49.9	11.9	12	20.3	67.4	.185	—0.6	+0.4	+.006
29	49.6	9.3	13	19.7	.....	.....	+0.2	.....	.....
30	49.5	7.5	13	18.6	66.3	.189	—0.1	+0.2	+.001
31	50.0	5.0	14	17.5	.....	.....	0.0	.....	.....
32	50.1	5.0	18	17.8	66.5	.187	+0.2	+0.2	—.002

No. 1 at Gardiner's Bay; No. 14 at St. Johns, N. F.; No. 32 in Falmouth Bay, England.

to set the course of a vessel (when reliance must be put solely upon the compass and the log) always towards Newfoundland, whether the vessel came from the east or the west.

2. The chart errors in dip may amount to one half degree.

3. The chart values of the horizontal intensity are in general too low, the error amounting at times to nearly one tenth part.

4. A part of the errors found in the three magnetic elements are due to secular variation.