

ON MINERAL VEINS.

We find in the proceedings of a late meeting of the London Geological Society, a discussion on mineral veins opened by W. Morgan.

He maintained that no one theory can be accepted in explanation of the formation of mineral veins, and that while in some cases their formation may be due to the presence of pre-existent fissures induced by shifting of the containing rock, in others any such explanation is insufficient, as he thought the means by which the sides of such fissures were kept apart could not be easily indicated. The point upon which he especially insisted in connection with this question was the presence of "horres" in many mineral veins. He advocated the view that the walls of veins were in close proximity in their earliest stage, and that the enlargement and infilling of the veins took place simultaneously, by the segregation of materials derived from the adjacent rock, supplemented, perhaps, by a tension, or tendency to separation, caused by slow contraction of the latter. Instead of a fissure being assumed the presence of an irregular surface of least resistance, or of electrical action, at which the vein matter might collect at first as a mere film. In this way, he thought, the vein might increase, and its walls might recede, simply by the aggregation of the vein matter itself, and in general proportion to the degree of mineral saturation of the adjacent rocks.

Professor Harnay said he was startled, but not terrified, by this new view of the formation of mineral veins, and especially by the implied suggestion that the rocks on either side of a mineral vein were in a less consolidated state when the vein was formed than at the present time; but at the same time, considering that so many veins are to be found in deposits, which had not only been consolidated, but had already undergone metamorphism, producing slaty cleavage (as, indeed, had been mentioned by the author), before the formation of the veins contained in them, he could not altogether accept the new notion. He remarked that joints in rocks, especially limestones, are always permeable by water, and by this means fissure joints may be easily widened. Hematite, as is well known, lies in great water-worn fissures and caverns in the carboniferous limestone of south Lancashire; but with slaty rock he thought the case may be very different. He referred to the arrangement of mineral veins in support of the view that their depositing took place in open fissures; and, considering the solidity of the rocks before the formation of mineral veins, it seemed to him difficult to imagine how these immense masses could be pushed aside, as they must be, by the formation of small veins in the manner suggested by the author.

Professor Hughes mentioned cases in which protuberances had held rock faces apart during movements, as, e. g. on a small scale, where worn tracks on the face of a Cambrian rock had given rise to a kind of crack and fall during movements producing slickensides along the bed on which they occurred. On a large scale, as, e. g. in the Via Mala in the Alps, vast fissures might be seen running down the side of the precipice; and obviously, when displacement took place along such cracks, the two sides could not be in contact along their whole length, until the protuberances had all been ground down, forming what he called "fault brooms."

He thought the manner of occurrence and alterations of various minerals showed that they had been formed by crystallization along successive layers on each wall of the fissure, the growth of the crystal being outwards from the walls, and each new layer having the impress of that on which it was thrown down.

LEVERIER ON ULTRA-NEPTUNIAN PLANETS.—After a long continued labor Leverier has at length, with the theory of Neptune and Uranus completed the study of all the members of the solar system. His chief object was to decide the question whether there is an ultra-Neptunian planet, which might be detected, as Neptune was, by the perturbations produced by it on planets already known. The conclusion is negative; there is nothing indicating the existence of a body outside of Neptune. Now that there is nothing to be hoped for in the way of discovery at the outer boundaries of the solar system, we presume Leverier will devote himself to finding the intra-Mercurial planet or planets, in whose existence he still has unshaken belief.

AN ATMOSPHERIC LOCOMOTIVE ENGINE.—An atmospheric locomotive engine, designed by Major Beaman, Royal Engineers, has been on trial at Woolwich arsenal for some time past, and appears likely to be attended with success. The apparatus consists of a large number of elongated cylinders—about 70 in all—piled together in an oblong stack, each cylinder being some four inches in diameter and about six feet in length. Mounted on an ordinary track, and by the ordinary crank arrangement, the compressed air stored in the cylinders has been found to exercise power sufficient to draw a light load for a considerable distance, and to keep up speed for a long time before requiring to be replenished.

THE LIEBIG MONUMENT.—The sum of 140,000 marks (about \$35,000) having been collected for the Liebig memorial, the committee has decided to erect the monument on a site of the projected monument has arisen between the rival committees of Giessemann and Munich, the former claiming the status on the ground that from their university Liebig's fame first issued to the world; the latter because their city was subsequently the scene of his labors. It has been resolved that both towns shall have a similar memorial, and that sufficient to cover the expense of both.

ELECTRIC CHAINS IN PARIS.—For making the four electric timekeepers which the city of Paris intends to erect, 14 names have already been entered. The competition will close on September 30th, 1877. The four clocks finally selected will be bought by the city of Paris at \$250 each. Three prizes, \$125, \$50, and \$40, will be allowed respectively in addition to the three best clocks.

WOMEN AND THE PRESIDENTIAL QUESTION.

