Owing to the intense heat which had prevailed throughout the entire meeting, there was but a comparatively small attendance upon the final session of section E on Thursday morning. A large proportion of those down on the programme for papers had already left town; and almost the only communications of real interest which appeared were those of Professors Julien and Bolton, regarding the results of their examination of various sands. Starting some time since with a study of the so-ca led 'musical sands' occurring on the Manchester beach, they have been gradually led to extend their researches to sonorous sands from many other localities, both American and foreign; and finally to include within them a study of all ocean, lake, and river sands, whether sonorous or not. So far from being rarities, as they were considered some years ago, sonorous beach-sands are found to have an exceedingly wide distribution. Already seventy-four American and thirteen foreign localities are known, and the number is constantly increasing. The loudest sound may be produced by suddenly bringing together two divided portions of the sand enclosed in a bag. When suddenly compressed between the hands, musical notes are emitted, the pitch rising as the quantity is diminished. The conditions of sonorousness, Professor Julien considers to be perfect dryness, uniformity of grain ranging from 0.3 to 0.5 mm. in diameter, and freedom from dust. Any sand satisfying these conditions, no matter what be its nature, he thinks may be musical. Sonorous sands, when wet, generally become quicksands. The microscopic study of a large number of sands of all kinds showed that a great variety of minerals participated in their composition. No such thing as a pure quartz sand was discovered.

In place of the regular session Thursday afternoon, the section was treated to an excursion over the Reading railroad, under the guidance of Professor H. Carvill Lewis. Various points where different formations occur were visited, and the complications of the local geology about Philadelphia were explained as far as understood.

NOTES AND NEWS.

THE semi-annual scientific session of the National academy of sciences will be held in the court-house, Newport, R.I., Oct. 14, 1884, at 11 o'clock, A.M.

— An interesting study of the bed of the Delaware River has just been published by the U. S. coast-survey. It is the report of Henry Mitchell on the methods which have been followed, and the results which have been reached, in recent surveys of what is termed 'the estuary of the Delaware,' from Philadelphia to a point fifty-two miles below. He uses the term 'estuary;' because farther down the stream, there is a submerged delta, with numerous channels, 'not unlike the passes of the Mississippi, or more like those of the Ganges after its issue upon the Bay of Bengal.' The laborious character of this survey may be understood by the statement that seven hundred and thirty-four cross-sections have been measured, with widths varying from one to five miles, and including many thousand soundings. Professor Mitchell speaks in terms of high praise of the skill with which this work was performed by Mr. J. A. Sullivan of the coast-survey. The point of greatest physical importance is that of the mean depth of the estuary, the bed of which varies so little that the generalized result is best expressed by a horizontal straight line. The fluctuations are chiefly due to inequalities in the nature of the soil. The grand mean of all the soundings is 18.64 feet. The brief report of Mr. Mitchell includes many interesting comments upon the formation of an estuary, to which we can only make this brief allusion.

