

—The favorable reception accorded in the past to the Easter-card packets put up by H. H. Carter & Co., Boston, has encouraged this enterprising house to prepare their 1889 packages with even greater care than heretofore. Being one of the largest dealers in this class of goods in the country, and selling paper directly from the mills, they are enabled to give exceptionally good values. People dealing with them are sure to find their goods satisfactory.

—Contortionists and "Snake-men" will be described in the April *Scribner* by Dr. Thomas Dwight of the Harvard Medical School, who has made a thorough investigation of their peculiar anatomy. Photographs of several expert contortionists in their most wonderful feats will be reproduced in the article. Henrik Ibsen, the Norwegian dramatist, a literary genius little known in this country, is the subject of a paper in the same number. Charles Francis Adams's paper on "The Prevention of Railway Strikes" was written nearly three years ago, but held back by the author for fear that, in existing conditions, it might result in more harm than good. A practical scheme for giving employees a part in the management of the road is suggested. Pictures showing stages in the building of the great ocean steamers, the "City of New York" and others, will illustrate Mr. Rideing's article on "Ocean Greyhounds."

—At a regular meeting of the Nineteenth Century Club, New York, on the 9th of November last, a resolution was passed appointing a committee to prepare and publish a memorial volume to the founder and first president of the club, and to solicit subscriptions to defray the expenses. This volume is now ready for publication. The book will contain the funeral orations, the addresses delivered at the memorial meetings, and essays and letters since received. It will consist of about two hundred pages, octavo, printed on heavy Holland paper, and richly bound in levant morocco. This edition, upon which no pains or expense will be spared to make it worthy of the club and of the occasion, will cost five dollars per copy. For those who desire it, an edition, handsomely bound in cloth, will be supplied at a cost of three dollars per copy. As frontispiece there will be a portrait of Courtlandt Palmer. As the committee have decided to print only such copies of the memorial volume as are ordered in advance, it is desirable that no time should be lost in notifying John H. Beach, 25 East 57th Street, of the number of copies and the kind of binding which may be desired.

—Mr. Andrew Lang is a frequent contributor of leading articles on social and literary topics to the *London Daily News*; and some of his admirers think that not a little of his most characteristic writing is to be found in these "leaders," as the English call them. One of these admirers, with the author's permission, has gathered some thirty of these essaylets in a volume which Longmans, Green, & Co. will publish shortly, under the apt title of "Lost Leaders." Among the subjects treated are "Thackeray's Drawings," the "Art of Dining," "Phiz," "Amateur Authors," and the "Lending of Books."

—James W. Queen & Co., 924 Chestnut Street, Philadelphia, announce a clearance sale of microscopes, objectives, accessories, and sundries, and have issued a new catalogue. The firm's stock-taking strongly calls attention to the fact that some microscopical accessories (and other goods) have not shown, of late, such activity of commercial movement as is desirable. They have therefore picked them out, described them in their special catalogue, and cut the prices, to make them move along. The articles described in this list are new and perfect unless otherwise noted.

—The following are from the table of contents of the April number of *The Chautauquan*: "Gossip about Greece," by J. P. Mahaffy, M.A., of Dublin University; "Agesilaus," by Thomas D. Seymour, M.A., of Yale University; "Greek Art," by Clarence Cook; "Color in the Animal World," by the Rev. J. G. Wood; "What Inventors have done for Farming," by James K. Reeve; "The Care of the Insane," by A. G. Warner, Ph.D.; "Sunday Labor," by the Rev. Jesse H. Jones; "The First Presidential Inauguration," by Charles Carleton Coffin; "English Pronunciation," by Robert McLean Cumnock, of Northwestern University; "Stu-

dent Life in Paris," by F. M. Warren; "British Columbia," by Sheldon Jackson, D.D., United States general agent of education in Alaska; "Women's Clubs in London," by Susan Hayes Ward; "A Virginia Plantation," by C. W. Coleman; "The Secret Service of the Treasury Department," by Mrs. Carl Barus.

LETTERS TO THE EDITOR.

* * *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.
The editor will be glad to publish any queries consonant with the character of the journal.

Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

Origin of Fish in Isolated Waters.

