full of water. After a while the water will acquire the same velocity of rotation as the table, and will come to a state of equilibrium. The outer edge of the water in the canal will then stand a little higher than the inner edge. Let us now apply a little *motive* force to the water, and by means of a pump cause it to flow in the canal in the same direction in which the table is already rotating: it is evident that it will stand higher on the outer edge, and lower on the inner edge of the canal, than before. But, should we cause it to flow in the opposite direction to the motion of the table, it will stand lower on the outer edge, and higher on the inner edge, than in its position of equilibrium.

The experiment made by Mr. Shelford Bidwell may also be illustrated by putting a partition in the canal so as to divide it into two circular concentric troughs, and making a little opening in the partition at some point; then taking two points near the opening in the partition, one in one trough and one in the other, if they are very close to the partition, the point in the outer trough will be at a *lower* level than that in the inner one; but if they are not close to the partition, but one is taken close to the outer edge of the outer trough and the other close to the inner edge of the inner trough, then the point in the outer trough will be at a *higher* level than that in the inner trough, though the difference in level will be only about half of what it would have been had there been no partition separating the canal into two troughs. Professor Forbes called attention to the fact that the classification of the metals according to their thermo-electric qualities gives not only exactly the same division into positive and negative, but that the very *order* obtained in that way corresponds to that obtained by classifying according to the Hall effect, except *possibly* in the case of aluminium.

Prof. Silvanus P. Thompson read a paper on the government of dynamo-machines. It is a subject of considerable importance from the practical point of view, and Professor Thompson has given a great deal of thought to it. After reviewing and criticising the methods used by Marcel Desprez and Ayrton and Perry, he proposed a method devised by himself, and which he has successfully employed. It was what he calls a dynamometric method, since it is based on the employment of a transmitting dynamometer as a governor. In this way the governing action is made proportional to the rate of work. Professor Thompson's very simple device is to have resistance-coils so placed in the pulley of the transmitting dynamometer, which is fixed to the shaft, that as the rate of work varies, and the movable pulley of the dynamometer changes its position with reference to the fixed pulley, resistance will be added to or taken from the circuit; thus modifying the current, and bringing about the required government.

An interesting paper was also read by Professor Wead, in which he gave the results of some experiments made on the energy absorbed by organ-pipes in producing sound. Among other things, he showed that reeds are very much more efficient than pipes, giving far louder sound with less expenditure of energy. He also showed that the results of his experiments, on the energy absorbed by pipes of similar shape but different pitch, confirm the practical rule adopted by organ-builders in increasing the proportional diameter of the pipes as the pitch increases, so as to maintain equal loudness. Professor Wead finds, that for a rise in pitch of sixteen semitones, one-half the energy is required in order to give a scale of sensibly equal loudness.

Professor Loudon read a very interesting paper, giving simple geometrical constructions for determining the cardinal points of a thick lens or a system of thick lenses. It is to be hoped that he may publish his paper in full.

Many other papers were read of more or less interest, but those given are the most important.

NOTES AND NEWS.

IT may be well to call attention once more to the course of eighteen lectures by Sir William Thomson, on molecular dynamics, at the Johns Hopkins university in October. Professors and students of physics are invited to attend.

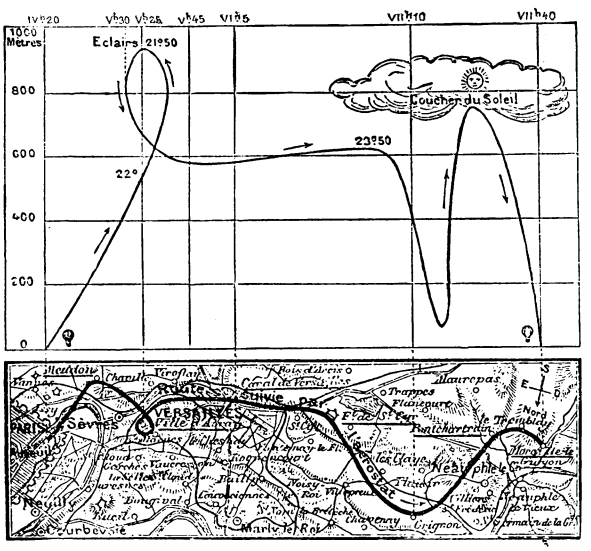
— The following persons were elected officers of the American association for the advancement of science for the ensuing year: President, H. A. Newton of New Haven, Conn.; permanent secretary, F. W. Putnam of Cambridge (office, Salem, Mass.); general secretary, Charles Sedgwick Minot of Boston, Mass.; assistant general secretary, Charles C. Abbott of Trenton, N.J.; treasurer, William Lilly of Mauch Chunk. Section A, mathematics and astronomy, J. M. Van Vleck of Middletown, Conn., vice-president; E. W. Hyde of Cincinnati, O., secretary. Section B, physics, C. F. Brackett of Princeton, N.J., vice-president; A. A. Michelson of Cleveland, O., secretary. Section C, chemistry, W. R. Nichols of Boston, Mass., vice-president; F. P. Dunnington, University of Virginia, Va., secretary. Section D, mechanical science, J. Burkitt Webb of Ithaca, N. Y., vice-president; C. J. H. Woodbury of Boston, secretary. Section E, geology and geography, Edward Orton of Columbus, O., vice-president; H. Carvill Lewis of Germantown, Penn., secretary. Section F, biology, Burt G. Wilder of Ithaca, N.Y., vice-president; M. C. Fernald of Orono, Me., secretary. Section G, histology and microscopy, S. H. Gage of Ithaca, N.Y., vice-president; W. H. Walmsley of Philadelphia, Penn., secretary. Section H, anthropology, W. H. Dall of Washington, D.C., vice-president; Erminnie A. Smith of Jersey City, N.J., secretary. Section I, economic science and statistics, Edward Atkinson of Boston, Mass., vice-president; J. W. Chickering of Washington, D.C., secretary.

