— The poem by Oliver Wendell Holmes, in honor of the dinner given to James Russell Lowell on his seventieth birthday, is the first thing to which the readers of the April *Atlantic* will turn. Mr. H. C. Merwin contributes a paper on "The People in Government;" and Mr. Samuel Sheldon answers the question "Why our Science Students go to Germany." Thomas Basin, Bishop of Lisieux, who suffered much at the hands of Louis XI., forms the subject of an article by Mr. F. C. Lowell; and William Cranston Lawton writes entertainingly of an archæological journey "From Venice to Assos." Miss Preston continues her series of articles by a paper entitled "Before the Assassination," giving an account of Cicero's closing years; and Miss Louise Imogen Guiney, under the name of "An Outline Portrait," writes a pleasant sketch about Lady Magdalene Herbert, mother to George Herbert. Mr. Hardy's serial, "Passe Rose," is concluded; Mr. James's "Tragic Muse" is continued, and the concluding portion of "Hannah Calline's Jim" also forms part of this number. The two short stories are "The King's Cup and Cake," by Sophie May, and "A Dissolving View of Carrick Meagher," by George H. Jessop. Mr. Bliss Carman, the young Canadian poet, contributes a long poem, "Death in April;" and Dr. T. W. Parsons, some verses called "In Eclipse." Criticisms of Renan's dramas and other recent books conclude the number.

— Sir Charles Dilke, in an article on "The Future of Russia," in the *Fortnightly Review* for March, says, "Not only is Russia the greatest military power in the world, but she is the European power with the largest homogeneous population and the greatest expansive force. Territorially she has the largest empire, possessing a vast share of the Old World; and hers is a people full of patriotic and religious spirit, and so well disciplined that all except an infinitesimal minority obey cheerfully and without question, under all circumstances, whether good or evil, the will of a single man. Yet, although subject to what, with our parliamentary ideas, we are disposed to style 'despotism,' the Russian people are full of spirit, and of those qualities which we consider specially Anglo-Saxon, — 'pluck' and 'go.' Russia has absorbed with rapidity, but with completeness, the greater part of central Asia, has drawn steadily nearer and nearer to our frontier, and has made herself extremely popular with the people she has conquered. Her policy throughout the century has been apparently fixed in object, but pursued with patience; and while there seems to be no reason to suppose any probability of a speedy collision, which England will do nothing to provoke, it is impossible for those who are charged with the defence of India to shut their eyes to the possibilities or even the probabilities of the future."

— The February number of the *American Journal of Psychology* opens with an interesting autobiography of a paranoiac, edited and commented upon by Dr. Frederick Peterson. The writer of the four-hundred-page manuscript book from which Dr. Peterson abstracts was a farm laborer, with a turn for study (he read Latin *con amore*) that helped to give him a remarkably direct literary style. The paper is interesting psychologically for the inside view it gives of the gradual development of his mental disease. Beginning life with hereditary predisposition, he grew up a hypersensitive and self-conscious child, a depressed and occasionally violent young man, suspicious of insult and persecution, contemplating murder in revenge, and finally reached the hallucinations and delusions of a typical paranoiac. His delusions of grandeur were colored by his reading of the Bible. First he found coincidences with his own experience. By degrees he recognized these less and less as coincidences, and regarded them more and more as prophetic, till at last he was ready to announce himself as the expounder of a new religion. His sufferings were the world's expiation, whence the title of his book, "The Piling of Tophet and the Trespass Offering." Though unable to correct his aberrations, he was a keen observer of his own mind, coherent, logical, and, like many of his class, not without at times a shadowy recognition of his true condition. The other two papers are continuations from the last number. Dr. W. H. Burnham brings down his survey of the doctrine of memory from Zanotti and his fantastic explanation of the association of ideas by their "electricity and magnetism," to Hering and Creighton. The theories held by the disciples of Hartley, by Kant and his followers, by the Scottish school, by the English associationists, by the exponents of the "new psychology," are all considered; and finally, the modern theory of "organic memory," the beginnings of which, it appears, are to be found in Malebranche. Dr. E. C. Sanford discusses the variations produced in the amount of the personal equation by the kind of the heavenly body observed, by the magnitude of the star, by its rate and apparent direction of motion. and by the psychic and other conditions of observation. The reality of these changes seems demonstrable, and the law of their cause is not always clear. They furnish rather suggestive points for physiological and psychological research, than generalizations that can be taken ready-made into either science. This number contains the usual abundance of reviews and notes on psychological literature; "Nervous System," by Dr. H. H. Donaldson; "Hypnotism, Experimental and Abnormal," by Professor Joseph Jastrow. Rather prominent under the second heading are a number of abstracts from the rapidly growing literature of therapeutic hypnotism.

