deductions from monstrous assumptions, affectations of impossible learning mingled with a mass of mere jargon, calculated to sound like science to the vulgar. The whole makes such a farrago as might of itself send its writer to the lunatic-asylum, in which he would certainly prove a distinguished ornament — that is, if he is honest in his madness. Still, those who are minded to find 'sermons in stones, and good in every thing,' may get useful matter for reflection from it.

First, he may learn that the palmist art of divination is one of the oldest and most widespread, as well as the longest to survive, of superstitions. It is perhaps natural that men should try to make some interpretations of the curiously varied lines of the human hand. It would be easy for a primitive people to frame a fancy that the likeness, and at the same time the variety, of the lines in the hands of men, had something akin to the like and the unlike elements of all men's lives. It was, perhaps, from the ever-present longing for light on the great mystery, that some one of old hit on the conjecture that these lines that toil gives to the hand were prophecies of the life that the mortal was to lead. There at once sprang up systems of interpretation less apparently scientific than those of the astrologers, yet quite as credible, and winning as much credence in the olden time as did the predictions of the star science. There was a great mass of superstition of this same general nature afloat among all early peoples. Astrology, from the largeness of its claims, and the dignity of its pretended subject-matter, the action of the stars, has always held the first place in the hierarchy of humbugs. Next comes the interpretation of dreams, then divinations by signs, then palmistry, and at last a variety of less determined means of divination, — the flight of birds, the aspect of their entrails, etc. Where these notions have taken any strong hold upon the people, they have certain common features that show them, one and all, to be the bastard brothers of true science. They all rest upon that idea of likeness in nature which precedes the understanding of cause and effect. Man is always ready to find the unexplored clouds of nature 'very like a whale,' or 'backed like a camel,' at the bidding of any one who will affect superior discernment, and promise him to rend the future's veil. The more remote the likeness, the more undisciplined men will strain to note it, and, noting, the more implicit their belief in it.

Such books as this mark the remains of the old truth-searching impulse, which, in its first active shape, gave us superstitions, but which, finally united with a critical spirit, gave us true learning. They indicate a stronger survival of the old spirit of superstition than is commonly supposed to continue in educated communities.

Divination has a higher place in the common mind than most well-trained men are disposed to believe: even in our best educated communities, it is still, as of old, a well-paid profession. In the leading paper of Cambridge, Mass., published within a stone's throw of the university, a professed divinator has kept for years a large business-like and soberly worded advertisement of his services. The circulation of this paper is not among the lower classes: on the contrary, its principal *clientèle* is among the more intelligent people. The present writer is informed that a good many speculators base their 'futures' on the predictions they obtain from these wizards. We have managed to varnish our American people with an appearance of modernism; but our school system, with its imperfect scientific training, makes no efficient battle against these pernicious relics of the past. It leaves the child without that sense of natural law which alone can overthrow such superstitions.

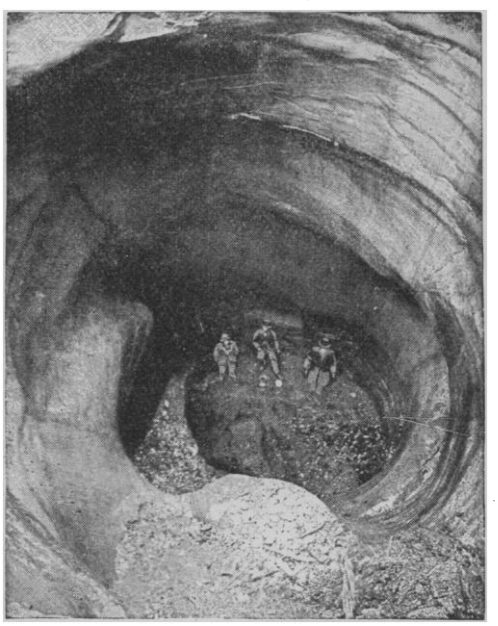
We cannot dismiss these indications of a low state of mind with the grin with which one is disposed to treat them. That a considerable part of our people still believe in witchcraft is indeed a serious matter. The machinery of our modern society rests on the theory that men are guided by a common sense of cause and effect. In any serious turn of affairs, when action must rest on the general rationality of the people, those who support these wizards will prove unfit for trust. Our system of education should be shaped to meet this evil. Children should be forced to see that they live under a reign of law: to leave them longer, with nothing to check this strong inherent tendency to base superstition, is to leave rotten timber in the ship of state.

NOTES AND NEWS.