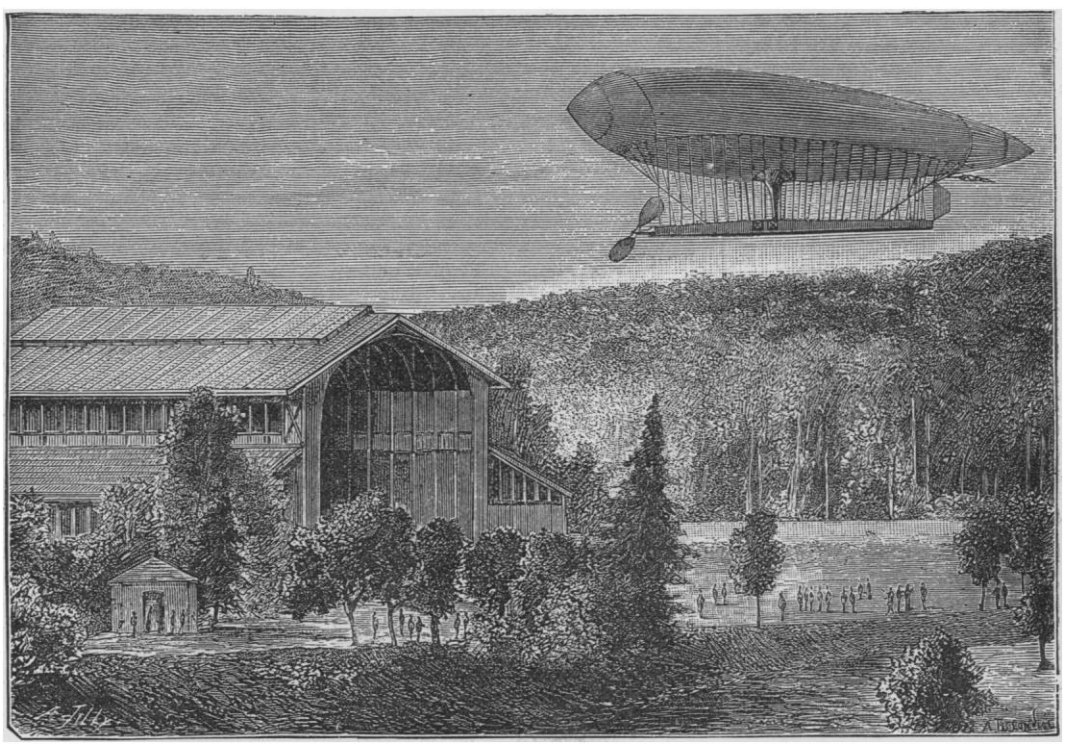
— Besides those whose names we previously published, the following gentlemen signed the request to the British and American associations, to consider the formation of an international congress. The list is striking as revealing the great extent of the interest felt in the undertaking. The names referred to are: George J. Brush, James D. Dana, James Hall, J. E. Hilgard, J. S. Newberry, Charles A. Young, Charles E. Bessey, William J. Beal, Edward S. Morse, William A. Rogers, Robert H. Thurston, John Trowbridge, J. Burkitt Webb, N. H. Winchell, De Volson Wood, charles C. Abbott, William Ashburner, W. O. Atwater, ML . Britton, Robert Brown, jun., W. H. Chandler, Alvan G. Clarke, E. W. Claypole, Joseph Cummings, George Davidson, A. E. Dolbear, Louis Elsberg, S. F. Emmons, J. Fletcher, S. A. Forbes, Simon H. Gage, James T. Gardiner, S. A. Goldschmidt, William H. Greene, Horatio Hale, William B. Hazen, Angelo Heilprin, S. W. Holman, Horace C. Hovey, Alexis A. Julien, Joseph Leconte, J. Loudon, N. T. Lupton, George McCloskie, B. Pickman Mann, H. N. Martin, Alfred M. Mayer, T. C. Mendenhall, William H. Niles, James Edward Oliver, Edward Orton, Richard Owen, A. S. Packard, D. P. Penhallow, W. H. Pickering, William H. Pike, Edmund Baynes Reed, Ira Remsen, John D. Runkle, I. C. Russell, William Saunders, B. Silliman, Eugene A. Smith, Francis H. Smith, Q. C. Smith, M. B. Snyder, Ormond Stone, W. Hudson Stephens, Albert H. Tuttle, Warren Upham, Lester F. Ward, M. E. Wadsworth, Charles D. Walcott, Leonard Waldo, Robert B. Warder, Sereno Watson, Charles Whittlesey, Burt G. Wilder, Alexander Winchell, Henry S. Williams, Jacob L. Wortman, Arthur W. Wright, E. L. Youmans, Joseph Zentmayer.

— Dr. Edward Channing received in 1883 the Toppan prize of Harvard university, and the essay which won this distinction has just been printed as one of the Johns Hopkins university studies in history. The theme was the town and county government in the English colonies of North America. The author is led to compare the Massachusetts system of local government with that of Virginia, and to show that both are survivals of the English common-law parish of 1600. The essay concludes with a tabulated statement of local government in England, Massachusetts, and Virginia; by glancing at which, the reader may

