high atmospheric pressure on the ear in tunnels, caissons, and in diving; and the subject of pension claims of soldiers, sailors, and marines on account of disability from deafness. Dr. Sexton has enjoyed remarkable opportunities for observing diseases of the ear, sixty thousand cases having come under his charge during the past twenty years, and is therefore entitled to speak with authority on all subjects connected with this important organ.

The author first treats of the anatomy and physiology of the auditory apparatus. He regards the theory of audition as set forth by Helmholtz as faulty, and accepts as the true explanation of the process the views of Professor Rutherford, announced by him in a lecture delivered before the British Association, and published in the *Lancet*, Jan. 1, 1887. Rutherford's theory is called by him the 'telephone theory of the sense of hearing,' for the reason that the processes in the two instances are so much alike, and a knowledge of the manner in which the telephone acts helps to explain the function of audition.

We have already had occasion in *Science* to refer to Dr. Sexton's views of the injurious effects of sea-bathing on the ear. Bathers in the surf are liable, when off their guard, to be struck by the waves upon the ear with much violence, especially in boisterous weather at full tide. Cold salt water may thus enter the external auditory canal with sufficient momentum to rupture the drum-head in persons having a large, freely open canal. Swimming or floating upon the back exposes one to the same dangers. There have been 273 patients under Dr. Sexton's treatment for aural disease caused by salt-water bathing, of whom 243 were males, and 30 females. Injury to the ear sometimes follows fresh-water bathing; and in Russian or Turkish baths there is also danger, the bather being at this time extremely susceptible to cold, and consequent catarrh of the upper air-passages.

The author has observed 51 cases of injury to the ear by blows of the open hand or fist, and 16 in which disease was attributable to missiles of various kinds, five being snow-balls.

One of the most interesting portions of the work before us is that which treats of injuries produced by long-continued musketry-fire, by the concussion from the blast of fire-arms and explosives, and by the impact of steam-whistles, metal-hammering, and other intense sounds. A large number of cases are described in detail illustrative of these injuries, many of them having occurred during the war of the Rebellion.

Defective school hygiene Dr. Sexton regards as one of the causes of ear-disease. Much has been written of the ills that arise from breathing foul gas and dust, and very little about the dangers from draughts of air to which pupils are exposed in many schools. Catarrh with aural complications results from this cause.

A large experience has led the author to believe that great injustice is being done in permitting children to struggle for an education, under the disadvantages arising from deafness, without the aid of methods which experience has shown to be advantageous in such cases. He found 76 cases of deafness in 570 pupils examined in the public and parochial schools of New York City; while, of this large number of children, but one was known to the teachers as suffering from deafness, and only nineteen were aware that they were deaf. As a result of Dr. Sexton's labors, teachers are much interested in the subject, and find that deafness explains many cases of supposed 'inattention' and 'stupidity.' The author states that careful estimates show that only five per cent of the population of the United States have normal hearing. He finds deafness to exist to a certain extent among teachers as well.

A chapter is devoted to the effect of high atmospheric pressure on the ear in tunnels, caissons, etc., which contains illustrative cases, some of the injuries being produced in the Hudson River Tunnel, and one in the caisson of the Harlem River Bridge. The injurious effects of unskilful treatment in the removal of foreign bodies from the ear are described. There can be, he says, no more pitiable object than a child, terror-stricken and exhausted with fear, struggling in a frenzied way while the ear is painfully lacerated in unskilful attempts at the removal of a foreign body. This operation should only be done by one skilled in the proper methods.

The claims of soldiers, sailors, and marines for pensions on account of disability from deafness is the topic discussed in the final chapter. Under the present law, thirteen dollars per month (a full pension) is the whole amount allowed for total or severe deafness of both ears, with a proportionate amount for partial loss of hearing in one or both ears. On March 1, 1886, 1,230 persons were drawing pensions for total deafness, and 4,159 for partial deafness, — a total of 5,389. A table is given showing the rates of payment, with the aggregate for each State and Territory. Fifty-nine illustrations and a copious index add much to the value of this excellent work.

Town and Country School Buildings. By E. C. GARDNER. New York and Chicago, E. L. Kellogg & Co. 12°.