"Out of woman's sphere," is it? Look at the piles of newspapers on our sitting-room tables for family reading. Their columns are filled with exciting political correspondence; reports of investigating committees; and a perfect avalanche of prophecy, explanation, threats and counter threats, that have made their way, unopposed and unhesitating, into the sacred precincts of woman's sphere.

The "gods" must be preparing for an unusually destructive foray, for the great mass of the body politic seem to have been "made mad"—so mad that only wooden women could possibly remain indifferent to the political involvements of our Presidential election. Indeed, why should we be less alive to the political struggles of 1876 than to those of 1876, which are held up to us as legitimate cause for womanly pride and rejoicing?

Democratizing is it? If government is of God, it is man's fault if in the exercise of its functions they are not brought into closer sympathy with Him and ennobled! If only God had put man at enmity with the serpent as He did woman, it might have been good for the world that he should be alone in its government. Possibly as woman had proved her power to win man to evil, God thought by putting her at enmity with the author of evil she might be trusted to win him to the good which she had learned at so great cost, not calculating that man would discard her as his helper; or foreseeing that if he did so, his necessities and her persistence would eventually re-instate her co-possessor and co-sovereign with him over all the earth. Who can say? That women have an irrepressible inclination to catch hold of the "reform" indigest somewhere and give it a lift is in evidence. Even the black women of the south, as we learn from Congressional investigations, have been practicing the intimidation policy on their Democratic husbands to control the presidential vote. The *modus operandi* is not stated, only that the men "were afraid of their wives." Being in the direct line of descent from old Adam, these black voters may be excused for dodging behind their wives. But it reminded me of a negative vote cast in Vermont in 1852 by a farmer's wife. She paired off with her husband by putting a collar round between them. After coaxing him in vain to cast a "no license" vote, as her representative, she got him down cellar after potatoes for "an early dinner," and seating herself on the trapdoor kept him there till too late for a six-mile ride to his voting precinct. Contrary to the predictions of peace-loving men—in case of a "divided vote" of married parties—there was no trouble in that family. Being a good Democrat and having had time to "master the situation," he told her a good joke, "show me who's at the temp'rance racket."—Mrs. C. F. H. Nichols.

STEEL EXPERIMENTS IN RUSSIA.

An English paper says that it is proverbial in Sheffield, and other centers of steel production and manipulation, that much remains to be learned in relation to that material. There are, in fact, phenomena and peculiarities observable about it, while in process of conversion and refinement, which baffle the judgment of the most practiced operators to understand. The same results by no means follow the same modes of treating steel in its gestatory stages; and the constant is frequently that they can not guarantee to supply, in continuity, steel of uniform grain and texture. In the midst of this uncertainty a Russian experimenter on steel, Mr. Chernoff, has published lately, at St. Petersburg, a pamphlet on the whole subject. The author states that "if steel melted in a crucible is constantly kept in violent agitation while cooling—agitation violent enough to keep all its particles in motion—then the cold ingot produced will have a very finely crystallized structure; if, on the other hand, the steel is allowed to cool in perfect quiet, then the resulting casting will consist of large, well-developed crystals. The appearance of these crystals, and generally the tendency to crystallize under such circumstances, will depend on the purity of the steel." Starting from this remarkable, but apparently well established base, Mr. Chernoff concludes that liquid steel really obeys the laws which regulate the crystallization of fluids. It is probable that chemists, at least, will agree to the truth of this deduction, for they know that if they wish to obtain crystals from a solution, the latter must be kept in perfect quiet. The author of the pamphlet asserts, too, that in the course of his long-continued experiments he has discovered that steel, when heated above a certain temperature, as to a dark cherry red, loses its crystalline structure and becomes amorphous. If, again, from this point it is allowed to cool undisturbed, it will become once more crystalline, unless it be hammered during the evolution of heat from it, when its fracture will exhibit its amorphous tendencies once more, and present a fine silky texture.

ELECTRIC LIGHTING.—*Douglas's Journal* says that a new electro-magnetic lighting instrument has recently been described by M. Hess. It consists of a chromic acid element, a small induction coil, and a vessel containing a mixture of alcohol and sulphuric ether. The pressure of a knob puts the zinc of the element in contact with the liquid, and the small induction sparks which are instantly the cause of a flame, are created from a sponge, which has been dipped in the mixture of alcohol and ether. According to the inventor, this instrument has the advantage of lasting a long time without requiring any attention.

A POSSIBLE NEW METAL.—Prof. G. A. Koenig, of the University of Pennsylvania, announces that he has reason to suspect the existence of a new metallic element in a mineral resembling schorlomite, occurring at Magnet Cove, Arkansas. In an examination of this mineral, he obtained, instead of titanite acid, a white oxide which differed very decidedly from the former. He is disposed to regard this circumstance as pointing most probably to the existence of a new metal in the mineral in question.