— The next meeting of the British association will be held at Aberdeen.

— It was suggested by Capt. Bedford Pim, at Philadelphia, that the 1886 meeting of the American association should be held in London. It is understood that there is no constitutional obstacle in the way of the association meeting outside of America; and it

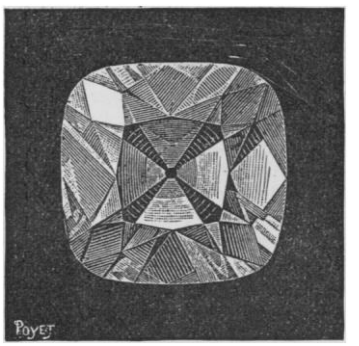
is possible that through the efforts of Capt. Bedford Pim an invitation may be received from the city of London.

— Dr. Dobell, in writing to the London *Times*, directs attention to a method of destroying cholera and typhoid germs, in drinking-water, by passing through it an electric current, and thereby exposing it to the influence of nascent oxygen, by which means the water would be dezymotized. This suggestion of Dr. Dobell's seems to have been forestalled by the construction of a filter invented by Dr. Stephen H. Emmons, which is now on view at the offices of the Economic electric company in London. The filter consists of an earthenware vessel, in which are placed porous cells containing carbon plates, the spaces between the plates and the cells being partially filled with animal charcoal. The plates are coupled up with the positive pole of a Leclanché battery or of one of the company's own chromozone batteries. Alternating with the porous cells are other carbon plates, which are coupled up with the negative pole of the battery. The water is supplied into the porous cells, and passes through the charcoal to the exterior of the cells, and is drawn off by a tap in the usual way. It is claimed, that by this means, the water being submitted to the influence of the evolved nascent oxygen, as suggested by Dr. Dobell, the *materies morbi* of typhoid, cholera, and similar diseases are destroyed, and that an end is put to the dreaded danger of, 'death in the pot.'



— The 7th of last August was signalized in France by three balloon ascensions. Gaston Tissandier and Georges Masson, the editor and publisher of *La nature*, made an ascent from Paris (a diagram of the course of which we reproduce from that journal), which occupied three hours and twenty minutes. While they were in the air, Shoste crossed for a second time the English channel; starting alone from Boulogne at 7 P. M., and descending at 9.50 P.M. at New Romney. In the evening, Hervé made an ascension at Paris in a balloon provided with some aëronautic apparatus constructed on a new system.

— Among the diamonds reserved from the approaching sale of the crown jewels of France is the Regent, so-called, which is retained on account of its mineralogical rarity, its perfect shape, its limpid



color, great size, and fame. According to *La nature*, from which we take the accompanying illustration representing its exact size, it is the largest brilliant known.

— In lecturing at the Health exhibition, on cholera and its prevention, Mr. de Chaumont expressed his opinion, that, "in regard to disinfectants, there is but one true disinfectant; viz., fire. The majority of so-called disinfectants are simply deodorants. The idea that tobacco-smoke or the odor of camphor is destructive of contagion is still extensively held, though it is simply absurd. A true disinfectant is a substance that will kill the germ or living particle in which the contagious principle resides, or through which it is conveyed."

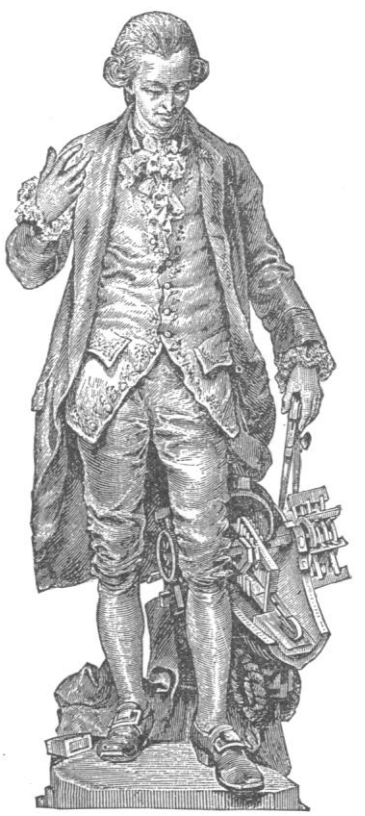
On the other hand, Mr. de Cyon, at a séance of the Académie des sciences on July 21, recommended as a prophylactic against cholera, boracic acid, or a solution of borax, to be applied to all the external mucous membranes, and about six grains of borax to be taken with the food and drink every twenty-four hours.