THE 'cold-wave flag,' whose use has been inaugurated by the signal-service during the past autumn, is intended to be displayed not only at the regular stations of the signal-service, but also at as many railway-stations and post-offices as possible, in order to spread the widest notice of the coming change of weather. The service cannot at present undertake to provide the flags or to pay for special telegrams to numerous local display-stations; but the cost of the flags (white, six feet square, with a two-foot black square in centre) is moderate, and can easily be borne

by those interested in securing early indications of falling temperature; and in several parts of the country the telegrams are sent to all the stations on certain railroads that co-operate with the signal-service, and thus promptly distribute weather-forecasts to the towns along their routes. It is probable that the coming year will see a considerable extension of this kind of weather-service.

— The report on the terminal moraine in Pennsylvania, by Prof. H. Carvill Lewis, published by the geological survey of that state, gives the detailed observations on which was based the *résumé* that has already appeared in *Science* (ii. 163). The volume opens with a characteristic preface by Professor Lesley; and the description of the moraine along its irregular course follows in nearly three hundred pages, with numerous sketch maps and artotypes. The latter illustrate types of landscape having a strikingly glacial form, especially well shown in the morainic deposits of Cherry valley, Monroe county (pl. x., xi.); and include a remarkably fine view of a scratched bowlder (pl. v.). Students of glaciology are already familiar with observations showing the small regard paid by the ice-sheet to hills and ridges in its path. The effects of a similar indifference to local topography are seen in the direct course of the moraine across valleys; for the opinion that separate glaciers ran down each river-valley like a series of tongues projecting beyond the margin of the united glacial sheet is not sustained by Professor Lewis's investigations. The same report contains a note by Professor Lesley describing a remarkable monument — if a hole can be so called — of glacial action. This is a pot-hole found last winter by the men at work in the Ridge (coal) mines of Messrs. Jones, Simpson, & Co., Archibald, Luzerne county, Penn. It is twenty feet in diameter and forty feet deep, and when found was full of round stones, gravel, and fine sand; on removing this, the walls of the natural air-shaft were disclosed, showing the sandstone cut through clean and smooth, down and into the underlying coal-bed. The adjoining coal was found in perfect condition. Flanges of rock rise spirally from the lower part of the cavity toward the surface. The cut here given is taken from a photograph by Mr. Henry Frey of Scranton, Penn., who has also published larger views, looking out of as well as into the hole. A second pot-hole is also reported, two miles from the above locality, near Messrs. Winton & Dolph's mines.



POT-HOLE FOUND IN A PENNSYLVANIA COAL-MINE.

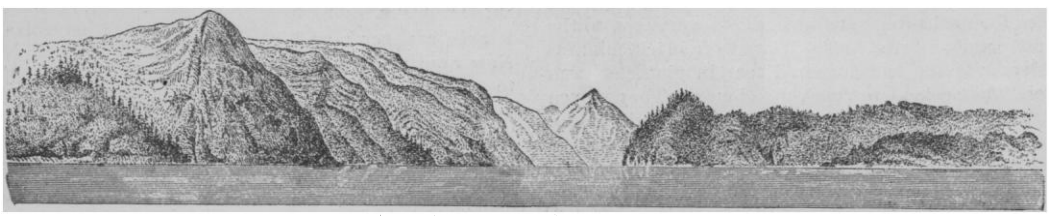
In the October number of the *American journal of science*, Mr. Lewis discusses the validity of observations on supposed glacial action at eleven points in Pennsylvania south of the terminal moraine, all of which he has visited. He concludes that they are all non-glacial, some being simple water-worn gravels, others being ice-rafted bowlders, while the scratches reported in two localities are pronounced slickensides and plant-fossils. The glacial action reported in Virginia needs similar re-examination.

— Capt. H. W. Chetwynd, R.N., chief inspector of lifeboats in Great Britain, having been directed to test the use of oil in calming troubled waters, reports that his experiments show that there is little difference in the effect produced by the various oils of every-day use; very small quantities of either colza, linseed, fish, seal, or paraffine oil being found sufficient to cover a considerable space with the smooth glassy surface characteristic of oil on water. The effect of this oily film was most marked on moderate breakers, as it entirely stopped their breaking, and left only a gentle swell; but, on surf such as might endanger the safety of a lifeboat, the oil had but little and often no calming effect. On several occasions, when a larger breaker than usual rose in a moderate surf which the oil had 'killed,' the oil was powerless to check it; and the sea broke through it, covering the boat, gear, etc., with oil. It failed, also, to have an effect on breakers caused by a heavy ground-swell. To be any protection, oil must be applied to the sea from the boat or vessel in the direct line from which the seas are advancing, and at a sufficient distance to give it time to spread and act upon the waves before they reach the vessel. This could be done in a lifeboat only in two positions: 1. When anchored, and lying head to sea and tide; 2. When running dead before the sea for the shore. In any other position, even supposing the oil to be calming the water, it would probably be impossible to keep the boat within its influence, and proceed towards a wreck or other desired point, at the same time. Under these circumstances, Capt. Chetwynd is of the opinion that no practical advantages can arise from the use of oil by the lifeboats of his institution, and he cannot recommend its being issued to them. He states,

however, that these experiments clearly demonstrate that in many cases it would prove a material protection to ordinary open boats in a dangerous surf, and he strongly urges its adoption for use in such cases.