ON DRAFT.

Almost any person, after a judicious perusal of the following article, can by standing in any of our public thoroughfares for a few minutes convince himself of its truth. With the harness commonly in use it is by mere accident that the draft is in its proper place. If the draft is too high the collar rises and presses against the wind-pipe below and against the prominent dorsal vertebrae in front of the shoulder, the neck being raised curves the vertebrae of the neck, making it hollow, which detracts very much from the power, because it detracts from the draft so that the whole vertebrae are kept free from using his front feet as he would do, but on the contrary, forces undue bearing on the hind. High draft is the parent of the numerous defects in the hind feet and legs. When the draft is too low we have an opposite result, the top of the collar leans forward and presses against the crest of the neck, forcing the head down and raising the lumbar vertebrae, or back over the loins, thus throwing all the burden on the front feet, the most prolific source of producing serious disease in these animals. Hence the draft so that the whole vertebrae are kept free from unnatural curves, strains or twists, and you enable the horse to use his whole strength without injury to himself, in speed or otherwise. Were the draft properly adjusted, we should not see so many horses hobbling and awaying along in pain, unable to bear up under the task, which should be easy, and a constant object of pity to those intelligent enough to detect the cause.

The rim of the collar should follow as close as possible the form of the neck, and should not be pleated, but firm, so as to retain its proper shape under the strain of heavy draft. With a loose fitting collar, with the draft attached to the outside of the harness, over the outside point of the shoulder, concentrating the labor upon that point, is something like a man attempting to lift a great weight with a slender pole on the point of his shoulder. Cab and coach horses suffer the most, as they draw the heaviest burdens at the most rapid rates and their harness are the least adapted to steadiness in their work, and are consequently the prolific cause of interfering, etc.

Those who understand the formation of a horse will readily see the point aimed at in these remarks, which is first, to economize his strength, secondly, to save his feet and legs as much as possible from all the evils domestication makes him heir to, and thirdly, to prevent his structure from being malformed, as we so often see him, through being improperly harnessed. The structure of the horse is just as susceptible of change as is the human form. The shoemaker turns in a man's toes and knees, while the tailor turns his out, and so on among the crafts, from the fashionable to the rustic. As all the parts bear a certain proportion and degree of harmony to each other, the back bone and other cervicals should act in perfect unison and ease, the safer and more powerful are the horse's actions; but with a wiggling, twisting, swaying motion, the consequences of irregular attachment, he is sure to strike his fetlock or knees at some time or other on rough surfaces, such as cobble stones, etc. In order to prevent this the draft should be on the inside of the harness, which would give increased power and steadiness to the horse.—*Rural Press.*

NEW AERIAL MACHINE.—Experiments were made recently at Chatham, on the Great Lines, with an invention of Captain M. T. Sale, R. E., who is Secretary of the Royal Engineer Committee. The invention is a new aerial machine, to be used for discovering the position, etc., of an enemy's camp at night. The machine consists of a light framework covered with loose canvases, which becomes filled with air, and thus the machine is kept aloft. When at a proper height a parachute provided with fire-balls is sent up the line holding the machine; and, on reaching the machine, the parachute explodes, and the fire-balls are discharged, and thus the surrounding country is lighted up for a considerable distance, and the position of an army would be shown. The trials proved very satisfactory, in spite of the bad weather which prevailed; and further experiments will be made under more favorable circumstances. The trials were made in the presence of Major Maquay, instructor in field fortifications, and many other engineer officers.

LOAD FOR A MAN.—A curious set of experiments made in France developed some interesting facts in regard to the greatest average load for a man of good strength to carry a short distance. This was found to be 219 pounds; all a man can carry habitually, as for example, a soldier his knapsack, walking on level ground, is 122 pounds, (an extreme load it would seem), or he can carry an aggregate of 1,518 pounds over 3,200 feet as a day's work, under like circumstances. If he ascended ladders or stairs, as he did carriers, then he can carry but 121 pounds continuously, and his day's work cannot exceed 1,232 pounds raised 3,300 feet high. With regard to the effort and the velocity with which a man can produce by pulling or pushing with his arms, it has been found by these experiments that, under the most favorable circumstances, and for continuous work, an effect cannot be gained exceeding from 26.4 to 33 pounds raised from 1.5 to 2 feet per second, or about one-eighth-horse power.

FLUID COMPRESSED STEEL.—The *Polytechnic Review* notes that, speaking of the Iron and Steel Institute on the application of the hydraulic power in forging, Sir Joseph Whitworth stated that his firm had recently completed two cast-steel shafts for the *Argyle*, 283 feet in length, 17 inches in diameter, and cast with a nine-inch hole through them. These shafts were made of compressed steel and weighed 63 tons, instead of 97 tons, if made of iron—a reduction permitted by the great strength of the compressed steel. He further stated that on applying the hydraulic pressure, a column of metal is reduced one-eighth in less than five minutes—a remarkable indication of the effect of pressure in expelling air-cells. The strength of the shaft was 40 tons to the square inch, and its ductility or power of extension was 30% of its length. By using compressed steel, the driving round of 34 tons was saved during the whole life of the engine.

