

on each of the plates, and thus produce local action and the formation of lead sulphate. It would not be a difficult matter to effect such diffusion, and the experiment would be one of considerable interest.

NOTES AND NEWS.

THE annual meeting of the Society of German Men of Science and Physicians, according to *Nature*, will be held at Nürnberg from September 12 to 18. At the same time and place there will be a meeting of the German Mathematical Association. In connection with these meetings there will be a mathematical exhibition, including models, drawings, apparatus, and instruments used in teaching and in research in pure and applied mathematics. The project has the support of the Bavarian Government, and those who are organizing the exhibition have secured the co-operation of various competent men of science, and of the mathematical departments of some colleges, besides that of prominent publishers and well-known technical institutions. Space will be granted free of charge to exhibitors.

— Mr. E. H. Parker, the British consul at Kiungchow, in Hainan, a large island off the southern coast of China, mentions a curious phenomenon in connection with the tides of that port. The tides inside the inner harbor, as we learn from *Nature*, require several years of careful observation before they can be tabulated. It appears certain, however, that there are always two tidal waves a day, though one is so much more considerable than the other that the effect is often practically that of one single tide in the twenty-four hours. The easterly and westerly currents through the straits are not necessarily connected with the rise and fall of the water, either there or in port. The phenomenon of "slack water" (*morte eau*) is also observable every ten days or so at Haiphong, and is probably owing to much the same causes as at Hoihow. At Tourane in Tonquin, too, it is popularly thought that there is usually but one tide within the twenty-four hours. This tide is felt away up to the citadel of Quangnam. In the Gulf of Tonquin the incoming tidal wave flows from the south, a fact which perhaps accounts for the singular circumstance that the westerly current in the Hainan Straits always sets for sixteen hours. One at least of the tidal waves from the east, which pass Hoihow, cannot get through the straits to Tonquin so soon as that portion of the same wave which takes a circuitous course by way of Annam.

— A Report of the State Geologist of Missouri, dated June 3, shows that much attention has been given to the study of the zinc and lead deposits, and in this connection examinations have been made in Jasper, Newton, Lawrence, Greene, and St. Francois Counties. In addition, detailed mapping has been prosecuted in Jasper County, and about 140 square miles have been covered during the past month. Further, there has been collected in Jasper County a large number of charts showing the location of mining properties, shafts, and ore bodies; and a great amount of statistical matter relating to these. The material thus acquired will be used in the preparation of the general report upon the zinc and lead deposits and also in the special report which will accompany the maps of Jasper County, now in preparation. In connection with the examination of the iron-ores, stratigraphic studies of the Ozark region have been prosecuted along the Big Piny and Gasconade Rivers in Texas, Pulaski, Phelps, Maries, Osage, and Gasconade Counties. In addition, iron-ore deposits have been inspected in Ripley, Carter, Wayne, and Butler Counties. The clays of the State have been subjects of further examination in both the field and the laboratory, deposits having been visited in St. Louis, Jefferson, Washington, Madison, Bollinger, Carroll, Chariton, and Randolph Counties. The study of the Quaternary geology of the State has been prosecuted in Jackson, Lafayette, Johnson, Macon, Randolph, and Saline Counties. In Greene and Polk Counties a small amount of systematic geological mapping has been done. The excessive rains during the past month have not only made all the field-work difficult and disagreeable, but have made certain work impossible, and have materially retarded the progress in other directions. It is greatly to

the credit of the assistants of the survey that, notwithstanding the hardships endured and the difficulties overcome, such advance has been made. In the office the preparation of reports has been constantly in progress. This includes the original composition, the revision, and preparation for the printer, the correction of proof, the drawing of maps and illustrations. The reports which have thus specially received attention during the past month are: the report on the iron ores; the report on the mineral waters; the report on paleontology; the report on the Higginsville sheet; the reports on the Warrensburg, Iron Mountain, and Mine La Motte sheets; and the report on the crystalline rocks.

— At a meeting of the American Philosophical Society, Philadelphia, May 20, the following preambles and resolutions were read and considered: "Whereas, This Society did in the year 1843 celebrate the Centennial Anniversary of its foundation by a series of addresses, meetings, receptions, exercises, etc., upon the 25th, 26th, 27th, 28th, 29th, and 30th days of May, the results of which were published in a special volume of over two hundred pages; and, Whereas, We are approaching the Sesqui-Centennial Anniversary of the same auspicious event; therefore, be it Resolved, That the Society will celebrate the same in a worthy and becoming manner. Resolved, That the president be authorized to appoint a committee of five members to make all necessary arrangements for the same and with full power to act, and that the president be *ex-officio* a member of said committee." The preambles and resolutions, being considered by the society, were unanimously agreed to. The president subsequently appointed as said committee Messrs. Henry Phillips, Jun., chairman, J. Sergeant Price, Daniel G. Brinton, Richard Vaux, and William V. Keating.