— Capt. Klein of the German bark Kron Prinz von Preussen, making passage from Rio de Janeiro to Baltimore, reports encountering on Nov. 30 and Dec. 1 a very strong current from south-east one-eighth south, which he estimated at 3.2 knots per hour. The wind was blowing a whole gale from the north-east and north, and his vessel was hove to for twenty-four hours. His position at noon on Nov. 30 was, latitude 34° 29′ north, longitude 74° 22′ west; and on Dec. 1, latitude 36° 5′ north, longitude 73° 20′ west. The captain, being unable to account for this unusual current, took six observations between noon of Nov. 30 and noon of Dec. 1 to verify the fact.

— The earlier editions of the Coast pilot of Alaska, prepared by Davidson, and published by the Coast-



KASA-AN BAY, CAPE GRINDALL, E. ¾ N. 12 MILES. (*From U.S. Hydr. Office, Chart No. 225.*)

survey in 1867 and 1869, are now succeeded by a new work, exhaustive of all known sources of information, compiled by Mr. W. H. Dall, assisted by Mr. Marcus Baker. This is entitled 'Pacific coast pilot, Alaska, part i.,' and gives sailing-directions, with charts and views, for the inland passage from the north end of Vancouver's Island to Dixon's entrance, and thence along the coast of our distant possessions to Yakutat Bay, where the shore-line turns westward. Much additional surveying is needed to attain final accuracy, as the coast is fringed with many islands, and is greatly broken by long, irregular fiords. In the northern part especially, it is bold and mountainous, and numerous glaciers descend close to water-level. The accompanying figure gives a view of Kasa-an Bay, and recalls the abruptness of the Norwegian coast.

— *Nature* states that Prof. G. H. Darwin of Cambridge, and Professor Daniel Oliver of the Royal gardens, Kew, have been nominated by the council of the Royal society for the award of the two royal medals conferred by the crown. The Copley medal is to be given to Professor Carl Ludwig of Leipzig, in recognition of the great services which he has rendered to physiological science; Professor Tobias Robertus Thalén of Upsala is to have the Rumford medal for his spectroscopic researches; and the Davy medal is awarded to Prof. A. W. H. Kolbe, also of Leipzig, for his researches in the isomerism of alcohols. The two Leipzig professors are foreign members of the society. Professor Darwin and Professor Oliver are fellows, — the former well known for his mathematical investigations on the rigidity of the earth and on tides; the latter, for his investigation of the classification of plants, and for the important services which he has rendered to taxonomic botany.

— The work of establishing secondary meridians of longitude on the west coast of Central and South America by means of the submarine cable, which was undertaken by Lieut.-Commander C. H. Davis, U.S.N., has been completed. Stations were established at various points between La Libertad, San Salvador, and Valparaiso; and the differences of longitude between Valparaiso, Arica, Lima, Payta, Panama, and La Libertad, were determined. The measurements between La Libertad and Guatemala were made in co-operation with Mr. Miles Rock of the Guatemala survey. From Valparaiso, signals were exchanged with Dr. Gould at Cordova for the purpose of connecting the measurements made on the west coast with those made on the east coast of South America in 1878 and 1879. The observations are now being reduced, and prepared for publication.

— The bureau of navigation of the Navy department announces that the computations and discussions of the observations and experiments for determining the velocity of light have been completed, and are being prepared for publication.

— The Navy department reports that the 'electric plant' for incandescent lighting, which was supplied to the U. S. S. Trenton, has given great satisfaction, notwithstanding some defects in the insulation of the wires, and has added materially to the comfort and health of the officers and crew, and therefore the Atlanta, Boston, and Omaha are to be lighted by electricity. The plant for the Atlanta will be supplied by the U. S. electric-lighting company of New York; that for the Boston, by the Brush electric company of Cleveland; and that for the Omaha, by the Consolidated electric-light company of New York. The merits of the various systems may thus be determined.

— A group of beetles known as the Stenini has received attention at the hands of Lieut. Casey in a brochure of more than two hundred pages. It brings us another step toward the aggregation of the material for a more or less complete monograph of our Staphylinidae. The work has been carefully and conscientiously done from the author's stand-point, and but little adverse criticism can be made except in the

following particulars: there is an evident tendency to divide species upon small details of sculpture, fortunately checked, as the author admits, where the specimens are numerous; but the summary admits eighty-eight species in a hundred and seventy-two, founded on only one and two specimens, — an unparalleled percentage in any monographic work on Staphylinidae ever published. The descriptions are unnecessarily verbose and tiresome, and could have been abbreviated by half with advantage to both author and reader. The division of Stenus, in which the author believes himself to have taken the initiative, is unnecessary and untenable. The genus Areus of Casey has already been separated by Motschulsky (*Bull. Mosc.*, 1860, i. 556) under the name Hemistenus, but has found no followers.