THIS book is inexpensive and it is unpretentious, but it is full of valuable suggestions. Our schools, especially in the rural districts, are generally buildings of consummate ugliness and inconvenience. The village carpenter builds them, box-like, and is satisfied. It costs no more, however, to build an attractive and well-arranged school than the opposite, if only the builders are shown how to do it. Mr. Gardner's little book serves this purpose admirably. By cuts and diagrams, and by specific building directions, the subject is presented in an attractive and practical way. The book should be often consulted by district school trustees.

Macmillan's Greek Reader. By F. H. COLSON. London and New York, Macmillan. 16°. 75 cents.

A Latin Reader. By H. J. HARDY. London and New York, Macmillan. 16°. 60 cents.

MR. COLSON'S 'Greek Reader' is an attempt to give a collection of stories in Attic Greek taken from originals. As the Greek authors whose writings contain anecdotes, historical and mythological, which form so suitable a subject-matter for school-exercises, belong to a later period, they do not form a good introduction to the study of the great Attic prose writers. On the other hand, such readers as contain interesting stories, that are taken from any source and turned into Greek, labor under the disadvantage that the material is not original, but a translation. The author has avoided this difficulty by selecting stories Greek in substance and form, but simplified, and adapted to the form of ordinary Attic Greek. The stories are arranged by subjects, not as to their difficulty, but the more difficult ones have been marked by asterisks. A full vocabulary and exercises are contained in the volume.

Mr. Hardy's 'Latin Reader' consists of Latin stories taken from Latin authors and other sources. An attempt has been made to gather compact and intelligible stories, the subjects of which may be expected to interest the average schoolboy. These stories are intended for the ordinary reading of boys who are not yet sufficiently far advanced to read Latin authors continuously. They conclude with some pieces taken directly from the authors which will naturally form the next stage; otherwise all the stories are intended for the lower forms of schools. A useful vocabulary is appended to the book.

NOTES AND NEWS.

THE American Institute Fair, which will close early in next month, attracts attention, as it well deserves, from the resident New-Yorkers and those who visit the city. The exhibition hall, at Sixty-third Street and Third Avenue, is convenient of access by the elevated railways and street-car lines. With the building filled with a variety of exhibits, covering almost every branch of industry, and the machinery hall containing about one hundred different exhibits, and a Corliss engine working without fault, and pronounced by competent judges to be as fine a piece of mechanism as has ever been seen even in New York, and with an art department complete, and household exhibits without number, — and all this at the reduced admission of twenty-five cents, — there is no reason why an investment of money and an investment of time to visit the fair should not be made, and good return received for going. The building is open from 10 A.M. to 10 P.M.

— G. Gröber's *Grundriss der romanischen Philologie* has now arrived at its third number, which completes the first volume. The work, which is published by Trübner at Strassburg, is a cyclopedic collection of grammatic, literary, and paleographic articles upon

the Neo-Latin languages of southern Europe, contributed by twenty-five specialists. The originator and digester of this literary enterprise has evidently secured the best talent obtainable for the purpose, and the wealth of information contained in the 853 pages of the handsome volume is simply overwhelming. The almost infinitely numerous dialects are examined as carefully as the literary form of each Romance language, and whole pages are devoted to the history and literary history of the dialects, and the metrics, stylitics, and philologic transmission of the principal languages from their earlier stages down to our times. Attention was also paid to those extinct tongues which have or may have influenced the formation of the Neo-Latin languages, as Oscan, Umbrian, Etruscan, Celtic, Basque, etc. Prof. G. Gröber, W. Schum, A. Tobler, and others have furnished treatises of more general import upon Romance studies, whereas the French and Provençal was treated grammatically by H. Suchier, Italian by Fr. d'Ovidio and W. Meyer, and Spanish by G. Baist. The second volume will be devoted especially to the history of the different literatures of the Romance tongues.

— Beginning Jan. 5, Prof. W. O. Crosby will give a course of ten lessons before the Teachers' School of Science of the Boston Society of Natural History.

— The Geological Survey of Kentucky has just published a report on Bath and Fleming Counties by W. M. Linney, which is accompanied by a good geological map. A detailed geological description of the counties, and notes on their mineral products, mineral waters, and agricultural resources, are given. An appendix contains notes on the rainfall at Sharpsburg from January, 1859, to September, 1885. The Preston Ore Banks in Bath County are treated at some length.