— The usual monthly meeting of the Royal Meteorological Society was held on Wednesday evening, May 18. The following papers were read: (1) "Raindrops," by Mr. E. J. Lowe, F.R.S. The author has made over three hundred sketches of raindrops, and has gathered some interesting facts respecting their variation in size, form, and distribution. Sheets of slate in book-form, which could be instantly closed, were employed; these were ruled in inch squares, and after exposure the drops were copied on sheets of paper ruled like the slates. Some drops produce a wet circular spot; whilst others, falling with greater force, have splashes around the drops. The same-sized drop varies considerably in the amount of water it contains. The size of the drop ranges from an almost invisible point to that of at least two inches in diameter. Occasionally large drops fall that must be more or less hollow, as they fail to wet the whole surface inclosed within the drop. Besides the ordinary rain drops, the author exhibited diagrams, showing the drops produced by a mist floating along the ground, and also the manner in which snowflakes, on melting, wet the slates. (2) "Results of a Comparison of Richard's Anémo-Cinémographe with the Standard Beckley Anemograph at the Kew Observatory," by Mr. G. M. Whipple. This instrument is a windmill vane anemometer, and is formed by six small wings or vanes of aluminium, four inches in diameter, inclined at 45°, rivetted on very light steel arms, the diameter of which is so calculated that the vane should make exactly one turn for a meter of wind. Its running is always verified by means of a whirling frame fitted up in an experimental room where the air is absolutely calm, and, if necessary, a table of corrections is supplied. The recording part of the apparatus differs entirely from any other anemometer, and is called the Anémo-Cinémographe, and in principle is as follows: The pen, recording on a movable paper, is wound up at a constant rate by means of a conical pendulum acting as a train of wheel-links, whilst a second train, driven by the fan, is always tending to force it down to the lower edge of the paper; its position, therefore, is governed by the relative difference in the velocity of the two trains of wheel-work, being at zero when the air is calm, but at other times it records the rate of the fan in meters per second. The author has made a comparison of this instrument with the Standard Anemometer at the Kew Observatory, and finds that it gives exceedingly good results. (3) "Levels of the River Vaal at Kimberley, South Africa, with Remarks on the Rainfall of the Watershed," by Mr. W. B. Tripp. Measurements of the height of the River Vaal have for several

years past been made at the Kimberley Waterworks. These gaugings having been placed at the disposal of the Society, the author has compared them with the rainfall of the watershed. There is a marked period of floods and fluctuations at a comparatively high level from about the end of October to the latter part of April, and a period of quiescence, during which the river steadily falls with very slight fluctuations, from about Apr. 19 to Oct. 31. The highest flood, 525 feet, occurred in 1880, the next highest being 500 feet on Jan. 24, 1891.

— The admirable results which have attended the artesian borings in the Wed Rir, at Wargla, and more recently at El Golea in the Sahara, have led to a demand being made by the inhabitants of the Mزاب in the southern part of the French Sahara, for the assistance of the Government in undertaking experimental borings in that region also. M. G. Rolland, one of the few geologists who have explored the Algerian Sahara, and the only one who has visited the extreme south, makes the following observations, reported in the Proceedings of the Royal Geographical Society, on the régime of subterranean waters between Laghuat and El Golea. From the north to south in the region of the Laya, and on the chalk plateau which extends to the south, borings have no chance of success. In the shebka of the Mزاب and of Metlili, the conditions are only moderately favorable, and it would be necessary to penetrate down to 700, and even to 1,000, feet. To the south of the 32d parallel the chances of success increase in what M. Rolland calls the shebka of the south of El Hassi. Borings would undoubtedly succeed in the depressions of Dayet Tarfa, El Aref, Zubia, and Bu Fakrun. Further south, springing water would be obtained along the western border of the chalk reliefs, which is unfortunately complicated by the ramifications of the Western Erg, and the depths of the borings would go on decreasing until, on approaching the region of El Golea, it would be necessary to penetrate down only to 400 feet.