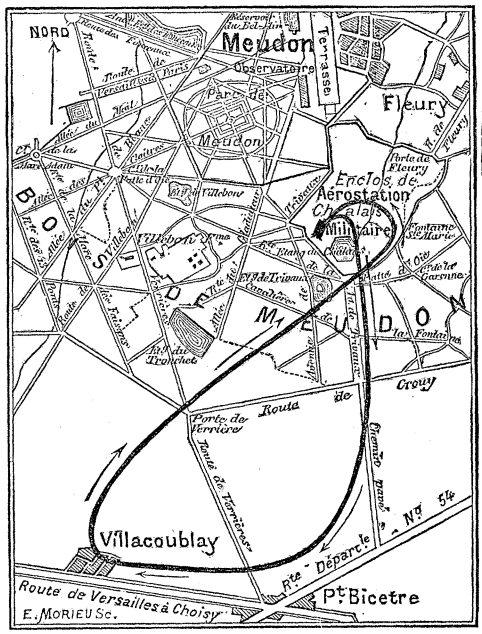
quickly comprehend the diversity of usage proceeding from the same stock.

— The new steering apparatus for balloons invented by the two French officers of engineers, Capt. Renard and Capt. Krebs, is attracting considerable attention in warlike Europe. The experiments, for which Gambetta during his short lease of power obtained a grant of 100,000 francs, have been conducted for six years past in the forest of Meudon with the greatest secrecy. The two officers have admittedly been guided in their studies by the earlier labors of Mr. Duprey de Lôme in 1870–72. The conditions laid down by the inventors themselves were stability of passage obtained by the cigar-shaped form of the balloon and the arrangement of the rudder, diminution of the resistance of the air by the choice of dimensions, and realization of a speed capable of resisting the winds generally prevalent in France. Capt. Renard undertook the more strictly scientific part of the work, and Capt. Krebs the rest. The former invented the new electric pile of exceptional lightness and power; and the latter constructed the screw and the rudder, and the apparatus for the electric motor. The balloon is formed in the shape of a cigar, pointed at both extremities; a net hangs from it, containing seats for two aëronauts, a directing apparatus, and a rudder. It is stated that the force is obtained by a series of electric accumulators of ten horse-power, which may be operative during four hours. Of their first trip, the inventors made the following report:—

"On Aug. 9, at four P.M., with the wind almost calm, the aërostat, with little ascensional power, rose slowly to the height of the surrounding uplands. The machine was put in motion; and soon the aërostat increased its speed, obeying the slightest movement of its rudder. The route was first held north and south, toward Châtillon and Verrières, above the road from Choisy to Versailles; and, in order not to become entangled among the trees, the direction was changed to Versailles. Above Villacoublay, we were about four kilometres from Chalais; and, perfectly satisfied with the behavior of the balloon, we decided to return and to descend at Chalais, notwithstanding the narrow space allowed by the trees. The balloon was successfully turned to the right, the rudder making a small angle (about eleven degrees). The diameter of the circle described was about three hundred metres; the dome of the Invalides, taken as the point of direction, was a little to the right of Chalais. After arriving above this point, the balloon was easily turned to the left; and soon it was hovering three hundred metres above its point of departure. It was necessary to work the machine backward and forward, in order to bring the balloon above the place chosen for the descent. At thirty metres above the ground, a rope dropped from the balloon was seized, and the aërostat was brought down in the very meadow whence it had set off.



Several times during the trip, the balloon underwent oscillations of from two to three degrees, resembling pitching; these oscillations were attributed either to



irregularities in the shape, or to currents of local air rising vertically." The balloon is 50.42 metres long, and 8.40 metres in diameter. The course taken, shown in accompanying map, was 7.6 kilometres long, and was finished in twenty-three minutes.

— We learn from the New-York branch Hydrographic office, that the bark Stillwater, Capt. Goudey, from Manilla to New York, passed through vast quantities of floating pumice from May 3 to 25 last, on its course from the Straits of Sunda until off Madagascar. From the 3d to the 8th (when in lat. 11° 49′ S., long. 95° E.), the pumice was very plentiful, with many large pieces; from the 10th to the 20th, in less quantity, with smaller pieces; from the 20th to the 25th, it was seen only occasionally, floating in long streaks with the wind. The pieces, up to six or seven inches in diameter, were covered with barnacles, by the weight of which Capt. Goudey thought it would eventually sink.