— The R. S. King Publishing Company, Chicago, have in press "The Story of America," by Elia W. Peattie, an historic narrative, arranged especially for young people. Many of the illustrations have been designed and engraved especially for this book. It is intended to be used as a text-book or supplementary reader in schools, as well as for general reading.

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.

The Soaring of Birds.

SINCE my return to Cambridge, I find that a rather extensive correspondence has collected upon the above subject. I admit the force of Mr. Gilbert's criticism on the medium with uniform motion, and, that being the case, need not defend the theory from the criticism of Professor MacGregor, further than to say that the force which he calls number (2) is not due to friction, and that he has misunderstood my meaning. As the original theory, in that form, is withdrawn, it is unnecessary to discuss it further in *Science*.

In regard to Mr. Gilbert's explanation, I must say that I cannot yet accept his horizontal-layer theory. The very essence of a bird's soaring is that he shall continually rise higher and higher, not continue to circle at one level. If the bird rises higher and higher, we must have a succession of these layers of air, the upper ones a few thousand feet from the ground moving with a velocity very much higher than is usually attributed to the clouds, or else a series of layers moving alternately fast and slowly, which seems to involve an hypothesis which we have no other ground save this theory for believing.

Moreover, if all the bird has to do is merely to dip from one moving layer of air into another, why should not small birds soar? Take the swallow, for instance, — a most excellent flier, and quite capable of travelling with outstretched wings for a few seconds; yet he is never known to maintain himself in the air circling for five or ten minutes at a time, or by the hour together, as do the larger birds.

But why make any new assumptions with regard to the atmosphere? Why not take the phenomena with which we are all of us familiar? Whenever there is a high wind, such as is undoubtedly required by a soaring bird, we know that the air-pressure is not uniform, that the wind comes in gusts. Those familiar with mountain summits know that the same phenomena are observed in the upper atmosphere as at the surface of the ground. If we were travelling along with such a wind in a balloon, the gusts would not be so severe, but they would be of longer duration.

A ——————————— B

Imagine, now, a bird travelling from A to B, in the same direction as the wind, and with its mean velocity. When the wind is uniform, it seems to him that he is in a dead calm. When a gust comes, the wind seems to blow from A. It carries him along faster; and when it ceases, the wind seems to blow from B. It therefore affects him precisely as if he were in an alternating current of wind.

Suppose, now, that he is drifting towards B with a velocity equal to that of the wind, and travelling at right angles to AB with such a velocity that he can move along horizontally without falling towards the earth. Suddenly a gust overtakes him from the direction of A. He at once turns towards it, and his velocity relative to it is sufficient to raise him in the air. It tends to carry him more rapidly towards B; and when his velocity relative to it has sunk to the same value as before, and he again travels horizontally, he turns again at right angles to the line AB, but in the opposite direction to that which he had before. Presently the force of the gust diminishes, and the wind seems to blow towards him from the direction A. He accordingly turns towards it again, rising from the ground till his velocity relative to the air has assumed its former value, and he moves horizontally, turning again at right angles to the line AB, and the cycle is completed. He thus moves along in the direction AB with a mean velocity equal to that of the wind, rising when moving parallel to it, and moving horizontally, or perhaps slowly falling, if the gusts do not come with sufficient frequency, when moving at right angles to it.

In the case of all soaring birds, the spread tail, being an inclined curved surface, presents a large area to the wind. As it is situated at a considerable distance from the bird's centre of gravity, it must convert him into a sort of floating weather-cock, the wings serving as dampers to restrain him from turning too quickly. It therefore appears, if soaring really does depend on the interaction of varying wind-currents, as if the changes of direction involved must be almost automatic, and not a thing which the bird is required to learn; although he may doubtless learn to take advantage of favoring currents by giving proper inclinations to his wings and tail.

If the question be raised as to the sufficiency of the varying intensity of the wind-currents to maintain the bird's initial velocity against the resistance of the air, we must reply that it is a matter which can only be determined conclusively by experiment. Certain it is, however, that in windy weather the wind does come in gusts. If in the course of his circles the bird happens to be travelling at right angles to the wind, when the gust strikes him he will surely be turned round, almost in spite of himself, so as to face the gust. If the bird does face the gust, it will certainly raise him to a higher level.

If this explanation proves to be the true one, the reason why small birds cannot soar is probably, that, in those of them that have suitably shaped wings and bodies, their surfaces are so large in proportion to their weights that they rapidly assume the velocity of the surrounding air. In order that they might soar to advantage, the gusts should come more frequently, and be of shorter duration, than we actually find to occur in nature.

WM. H. PICKERING.