A FEW months ago I called attention to the abundance of fish in certain isolated ponds in Florida, which become dry at times. (*Science*, xii. p. 280). Mr. Henry W. Howe of Boston suggested in reply that fish may be transported from one pond to another by birds. This is an interesting suggestion, as indicating a possible explanation, though I am not aware that there is any evidence to that effect at present. Alligators might also be mentioned as a possible transporting agency. But any such means would seem to be inadequate to produce the observed results. Since my former communication, I have had further opportunity to investigate this subject. The past season in Florida has been a very unusual one. The rainy season, which usually begins in the peninsular portion of the State, about the 1st of June, failed to make its appearance, and a severe drought resulted. Ponds, swamps, creeks, and wells became dry. Then in the fall, when the rainy season usually closes, "the windows of heaven were opened," and a very wet fall and winter followed. But the ponds, which were dry for many weeks during the hottest part of the year, now swarm with little fish; and during the heavy rains fish could be seen not only in ponds, but in ditches beside the railroad, in ditches beside the fields, and in shallow rain pools which would dry in a few days, and had no connection with other waters. In fact, minnows have been almost abundant enough to give color to the old notion of the *rainings-down* of fish, frogs, tom-cats, lean meat, etc., reports of which are occasionally seen in the newspapers. There is certainly some certain and rapid means of populating the waters of isolated and temporary pools, which is well worth investigating.

CHS. B. PALMER.

Orange Heights, Fla., March 11.

The Soaring of Birds.

I HOPE I may be allowed space for a few short comments on Messrs. Gilbert and Kimball's letters in *Science*, xiii. pp. 169 and 170.

My conception of relative velocity does not differ from Mr. Gilbert's, as he supposes, and accordingly the statements of his paper were as clear to me as the restatements of his letter. So far as his presentation of the differential motion theory of soaring is concerned, my only criticism was that his assumption as to the dynamical effect of the wind on the bird during the turn seemed to demand more than mere assertion. One of my statements as to what this assumption implied, Mr. Gilbert questions as follows: "I do not admit 'that during the turn his [the bird's] velocity relative to the earth will change by an amount equal to twice the velocity, relative to the earth, of the medium in which the turn is made.' His velocity relative to the earth will change by an amount equal to twice his velocity relative to the medium." Both positions are correct, however. We are merely using the term "velocity" in different senses,—Mr. Gilbert as connoting both rate and direction of motion, I as connoting rate of motion simply. I used the term in this sense, because it was the sense in which Mr. Gilbert had used it when he asserted that the velocity of the bird relative to the air would be the same after a turn as before.

Both Mr. Gilbert and Dr. Kimball hold that the velocity of wind or bird relative to the earth "has nothing to do with the question." That surely depends, however, upon what the question is. If we undertake, as I did, to account for the fact that some birds are able, without flapping of wings, to describe paths which, *relatively to the earth*, are spirals about lines inclined upwards, velocities relative to the earth must be taken into consideration. If, how-

ever, the question is the somewhat simpler one of determining the conditions under which a bird can gain elevation without expending energy, velocities relative to the earth may, of course, be ignored.

There is, as I now see, a great advantage in making the simpler investigation first: for, as Dr. Kimball has clearly shown, as soon as we recognize the fact that the bird's motion relative to the medium depends only on their relative velocity, it becomes clear that gain of elevation, and consequently the whole phenomenon of soaring, is impossible in a uniform horizontal wind.

It follows that there was an error in my theory of soaring. Mr. Gilbert thinks it due in part to my assuming it to be possible for a bird to glide in a wind moving faster than itself, with its head to leeward; but I see no reason why birds should not accomplish this fact, and am satisfied that I have often seen them do it. He also holds that my bird, "in passing from a negative velocity relative to the air, to a positive velocity relative to the air, must pass through the phase of no velocity relative to the air, in which he is practically helpless." But I was dealing with the bird's component velocity in the line of the wind's motion; and he might always have a velocity relative to the air, though its component in that line might be zero. The error which I made was in assuming, that, under the conditions of flight to which I subjected my bird, the turn to leeward was possible. From the way in which I made him fly, it is clear that the resultant force exerted on him, at every point of his supposed path, must be upward and to leeward. That being the case, the turn to leeward could not be accomplished, and consequently the path he was supposed to describe was an impossible path.

I feel that I must apologize to those of your readers who may have followed me in what may fitly be called "a wild-geese chase."

J. G. MACGREGOR.

Dalhousie College, Halifax, N.S., March 8.

"Shall We Teach Geology?"