— The New England Meteorological Society proposes to have a loan exhibition of meteorological apparatus, photographs, etc., at the Institute of Technology, Boston, in connection with its fourteenth regular meeting in January, 1889. For this purpose the society invites contributions of meteorological apparatus, photographs, and charts and specimens. Articles should be sent to A. Lawrence Rotch, Massachusetts Institute of Technology, Boston, by prepaid mail or express, not later than Jan. 12, 1889, and preferably immediately. Communications regarding the exhibition should be marked "Loan Exhibition," and addressed to A. Lawrence Rotch, Blue Hill Observatory, Readville, Mass.

— The American Forestry Congress convenes at Atlanta, Ga., on the 29th of November, and the annual meeting of the Association of Agricultural Colleges and Experiment Stations occurs at Knoxville, Tenn., Jan. 1.

— Notwithstanding the considerable difficulties which have been met with in the digging of a canal to connect the Obi with the Yenisei, and the want of money for the completion of the undertaking, the work of connecting the two great arteries of navigation in Siberia is still advancing. *Nature* says that in the summer of the present year a boat 56 feet long and 14 feet wide, taking 3½ feet of water, was drawn from the Obi into the Yenisei with a load of 40 tons of flour. The two rivers are 630 miles apart.

— N. M. Prjevalsky, the famous explorer of Central Asia, died at Vyernyi when preparing his fifth expedition to Tibet. Prjevalsky, in his four expeditions to Central Asia, has laid the foundation of our knowledge of these remote regions. On his first expedition he explored Mongolia and the country of the Tangutes. The Russian Geographical Society awarded him the great Constantine medal for this expedition; but, however important the results were to the science of geography, they were far excelled by those of the second expedition, on which he rediscovered the Lob-nor. His principal aim in all these journeys was to reach Lhassa. On his third journey, when the obstacles presented by deserts and difficult mountain-ranges were overcome, and the explorer was approaching Lhassa, he had to turn back, as the Dalai Lama forbade him to enter the great Buddhistic capital. On his fourth journey he explored the upper Hoangho, but was unable to penetrate into Tibet. He returned by way of East Turkestan. The object of his fifth journey was to reach Lhassa, and it appeared as though the political situation would be favorable to the enterprise. His untimely death will be regretted by all geographers. Prjevalsky was only in his fiftieth year. His energy and love of travel and exploration were indomitable, and undoubtedly important results would have accrued from his further work. He has shown how to explore the highlands of Central Asia; and, although he himself is gone, he leaves a number of enthusiastic followers, who have accompanied him during his journeys, and who will undoubtedly continue his great work.

— *The Open Court* of Nov. 15 contains a discussion of 'The Marriage Problem,' by Prof. E. D. Cope. —— In the December number of *The Chautauquan* are to be found 'Gossip about Greece,' by J. P. Mahaffy, M.A., of Dublin University; 'Pericles,' by Thomas D. Seymour, M.A., of Yale University; 'Greek Mythology,' by James Baldwin, Ph.D.; 'Sunday Readings,' selected by Bishop John H. Vincent, D.D., LL.D.; 'The Circle of the Sciences,' by Prof. A. P. Coleman, Ph.D., of Victoria University; 'The Indians of the United States,' by J. B. Harrison; 'The Red Cross,' by Charles Barnard; 'The Bessemer Steel Rail,' by J. C. Bayles; 'The Charities of Buffalo,' by J. W. Bashford, Ph.D.; 'Count Tolstoï's Theories,' by Anatole Leroy-Beaulieu; 'The Yankee Privateer,' by Arthur Hale; 'Lost Explorers and Expeditions,' by Lieut. Frederick Schwatka; 'The Moravian Mecca,' by Bishop John F. Hurst, LL.D.; 'Talks on Memory,' by Prof. Wilbert W. White; 'Louisa May Alcott,' by Harriet Prescott Spofford; 'Scientific Temperance' (a symposium of letters from eminent physicians), and 'The Dinner of Callias,' translated from the *Symposium* of Xenophon, besides the usual editorial and C. L. S. C. departments. —— The Saranac and Lake Placid regions of the Adirondacks, as they appear in mid-winter, will be described in the Christmas *Scribner's* by Hamilton Wright Mabie.