— The American brigantine Senoruta was in latitude 35° 50′ north, longitude 74° 12′ west, at meridian, Nov. 16, and experienced the severe storm of that date. About two P.M., when it was blowing very hard from the north-east, five whirlwinds were seen to the southward and eastward. They were black columns of water about four hundred feet in diameter, and their tops seemed to reach the clouds. They moved with great velocity at right angles to the wind, and, after passing the vessel, disappeared to the northward and westward. Four went ahead of the vessel, and one astern, within a half-mile. The whirlwinds were moving at the rate of twenty-five or thirty miles an hour. The appearance of waterspouts in the midst of a gale, and moving at right angles to the wind, is quite unusual.

— The molluscan fauna of the Silurian period in Götland is illustrated in a fine quarto, with numerous plates by Prof. G. Lindström of Stockholm, published by the Swedish academy. It comprises the gastropods and pteropods, and is, perhaps, the first paper which treats at all fully of the Silurian members of these groups, and contains much of interest, both new and old. A Silurian genus of Chitons (Chelodes), a remarkable Patellid (Tryblidium), and a very large number of forms allied to the recent Pleurotomariae, are fully described. The presence of Subulites, and other siphonostomatous gastropods in Silurian times, is demonstrated, and some extremely singular new genera made known. The text is in English, and the whole work extremely creditable to its learned author, and useful to the paleontologist.

— An additional discovery by Dr. Lindström, in the same rocks, is worthy of special notice. In beds which are said to be the equivalent of our Niagara group, he has discovered a remarkably well-preserved scorpion, of which a photograph is before us. That it was air-breathing, though found in a purely marine deposit (into which it was probably washed), is proved by the fact that one of the stigmata is plainly visible. Dr. Thorell, one of the foremost students of Arachnida in the world, and Dr. Lindström, are preparing a paper upon it, and have given it the name of Palaeophoneus nuncius. No scorpions, nor indeed any Arachnida, have before been found fossil in beds lower than the carboniferous deposits, in which some twenty-five species have been found in this country and Europe; yet this Silurian example is more perfect than any specimen of a fossil scorpion from any formation. It presents some marked peculiarities, but it seems to be unquestionably a scorpion.

— In his 'Contributions to the tertiary geology and paleontology of the United States,' Prof. A. Heilprin has collected a series of six papers, mostly from the publications of the Philadelphia academy of sciences. Mr. Heilprin does not recognize the existence of any pliocene strata in the eastern and southern portions of the United States. A map which is added embraces only the tertiaries of the Atlantic and Gulf coast regions, and the lower Mississippi valley. This is the first time that a succinct statement of the tertiary geology of the eastern United States has been attempted; and Professor Heilprin has produced a work which will be valuable to those who may undertake the exhaustive study of the eastern tertiaries, which they so much need.

— In a paper read before the Linnean society of New South Wales, Oct. 29 last, Dr. Lendenfeld contests the views of the French physiologists, that the position and movements of the wings of insects are merely the results of the mechanical influence of the resisting air, and gives instances where muscular contraction had been clearly proved.

— The committee on organization of the Ninth international medical congress, to be held in the United States in 1887, met in Washington, D.C., on Nov. 29, 1884, for the determination of the general plan of the congress, the election of officers of the committee who will be nominated to fill the same offices in the congress, and the consideration of questions of finance. The officers elected are as follows: president, Dr. Austin Flint, sen., of New York; vice-presidents, Dr. Alfred Stillé of Philadelphia, Dr. Henry I. Bowditch of Boston, Dr. R. P. Howard of Montreal, Canada; secretary-general, Dr. J. S. Billings, U. S. army; treasurer, Dr. J. M. Browne, U. S. navy; members of the executive committee (in addition to the president, secretary-general, and treasurer), Dr. I. Minis Hays of Philadelphia, Dr. A. Jacobi of New York, Dr. Christopher Johnston of Baltimore, Dr. S. C. Busey of Washington. The executive committee will proceed at once to complete the work of organization.

— The next meeting of the Society of naturalists of the eastern United States will be held at Washington, D.C., on Monday and Tuesday, Dec. 29 and 30, 1884. By the courtesy of the Smithsonian institution, the society will have the use of the lecture-room of the institution for its meetings. The first session will be on Monday the 29th, at ten A.M. promptly. It is expected to have a discussion on the teaching of natural history in colleges.

— The San Diego society of natural history has received an addition to its herbarium of seven hundred species of southern and lower Californian plants. This series of plants will be known as the Orcutt herbarium.