— There is hardly any subject in geographical bibliography so interesting to American scholars as the bibliography of Ptolemy's geography; and no one is better qualified than Mr. Justin Winsor to treat of it. His annotated lists of original and augmented text and translations have recently been published as *Bulletin* No. 18 of the library of Harvard university. In addition to the titles, a description is given of every edition which is mentioned, with references to bibliographers' and sales catalogues, and with indications of the American libraries where copies may be found. American collectors have been diligent in their quest for Ptolemies, so much light is thrown by them on the cartographic development of the new world. The recent dispersion of the library of Henry C. Murphy has tended to the enrichment of many other libraries. Mr. Winsor mentions that President White of Cornell university has lately added several early editions to his collection. Mr. Winsor's critical notes are full of important and recondite lore, and deserve a much more careful *résumé* and discussion than our columns can afford.

— One feature of the year in Europe is the superabundance of insect life. The roses have been fairly eaten away with green-fly (aphis); cockroaches abound, and swarms of dragon-flies are reported in Silesia; on the morning of July 1 the sky is said to have been darkened by them at Ratibor, and on the 2d the same appearance was observed for half an hour at Reichenbach, and along the North Sea coast for five miles inland the same thing has occurred.

— The twenty-fifth general meeting of the German engineers society will be held at Mannheim in September, when the most interesting public works, private manufacturing establishments, etc., will be visited by the members. A special committee will report on the law of industrial protection (patent law, registration of trade-marks, etc.), another will report on steam-boilers and engines, and another on the practical education of young engineers. Among the papers to be read is one by Professor Hermann on the graphical treatment of the mechanical theory of heat, another by Mr. L. Post on the industry of Mannheim and surroundings. This society has now fifty-one hundred members, and has twenty-nine branches in various districts.

— The death of Prof. J. C. Schioedte, a prominent entomologist, and editor of the *Naturhistorisk tidsskrift*, at Copenhagen, at the age of sixty-nine, is announced.

— About ten years ago Mr. Krupp of Essen borrowed £1,500,000 to be repaid in yearly instalments extending to 1897; arrangements have just been made, however, for repaying within a short time the whole of the sum still remaining undischarged. These great steel-works, which are now in full operation, employ 19,000 work-people in the various departments.

— The results of Dr. Müller's investigations on the absorption of gases by steel, published in the Journal of the Society of German engineers, have been thus summarized in the *Ironmonger:* "The gas liberated from steel in the liquid state before solidification is chiefly carbonic oxide. The rising of steel, and consequently the formation of blow-holes, is attributed to hydrogen and nitrogen, and to a small extent to carbonic oxide."

— A new perfect-combustion stove for domestic use has been invented by Mr. Henry Thompson, of Canonbury, England. Externally it resembles the ordinary register-stove, but in its internal construction it widely differs from it. A recess at the back of the Thompson stove is filled with coal at starting; and behind the coal is a vertical hinged plate, which

is so arranged as always to exert a gentle pressure on the coal and the body of the fire, tending to push the coal forward toward the bars. A slight stirring of the fire causes it to be loosened, and the fuel to be pressed forward to the front to replenish the fire. When the coal has been consumed, the vertical plate is pushed back, and a fresh charge of coal inserted. It will thus be seen that the coal at the back is undergoing a process of coking before being pushed forward. The gases evolved from it, instead of passing up the chimney and into the air in the form of solid carbon, are carried downwards by the draught produced by an ingenious but simple arrangement at the back of the stove, and are delivered beneath the grate. At this point they are drawn upwards through the incandescent fire, in which every particle of smoke is consumed. The waste products of combustion pass up the chimney in the usual way, but without the usual attendant results of smoke and soot.

— A lady, who requests that her name may not be divulged, has offered the University of Heidelberg the sum of 100,000 marks if women are admitted to the lectures; but the senate refused.

— Sibiriakoff's steamers, the Obi and Nordenskiold, were to leave Arckangel on the 20th of June for the Petshora and Yenisei respectively.