— A vocabulary to the first six books of Homer's 'Iliad,' by Prof. Thomas D. Seymour of Yale College, is to be published in March, 1889, by Ginn & Co. This vocabulary has not been compiled from other dictionaries, but has been made from the poem itself. The maker has endeavored to be concise, — to give nothing but what is important for the accurate and appreciative reading of the 'Iliad,' — and yet to show the original and derived meanings of the words, and to suggest translations which should be both simple and dignified. A confident hope is felt that the concise form of this vocabulary will save much time for the beginner in Homer. More than twenty woodcuts, most of which are new in this country, illustrate the antiquities of the 'Iliad.' —— D. C. Heath & Co. have recently issued 'Hodgkin's Studies in English Literature,' which gives full lists of aids for laboratory method (a separate pamphlet is issued for each author); 'Fontaine's Historiettes Modernes,' Vol. I., being short and easy stories for beginners; and 'Van Daell's Leander's Mærchen,' with notes for elementary or rapid sight-reading. The same firm will soon add to their series of French texts for schools and colleges, 'La Belle Nivernaise, Histoire d'un Vieux Bateau et de son Equipage,' by Alphonse Daudet, with 6 illustrations; and 'Bug Jargal,' by Victor Hugo, — both edited by James Boïelle, senior French master at Dulwich College, England; also Scribe's 'Le Verre D'Eau' and Lamartine's 'Jeanne D'Arc' (these last are to be edited by A. Barrere, professor of modern languages in the Royal Military Academy, Woolwich, England); also a translation of Paolo Mantegazza's 'Testa, a Book for Boys,' — a companion book to DeAmicis's 'Cuore.' The translation will be made under the supervision of Prof. L. D. Ventura of Boston, and of the Sauveur Summer School of Languages. —— Messrs. Ginn & Co. will have ready about Dec. 15 a new edition of Allen & Greenough's 'Latin Grammar.' The revision of eleven years since has stood the tests of every-day use; but from the day of its publication the book has been studied to find where it could be made better in either great or little points, and the results of this study are given in the present revision. With Collar and Daniell's 'Beginner's Latin Book,' the new 'Grammar' and the new 'Cæsar,' 'Cicero,' and 'Virgil,' followed and supplemented by Collar's 'Practical Latin Composition' (now in the printer's hands), and the forthcoming College Series of Latin Authors, with many other texts, teachers in this department will find most serviceable Latin text-books.

— 'The Old Northwest: with a View of the Thirteen Colonies as constituted by the Royal Charters,' by B. A. Hinsdale, Ph.D., constitutes No. 2 of Mac Coun's Standard Historical Series. 'The Old Northwest' is a guide to the historical facts of State, Federal, and Inter-State legislation in connection with their formation, development, and admission into the Union. —— P. Blakiston, Son, & Co. have just published a second edition of 'Medical Jurisprudence and Toxicology,' a text-book for medical and legal practitioners and students, by John J. Reese, M.D.; and 'The Physician's Visiting List for 1889,' being the thirty-eighth year of Lindsay and Blakiston's 'Physician's Visiting-List.'

LETTERS TO THE EDITOR.

Anemometer Constants.

THE last volume of the *Repertorium für Meteorologie* (Vol. XI. No. 7), just received, contains a paper by Dubinsky ('Vergleichende Verification zweier Anemometer in Hamburg, Deutsche Seewarte, und in St. Petersburg, Physical Central-Observatorium'), giving the results of comparative tests of two Robinson anemometers of very small dimensions, and using for this purpose the two whirling-machines respectively at Hamburg and St. Petersburg.

These experiments are of special interest to the writer, who was himself engaged during the past summer upon similar work for the Signal Service, and used, with the larger anemometers of the service, a very small one for studying certain parts of the problem. In this work the whirling-machine was very large, having an arm twenty-eight feet long, which in later experiments was increased to thirty-five feet. It is not intended at this time to speak further of this work, but to notice in a few remarks the method (pp. 11 *et seq.*) used by Mr. Dubinsky to ascertain a very important correction, and to compare his results with those obtained by Dohrandt (*Rep. für Met.*, Vol. IV.–Vol. VI.), who had already used the St. Petersburg machine in making a large number of experiments upon anemometers of the ordinary sizes.

The two whirling-machines, which are permanently set up in closed rooms, are nearly the same in size; that at St. Petersburg being much like a letter T in form, and adapted to be revolved about the central stem as an axis, carrying the anemometer to be tested on the outer end of one or the other of its horizontal arms, which are about eleven feet long. In the Hamburg machine one arm is quite short, and carries a counterpoise; the other is between twelve and thirteen feet long.

In using such whirlers, there is a tendency of the arm and other moving parts to set up a slow rotation in the air, as a whole, through which they revolve. This movement of the air with the arm is called by the Germans, and aptly so, the *Mitwind*. The determination of its amount is one of the most serious obstacles to overcome in experiments of this kind.