— At a meeting of the Association of public sanitary inspectors in London, on Aug. 11, Mr. Edwin Chadwick read a paper on preparations for meeting the cholera, giving his experiences of the action of the board of health in the visitation of 1848–49. It would be in accordance, he thought, with the previous advances of the disease in periodic bounds upon Europe, that it should sooner or later again visit England. The practice of quarantine he considered useless and mischievous. The last decade had shown a reduction of the sickness and death-rate by nearly three-quarters of a million, and a saving of some four millions of money, incontestably from the reduction of the foul-air diseases operated upon by the services of the sanitary inspectors.

— Among the celebrities at the Medical congress at Copenhagen were Virchow, Pasteur, Lister, Volkmann, Esmarch, Spencer Wells. Pasteur's address on the prophylactic inoculation for hydrophobia was the sensation of the congress. In professional circles there are still many sceptics, and Pasteur still hesitates to try his experiments on man. The French committee appointed by Mr. Falières are watching his experiments in Paris. Pasteur believes in the existence of special microbes of the disease, but has not discovered any as yet. Professor Andeli of Rome spoke on the causes of malaria: the primary cause he considered to be subterranean water, and the subsidence of the top soil. In conjunction with the necessary draining, he recommended as a remedy a careful use of arsenic, with the treatment with quinine. Professor Verneuil of Paris continued the subject on the same lines. At the third sitting, Sir William Gull spoke on the formation of an international institute for the study of diseases; and his resolution was passed, forming the following international committee for the purpose: for Germany, Ewald and Bernhard; France, Bouchard, Levine; Great Britain, William Gull, Humphrey, and Mac Cormac; with Professor Owen as general secretary. On the 15th, Professor Virchow spoke on 'Metaplasia;' and on the 16th the congress closed with Professor Panum's address on 'The food of healthy and unhealthy men.' The next congress will be held at Washington, in 1887. Professor Virchow's closing address was received with immense applause.

— On June 30, in Bremen, a technical commission met to discuss the export of German coal. The question whether a German coal-export company should be formed was answered in the affirmative; but a preliminary committee of inquiry was elected to report on the capabilities of foreign markets, to study their relative positions, and to make representations to the Prussian minister of railways as to tariff regulations and the improvement of loading and unloading arrangements at the harbors.

The August number of the *Kansas City review of science and industry* contains an enthusiastic article on meteorological discoveries, by Isaac P. Noyes of Washington, in which the weather-map is extolled as the basis of progress in meteorology. While many will agree with the writer, that the daily maps of the weather are of great value, it seems that he places too great importance on the 'highs' and 'lows,' as he terms barometric elevations and depressions in accordance with what may be styled signal-service slang; and that he gives too little credit to what was known before the advent of weather-maps. The following quotation illustrates Mr. Noyes's low opinion of earlier studies: "Until we had this wonderful weather-map, we had little or no conception of the meteorological phenomena of the world. For example, the tornado. The old 'physical geography' system had various names for this violent phenomenon, such as *cyclone*, *hurricane*, and *tornado*, and undertook to draw a line between them, giving certain characteristics to one which it did not give to the other. The map reveals the fact that they are all one and the same, and that they proceed from 'low'" (p. 202). But this opinion is certainly open to criticism; for if any fact is well proved by the weather-maps, it is that tornadoes are essentially different from cyclones, instead of being one and the same with them. A somewhat broader and more careful study of the old system, as well as of the newer weather-maps, might again suggest amendments to such assertions as these: "The violent windstorm we call tornado or cyclone when it occurs will always be in the track of 'low,' and generally at an acute angle thereto" (p. 202); "The cause of low barometer we ascribe to concentrated heat" (p. 198). The confusion of terms and error of statement in the first of these extracts, and the vagueness of explanation in the second, are especially unfortunate in an article seemingly intended for popular instruction.



— We reproduce from *Science et nature* a picture of the statue of the Marquis Claude de Jouffroy, executed by Charles Gautier, erected at Besançon, France, and inaugurated last month. De Jouffroy was the first to make a serious attempt to apply steam to navigation after Papin's experiments in 1707. De Jouffroy's first experiments were made on the Seine in 1775, and the Doubs in 1776, and afterwards more successfully on the Saône at Lyons in 1780.