IN Professor Winchell's remarks on my review of his recent work, there are only two points that call for reply. First, as to the study of history, which, according to him, trains no faculty but verbal memory. He now says that his "criticisms on history contemplate it as a study urged upon children in the early stages of education," and that in the colleges it is pursued in a better way. But, even if imperfectly taught, history trains far more important faculties than verbal memory. It exercises the intellect generally quite as much as geology does, and it also calls into play the moral judgment and the sympathies, which geology does not. To Professor Winchell the old red sandstone may be a more important topic of study than the Roman Empire, and the plesiosaurus a more interesting object of contemplation than Washington or Columbus; but to the mass of men this is not so. As to the time that Professor Winchell would have spent on geology, I may have misapprehended his meaning; and, if so, I am glad to be corrected. I haven't his book by me at present; but, if I remember rightly, he says that the study ought to be taken up in the primary schools, and *continued through the various grades*, which I understood to mean that the subject should be studied more or less every year. He now says that he only wants it taken up several times at intervals, and not pursued continuously, which is more moderate. I do not see, however, how even so much study of geology is possible; because, not to speak of languages and literature, there are many sciences of greater importance than geology, which ought, therefore, to be studied first. Such are arithmetic and geometry, geography, physics, human physiology, psychology, ethics, civil polity, and history; and I do not see how even all of these can be taught in the public schools. If these views are correct, geology can be nothing but an optional study in the high schools and colleges, while in the lower schools it can have no proper place.

THE REVIEWER.

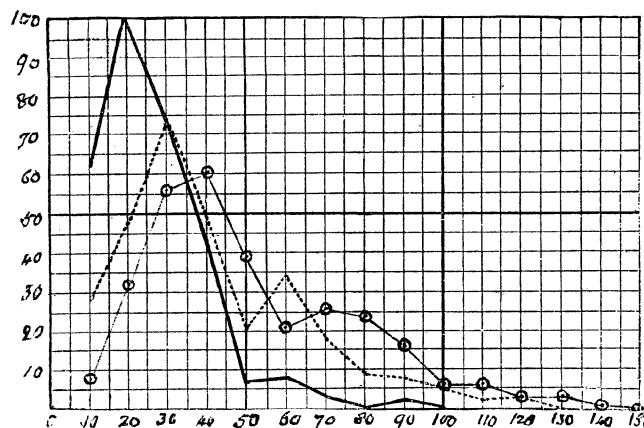
Curves of Literary Style.

IN the interesting researches on this subject by Professor Mendenhall described in your journal in 1887, words were classified according to the number of letters in them, and curves made ac-

cordingly. As he pointed out, there are many ways in which the principle of his method may be applied; and I have lately thought some instructive results might be obtained from examining sentences with regard to length, as measured by the number of words.

Length of sentences is a matter in which pronounced styles differ greatly. Doubtless this is associated with psychological peculiarities which it might be instructive to inquire into. The mental machine (so to speak) which, for example, turns out the long parenthetical sentences of Gladstone, must be very different in design from that which yields the simple and direct utterances of John Bright.

I have made an examination of 300 sentences in each of the following works: Carlyle's "French Revolution," De Quincey's "Confessions," and Johnson's "Rambler." The number of words in each sentence was counted, and the sentences grouped accordingly. Then the sentences with words up to 10 were added together, those with words from 10 to 20, from 20 to 30, and so on. The accompanying curves were then obtained from these data. Let it be clearly understood what they mean. The plain line curve (for Carlyle) means that in the 300 sentences of the passage selected there were 62 containing words varying in number up to 10, while 100 had from 10 to 20, and so on. The result is roughly as we might expect: short sentences form the bulk of the Carlyle passage, his maximum being in the class 10 to 20, and sentences of more than 50 words are comparatively few. There are none beyond 100. De Quincey and Johnson, on the other



CURVES OF LITERARY STYLE FROM CARLYLE, DE QUINCEY, AND JOHNSON.

Carlyle, heavy line; De Quincey, broken line; Johnson, light line with dots.

hand, have an abundance of longer sentences. De Quincey's most numerous class is that of 20 to 30 words; Johnson's, 30 to 40. But the curve of the former does not die down till after 110 to 120 words (really there was one inordinate sentence of 170, not shown in the diagram); while Johnson's is further protracted to 130 to 140.

I do not affirm the constancy of these curves: they only apply to the specified passages of 300 sentences. These few lines are merely by way of suggestion, and should any reader have the time and patience to pursue the inquiry further, he might, I think, find his labors not without some useful results.

It might be useful to see in what degree these curves approximate to constancy, or come short of it. One would like to know better than we do at present, how far the method, in any of its forms, is reliable or helpful in settling disputed questions of authorship, or in tracing anonymous literature to its source.

I would suggest an examination of the words used by speakers or writers as likely to be instructive.

A. B. M.

London, March 7.

Wind-Velocity and Wind-Pressure.

FROM time to time there have appeared discussions of these questions, so important to the practical engineer. It seems probable that the first of these, as far as relates to the relation between wind-movement and the travel of the cups of Robinson's anemometer, is soon to be definitely settled by indubitable experiments.