Results seem to indicate a pretty close proportionality of this *Mitwind* to the velocity of the arm; and Dohrandt concluded from his studies that in value it was about 5 per cent of the latter. Dubinsky, working with relatively very much smaller anemometers, though using the same whirling-machine, adopts 7.3 per cent as the correction for the *Mitwind*. The discrepancy in these results is really larger than it appears, when it is considered how much less the small anemometers would tend to generate *Mitwind*, as compared with those used by Dohrandt.

A brief description of the method of measuring the *Mitwind* will aid in understanding the question. For this purpose both experimenters placed close to the path of the whirled anemometer a delicate air-meter, with its axis tangent to the orbit. Its indications during the progress of an experiment give a measure of the *Mitwind*, however, being strongly acted upon by the violent disturbance of the air which immediately attends and follows just after the passage of the whirled anemometer, and which cannot be considered as a true *Mitwind*. The velocity given by the air-meter is no doubt, as Dohrandt points out, much greater than that of the true *Mitwind*.

The treatment by Dubinsky, of this observed velocity, to reduce it to the *Mitwind* velocity, is practically the same, at least in intent, as the expedient resorted to by Dohrandt (*Rep. für Met.*, Vol. IV. No. 5, p. 39), who placed on the end of the unoccupied arm of the whirler a small air-meter, which was thus carried in the path of, but diametrically opposite, the whirled anemometer. The whirling-machine is revolved, first with both anemometer and air-meter in position, and then with the air-meter alone. Owing to a decrease in the *Mitwind* attending the removal of the anemometer, the whirled air-meter registers a larger number of units in the second case than in the first; and the difference, in terms of velocity, is considered by Dohrandt as the *true value* of the difference between the *Mitwinds* in the two cases. Not questioning the correctness of this assumption, a comparison of the difference thus obtained with that derived from the indications of the stationary air-meter shows the latter to be from two to three times the former or presumed true difference. Finally, it is further assumed that the whole observed *Mitwind* and the true are in the same proportion. Or, if v_1 and v_2 are the velocities indicated by the air-meter when whirled with and without an anemometer, and x_1 and x_2 the corresponding velocities of observed *Mitwind*, we have, the velocity of the arm being the same in both cases,

$$\frac{v_2 - v_1}{x_1 - x_2} = a;$$

and the true *Mitwind* is $a \times$ observed *Mitwind*.

In applying this method, Dubinsky whirled both of the small anemometers, one on each end of the arm, and then one alone, using the stationary air-meter for observing the *Mitwind* in each case. This substitution of the small anemometer — an instrument equally influenced by equal winds in a horizontal plane, whatever their direction — for an air-meter not thus influenced, is an important modification of Dohrandt's method, and may serve to account for a part, at least, of the difference found in their results. Dubinsky has, apparently without being aware of its peculiar merits, hit upon what is believed to be a more proper method of investigating *Mitwind* than any heretofore used: that is to say, the *Mitwind* anemometer must be of the same form as the anemometer being tested, as it is evident the instrument used for measuring the *Mitwind* must be influenced thereby in the same manner, and to the same extent, as the instrument whose constants are being determined.

Throughout the tests upon the small anemometers the *Mitwind* was carefully observed by means of a stationary air-meter, and 7.3 per cent of the arm-velocity was adopted as its value at St. Petersburg, 7.6 per cent being the value found at Hamburg. A single experiment only is cited, by which the value of the factor a was determined, and is as follows: —

	v_0 Velocity of Arm. Kilometres per Hour.	c Contacts per Hour of Anemometer No. 74.	x Mitwind. Kilometres per Hour.
With both anemometers	62.24	60.04	4.91
With No. 74 alone	62.56	60.56	4.68

The paper further states that in the second case, had the velocity of the arm been 62.24 instead of 62.56, the recorded contacts of No. 74 would have been 60.27. Hence we have

	v_0	c	x
	62.24	60.04	4.91
	62.24	60.27	4.68
Differences		0.23	0.23

The author, apparently too hastily, jumps at the conclusion, and places

$$\frac{0.23}{0.23} = 1.00$$

as the value of the factor a, and in consequence applies all of the 7.3 per cent observed *Mitwind* as the correction for that disturbance. It is to be observed that the first 0.23 in the line of differences is in terms of *contacts per hour*, and is not a velocity. Further