— The United States Consul-General at Seoul, in his last report, says that paper manufacture is one of the leading industries of Corea. This paper is highly esteemed, and always forms part of royal presents, and of the tribute paid to China. Besides its use for writing and for books, it is employed in a great diversity of ways. It serves as string, and in the manufacture of lanterns, fans, umbrellas, shoe soles, hats, boxes, and coats. It is also used for covering floors, walls, and ceilings, and, stretched on frames, supplies windows and doors. It is highly prized in China and Japan, and is especially sought after for the manufacture of umbrellas. It is made from the bush of the mulberry order (*Broussonetia papyrifera*), which is indigenous, growing in many parts of the kingdom, but thriving best in the moist, warm climate of the south. It is chiefly grown from cuttings for this especial purpose, and the wild and cultivated plants are said to be of equal value. The bark, which alone is used, is generally gathered in the spring, and it is boiled for a long time in water, in which a quantity of wood ashes has been mixed, until it becomes a pulp, the mass having been beaten during the whole time of the boiling. Fine bamboo screens are then placed in shallow wooden vats, and a ladleful of the pulp is evenly spread over the screen by a dexterous circular motion of the hand. This operation is repeated once or twice, or as often as may be necessary—the more frequent the operation, the finer the paper—and the screen allowed to drain into the vats, until a proper consistency is reached, the drippings being thus saved. They are placed on a hot kang floor to dry. After the drying has proceeded far enough, the paper is laid on a hot floor, and ironed by hand. The long lines in the paper show strands of the bamboo screens, and their nearness, distinctness, or absence indicate the fineness or otherwise of the paper. They are almost imperceptible in some grades of paper, while in others they are distinct and far apart. Paper is made by the Paper Guild, a numerous and prosperous association. The province of Chulla is the chief seat of manufacture.

— The statement is sometimes made, that, owing to the homogeneity of steel, a bar of this metal with a surface crack or nick in one of its edges is liable to fail by the gradual spreading of the nick, and thus break under a very much smaller load than a

sound bar. With iron it is contended this does not occur, as this metal has a fibrous structure. Even the late Sir William Siemens supported this theory, and likened a bar of steel to one of india-rubber, which, as everyone knows, is greatly weakened by a nick in one of its edges. Sir Benjamin Baker has, however, shown that this theory, at least so far as statical stress is concerned, is opposed to the facts, as he purposely made nicks in specimens of the mild steel used at the Forth Bridge, but found that the tensile strength of the whole was thus reduced by only about one ton per square inch of section. This settled the matter so far as statical stresses are concerned, and we now find in a recent number of *Engineering News*, an account of an experiment carried out by the Union Bridge Company, in which a full-sized steel counter-bar, with a screw-turned buckle connection, was tested under a heavy statical stress, and at the same time a weight weighing 1,040 pounds was allowed to drop on it from various heights. The bar was first broken by ordinary statical strain, and showed an ultimate breaking stress of 66,800 pounds per square inch, with an elongation of 29.17 per cent on 12 inches. The reduction of area at fracture was 52.4 per cent. The longer of the broken parts was then placed in the machine and put under the following loads, whilst a weight, as already mentioned, was dropped on it from various heights at a distance of five feet from the sleeve nut of the turn buckle as shown below:—

Stress in pounds per square inch...	50,000	55,000	60,000	63,000	65,000
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Height of fall.....	2 1	2 6	3 0	4 0	5 0
The weight was then shifted so as to fall directly on the sleeve nut, and the test proceeded as follows:—					
Stress on specimen in pounds per square inch.....	65,350	65,350	68,800		
	ft.	ft.	ft.		
Height of fall.....	3	6	6		

It will be seen that under this severe trial the bar actually carried more than when originally tested statically, showing that the nicking of the bar by screwing had not appreciably weakened its power of resisting shocks.

— The Councillor of Exploration of the Appalachian Mountain Club asks the assistance of members of the club during the coming season. Record of exploration in any part of the country will be welcome. In the White Mountains the whole region drained by the East Branch of the Pemigewasset needs exploration, especially in regard to the details of ravines, ridges, and minor summits; Mounts Thompson and Hastings have not yet been visited; and the region north and east of the Androscoggin has had but little attention except in the neighborhood of Gorham and Shelbourne. Members are requested to forward accounts of their visits to all places outside of the track of the ordinary tourists to A. L. Goodrich, Salem, Mass.

— The president of the Commission appointed to collect funds for the erection of a monument to the late G. A. Hirn, at Colmar, Alsace, are calling in the subscriptions, which are now nearly sufficient for the purpose. American subscribers should immediately send theirs to the nearest collector in this country. The sums subscribed abroad amount to from a few marks to several hundred, according to the ability of the subscribers. None is so poor but that he can add his mite. It is hoped that the opportunity to testify, in this country, the appreciation of America and of Americans, and their desire to honor the great genius of Alsace will be taken full advantage of. Contributions may be sent either directly to the president of the Commission, Mon. G. Kern, Colmar, or to either member of the committee in this country. The privilege of taking part in this movement is one not to be measured by money. Numerous small contributions are more desired by the management than a few large ones, and every friend and admirer of Hirn should send his mite.

— Since 1883, says the *Scottish Geographical Magazine*, the Dutch Government has been carrying out a triangulation of Western Sumatra, and at the end of 1890 the network had been extended over an area of more than 10,000 square miles, while some points had been determined in the northern part of the Padang lowlands and the south of Tapanuli. The base-line extends from Gunung Gadut to Pulau Satu, and is about 112,504 feet, but owing to a probable error of more than 3½ feet, it must be measured again.