— The Padas, Lawas, and Limbang Rivers of north-west Borneo have been visited by Consul-general Leijs. They lie between the Brunei district and the territory of the North Borneo company. They have been visited by but very few Europeans, and only in recent years. The Limbang appears to be navigable for river-steamers about one hundred and thirty miles, the Padas for one hundred, and the Lawas for only thirty miles. In the interior, on the banks of the two former, is a relatively dense population, occupying a flat country with many sago palms. The country on the banks of the Lawas is attractive, well wooded, hilly, but sparsely populated.

— Sir Erasmus Wilson, the great authority on skin-diseases, was buried in the village churchyard of Swanscombe in Kent, on Aug. 13. He was no less celebrated for his many deeds of philanthropy than for his knowledge of his profession, though his removal of the Egyptian obelisk Cleopatra's Needle to the Thames embankment was the latest thing that brought his name into public notice. It has been stated that the College of surgeons will receive a hundred and eighty thousand pounds as his residuary legatees; the Royal medical benevolent college, the Medical benevolent fund, and the Royal sea-bathing infirmary, Margate, will receive five thousand pounds each.

— The aërolus water-spray ventilator, which was fixed eighteen months ago in the physicians' consulting-room of the London hospital, has given such satisfaction to the medical staff, that another installation of the aërolus system in the throat consulting-room has been resolved on. The new University of North Wales, at Bangor, has also adopted the system.

— The *English mechanic* states, that many of the provisional orders granted by the board of trade for electric lighting in London will be revoked at once, and unless renewed before the 15th of October, or by that time utilized, nearly all of the remainder will be revoked; so that for the present there is little likelihood of London's being illuminated by the electric light.

— A cable message to Harvard college observatory, from Dr. A. Krueger, at Kiel, anounces the discovery of a bright comet, on September 17, by Wolf (probably Dr. Wolf, of the Zurich observatory). An observation was secured at Strasburg, on the 20th, as follows: September 20.4467, Greenwich mean time. R. A. 21h., 15m., 22.3s. Decl. +22° 22′ 54″. Daily motion in R. A., +20s., in declination +26′.

— The difficulty of soldering aluminium has been one of the principal bars to its usefulness. Mr. Bourbouze has recently communicated to the French Academie des sciences a process which obviates this difficulty. He uses alloys of zinc and tin, or preferably of tin, bismuth, and aluminium, which, he says, take upon the surface of aluminium as ordinary solder does upon other metals. He, therefore, coats the aluminium with these, and any other metal with tin; and then the surfaces may be soldered as usual. For objects which are to be worked after joining, he uses a solder of forty-five parts tin, and ten aluminium, which will stand hammering and turning. For ordinary joints, less aluminium is required. The process is effected with the common soldering-iron, but nothing is said as to the use of any flux.

— A light earthquake shock, lasting ten or fifteen seconds, was felt about 2.14 standard time through Ohio and the adjoining parts of Pennsylvania, Ontario, Michigan, and Indiana. There was no serious damage caused by it; but buildings were shaken, glassware was broken, furniture moved, dishes fell from shelves, and the people in some places ran out of their houses. The strength of the shock would thus seem to be about the same as that of Aug. 10 about New Jersey. Although the Mississippi and Ohio valleys are generally accounted free from earthquakes, the following list from Professor Rockwood's notes in the *American journal of science* includes a number from that region: In 1881 there were shocks in Indiana on April 20 and May 27, and in Ohio on Aug. 29. In 1882, in Illinois on July 20; a general shock through Indiana, Illinois, Missouri, and Kentucky, on Sept. 27; and again, feebler, at midnight of Oct. 14 and 15, over a similar area; and in Illinois on Oct. 22 and Nov. 14. In 1883, about Cairo, Ill., on Jan. 11; through Indiana, Illinois, and lower Michigan, on Feb. 4; and about Cairo on April 12 and July 6.

In the newspaper reports of the earthquake of Aug. 10, it was often incorrectly stated that the shock was felt in Wilmington, N.C. This was a mistake for Wilmington, Del. The few reports of buildings overthrown, and many of the accounts of overturned chimneys, were also incorrect. Special inquiry shows the first reports to have been exaggerated as usual.