Zuckerkandl based his conclusions that children have more elongated heads than adults on measurements of 156 children and 197 adults from the interior parts of Austria. But in selecting these individuals he excluded what he calls the Slavic type, including only the elongated heads which he ascribes to the Teutonic type. This arbitrary selection makes the results of his comparison of doubtful value for a treatment of the question of growth; Zuckerkandl discusses this point at length and points out that his statistics must not be considered final. (*Mitt. der Anthrop. Ges. in Wien* XIV. 1884, p. 127.)

Holl has based his statement on the measurement of only 16 skulls of children, and consequently no weight can be attached to it.

Mies to whom Dr. Ripley refers does not make—so far as I can make out—any statement in regard to the question at issue in the passage quoted (ibid. XX. 1890, p. 39 ff.).

The statistics of Dr. Livi which were published in the *Archivio per l'antropologia e la etnologia*, 1886, p. 235, are based on observations by Calori, Brennsohn, Waldhauer, Wæber and Broca; but they are classified in two groups: of more and of less than 33 years of age, and can therefore not be utilized for treating the question of the influence of growth upon the form of the head, as they are rather directed to detecting retrogressive changes which begin after the 35th year of life.

While these European data are open to serious objections, we find in America that with few exceptions long-headed tribes as well as short-headed ones, show a decrease in the value of the cephalic index with increasing age. I have compiled the following table in order to make this point clear:

CEPHALIC INDEX OF

Tribe.	Adults.	Children.	Difference.
Micmac.....	79.0 (136)	80.9 (84)	+ 1.9
Eastern Ojibwa...	81.8 (396)	81.6 (309)	— 0.2
Cherokee...	82.0 (140)	81.0 (75)	— 1.0
British Columbia...	83.6 (284)	85.3 (138)	+ 1.7
Moqui	84.0 (116)	86.4 (77)	+ 2.4
Navajo.....	84.2 (77)	86.8 (76)	+ 2.6

The cause for this decrease is not far to seek. With maturity the frontal sinuses and the occipital protuberance begin to grow, particularly in males, while there is no corresponding local growth on the parietal or temporal bones. This has the effect that the length grows more rapidly than the breadth and that the index begins to decrease. The lesser development of the frontal sinuses and of the occipital protuberance in women is also a sufficient explanation for their greater brachycephalism.

Nevertheless, I believe that the breadth of the head increases as long as the length, although at a slower rate, and that Dr. Ripley would have obtained this result if his series had been more extensive. I cannot find that Schaafhausen, who held this opinion, has substantiated it by any extensive series of observations. The best series that is available is that of Dr. Venn (*Jour. Anthrop. Institute.* XVIII., p. 152, ff.) which when arranged from this point of view gives the following results:

Year.	Length of Head. Inches.	Breadth of Head. Inches.	Index.	Individuals.
19	7.54	5.87	77.9	139
20	7.57	5.93	78.3	305
21	7.58	5.93	78.2	248
22	7.63	5.98	78.4	189
23	7.54	5.97	79.2	83
24	7.71	6.03	78.2	52
+25	7.62	6.00	78.7	79

But the growth of the head does not close with the twenty-fifth year. The following table shows that among the Indians it continues to grow until near the thirtieth year, and the period will certainly not be found shorter among people of European descent, while it may be shorter among the negroes:

Years.	Length of Head.
20–21	193.0 mm.
22–23	193.7 "
24–25	193.8 "
26–27	194.3 "
28–29	194.8 "
30 and more	194.8 "

FRANZ BOAS.
NEW YORK.

BIOLOGY, ZOOLOGY AND BOTANY.

TO THE EDITOR OF SCIENCE: Prof. Conway MacMillan, who claims (SCIENCE, III., p. 634) to have single-handed banished a 'sham

biology' from two of our leading universities, still has work to do. As Prof. Brooks tells us (SCIENCE III., p. 708), the Johns Hopkins University had not in the twenty years of its history examined a candidate for the doctorate in 'biology.' Yet this year, perhaps as a declaration of independence from the influence of Prof. MacMillan, it has conferred the degree of Doctor of Philosophy on a candidate who chose 'biology' as one of his subjects.

Questions of nomenclature seem to be more interesting to the botanist than to the zoologist, and it is not the present writer's intention to discuss this one. But the occasion seems favorable for asking Prof. MacMillan why it is that zoology has become to such a large extent synonymous with biology. Is it not, perhaps, because the zoologist is usually a biologist, whereas the botanist is usually only a botanist? The great advances which, during the past forty years, have transformed biology, have come almost exclusively from the side of the zoological sciences. Zoologists have not hesitated to use botany when they could, but in the advancement of biology, botany, even as a silent partner, does not seem to have contributed its share of capital. Y.

AN UNCOMMON AFTER-IMAGE.

SOME days since, while traveling by boat, I awoke in the early morning, and, thrusting my head out of the window, was almost overpowered by the yellow glare. I then raised the blind with its yellow horizontal slats, and for a moment noticed the glare pouring through them. Then, shutting my eyes, I had for a few seconds an after-image of some half-dozen *vertical* green lines gradually fading away into *vertical* violet lines.

HIRAM M. STANLEY.

MACKINAC ISLAND, June 20.

THE NINE-BANDED ARMADILLO.

TO THE EDITOR OF SCIENCE: In his recent paper, in the *Bulletin of the American Museum of Natural History*, on mammals collected in Bexar County and vicinity, Texas, Prof. Allen refers to the capture of specimens of the nine-banded armadillo at several places north and west of Bexar County, but mentions none from that county. It may be of interest, therefore, to note that five specimens were taken in the county in May, 1895, about four miles from San Antonio. There were two adults and three young, all captured immediately after a heavy rain which had driven them from their burrow. This family of armadillos was presented by Mr. F. Hardman, of San Antonio, to the National Zoological Park in this city, where two of its members may still be seen, apparently in excellent health.

A. B. BAKER.

WASHINGTON, D. C., June 22, 1896.

ROCHEFORT ON THE CARIBBEANS.

TO THE EDITOR OF SCIENCE: Appropos of the wonderful explorations of Mr. Frank Hamilton Cushing and his party in San Marco, Florida, last winter, under the auspices of the University of Pennsylvania, I would call attention to the following sentence in Rochefort (Caribby Islands, London, 1666, p. 291). Speaking of the Caribbeans he says: "Their Habitations are somewhat near one to another, and disposed at certain distances after the manner of a Village; and for the most part they plant themselves upon some little ascent, that so they may have better air and secure themselves against those pestilent flies which we have elsewhere called *Mosquitos* and *Maringoins*, which are extreamly troublesome, and whereof the stinging is dangerous in those parts where there is but little wind stirring. The same reason it is that obliges the *Floridians*, beyond the bay of *Carlos* and *Tortugues*, to lodge themselves for the most part at the entrance of the Sea in Huts built on Piles or Pillars."

O. T. MASON.

U. S. NATIONAL MUSEUM, July 2, 1896.

SCIENTIFIC LITERATURE.

Handbuch der paläarktischen Gross-Schmetterlinge für Forscher und Sammler. Zweite gänzlich umgearbeitete und durch Studien zur Descendenztheorie erweitete Auflage, etc. VON DR. MAX STANDFUSS, mit 8 lithographischen Tafeln und 8 Textfiguren. Jena, Gustav Fischer, 1896. 8°. Pp. 392.

This is much more than an ordinary handbook for the lepidopterist, since it comprises a