Harvard Observatory, Cambridge, Mass., March 21.

Definition of Manual Training.

I HAVE just seen in your pages (*Science*, xiii. p. 9) the excellent definition of "manual training," given by the New Jersey Council of Education. But the name is already too familiar in various vaguer uses, and especially for training to fit for manual labor: hence there would be great advantage if a fresh name were applied. Would not "manu-mental training" do admirably? It expresses the precise idea in such a way that a mistake as to its meaning is impossible.

J. E. CLARK.

Bootham, York, Eng., March 15.

Curves of Literary Style.

AFTER reading the communication on "Curves of Literary Style," in the last number of *Science*, I counted the words in 300 sentences towards the last of Carlyle's "French Revolution," and found the curve, when plotted, to agree very closely with your correspondent's as published, though there were several longer sentences interspersed, showing that the passages examined were from a different part of the work. This was very satisfactory; but the same method of examination, applied to the first 300 sentences of Carlyle's "Sartor Resartus," gives a very different result, the curve corresponding pretty closely with that given for Johnson's "Rambler." This goes to show, if it does not prove, that for detective purposes the method is valueless. All compound words and phrases connected by hyphens were counted as single words only. The 300 sentences filled 30 out of 200 pages of the edition used.

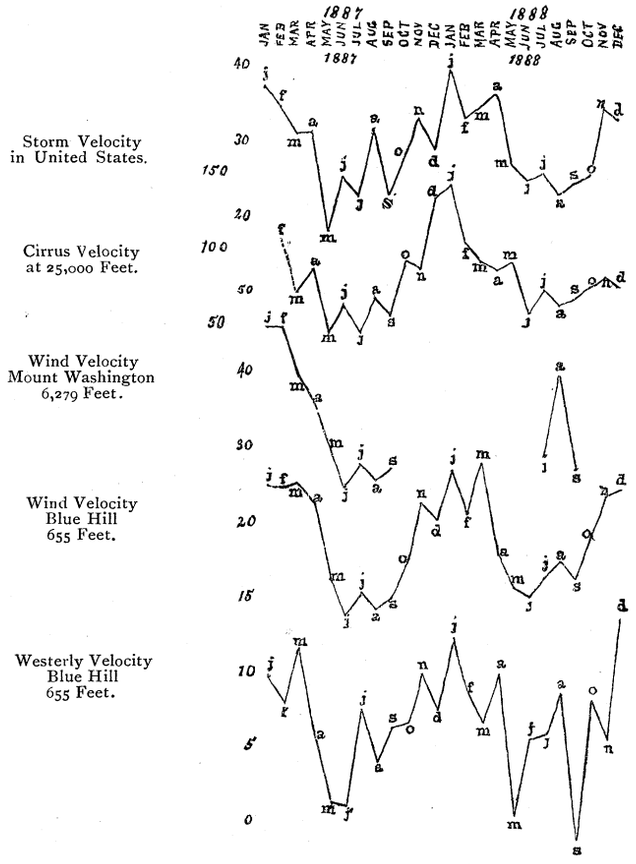
H. A. PARKER.

Cambridge, Mass., March 25.

The Velocity of Storms as related to the Velocity of the General Atmospheric Movements.

IT has for a long time been maintained by some meteorologists that the chief cause of the progressive movement of storms is that these atmospheric disturbances are carried along by the general movements of the atmosphere, as eddies on the surface of a river are borne along by the current in which they exist. The German meteorologists Van Bebber and Köppen have especially insisted on these views, maintaining that the direction and velocity of storms are determined by the mean motion of the entire atmosphere in which they exist; and Gen. Greely has recently, in the *American Meteorological Journal*, educed the recorded wind-velocities on Mount Washington as favoring this view.

In order to study this and allied questions, the writer began two years ago a systematic series of observations on the clouds. These observations were made hourly between 7 A.M. and 11 P.M. Facil-



ities were not available for obtaining the actual velocities of the clouds, and it was hence necessary to be content with obtaining the apparent velocities. These were obtained by means of a nephoscope devised by the writer. The nephoscope consists of a horizontal mirror held in a frame carrying an eye-piece movable along vertical and horizontal arches, so that the direction of cloud-movements can be determined in degrees of azimuth. To obtain the relative velocity, a movable support is so arranged, that, when the observer's forehead is rested on it, the retina of the eye is maintained at a constant height of seven inches above the surface of the mirror. When the eye is in this position, the number of quarter-inches which the image of a cloud is seen to move across the mirror in a minute is taken as the relative velocity of the cloud. It is evident that the relative velocity of the cloud thus obtained bears a relation to the actual velocity; and, if the height of the cloud be known, its absolute velocity relative to the earth's surface