BOTS.

Prof. C. V. Riley gives the following essay on bots, those grievous pests of the stock grower: Almost all cloven-footed animals, and many other herbivorous species, are infested with bots. These are legless grubs which fall into three categories: 1. Gastric, or those which are swallowed by the animal infested, and which live in the stomach in a bath of chyle. 2. Cervical, or those which crawl up the nostrils and inhabit the frontal sinuses. 3. Cutaneous, or those which dwell in tumors just beneath the skin. They are all the larvae or early state of two-winged flies (diptera) belonging to the family *ostridae*, characterized by having the mouth parts entirely obsolete, and popularly called gad flies or bot flies. In the first series, of which the horse bot (*Gastrophilus equi*) is the most familiar example, the eggs are attached by the female fly to the hairs of the body, and principally on those parts of the body which may reach of the animal's mouth. The egg opens with a lid, and the young maggot upon hatching clings to the tongue as the animal licks itself, and is thus carried into the fore-stomach, to which it holds tenaciously by a series of spines around the body, but principally by a pair of sharp hooks at the head.

When fully grown, they leave their posts with the faeces, burrow in the ground, and undergo the final transformation. In the second kind, of which the sheep bot (*Oestrus ovis*) will serve as an example, the egg generally hatches within the body of the parent, and the young grub is deposited alive on the slimy nostrils of its victim. By means of a pair of long and sharp hooks at the head, and bands of minute spines on the venter, the young grub works its way into the sinuses of the head, and when full grown permits itself to be sneezed out, when it also burrows in the ground and transforms. In the third kind, the parent lays the eggs on those parts of the body which cannot be reached by the mouth of the animal attacked, and the young grub, which soon hatches, burrows into the flesh and subsists upon the pus and diseased matter which results from the wound inflicted and the irritation constantly kept up. The well-known worm, or ox bot (*Hypoderma bovis*) so common along the backs of cattle, and especially of yearlings and two-year-olds, and dreaded as much by the tanner as by the animal it infests, is typical of this kind. Residing in a fixed spot, we no longer find in this species the strong hooks at the head, and the spines around the body are sparse and very minute; the parts of the mouth are soft and fleshy.

All these bot larvae breathe principally through two spiracles placed at the blunt and squarely checked end of the body, and in the ox bot these are very large and completely fill up the hole to the tumor in which the animal dwells. When ready to transform, it backs out of its residence, drops, and burrows into the ground, and there, like the other species, contracts and undergoes its final change to the fly. The eggs of this ox bot are elliptical-ovoid, slightly compressed, and have at the attached end a five-ribbed cap or stout stalk with which it strongly attaches themselves to the skin of the back.

The gastric bots are best prevented by proper grooming of the horses to remove the eggs or nits from the fore legs and flanks. Horses, too, that are properly stable and kept in the shade during the hotter summer months are less frequented by the parent fly. Scarcely any mode of dragging will dislodge the bots when once they are attached to the stomach, without injuring the paritized animal. Cervical bots are also with difficulty dislodged except when they are full-grown and ready to naturally let go their hold. Animals may, however, be measurably protected, by enabling them to smear their noses with tar, or by enabling them to bury their noses when the parent fly is seeking to deposit. This they will instinctively do if portions of their pastures be turned up and the ground kept loose. The cutaneous species may be removed by pressure of the thumb and finger, or destroyed by the application of kerosene. If removed while small, the wound in the skin heals up, and no hole will occur in the hide.

LISTENING TO EVIL REPORTS.—The longer I live the more I feel the importance of adhering to the rule which I have laid down for myself in relation to such matters: 1. To hear as little as possible whatever is to the prejudice of others. 2. To believe nothing of the kind till I am absolutely forced to it. 3. Never to drink into the spirit of one who circulates an evil report. 4. Always to moderate, as far as I can, the kindness which is expressed towards others. 5. Always to believe that, if the other side were heard, a very different account would be given of the matter.—*Grove's Life of Simon.*

SIR LOUIS.—A very pretty story is told of the origin of the word "Sirloin," but we fear it is only a story. However, here it is: Charles the Second, of England, is said to have knighted the loin of beef, on one occasion, after his return from a long chase. Beholding a huge loin steaming on the table, he exclaimed: "A noble joint! By St. George, it shall have a title!" And raising his sword above it, he said: "Loins, we dub thee knight; henceforth be Sir Loins!" Though not an unreasonable tale, it is scarcely probable that it ever took place as related. The word is most likely a corruption of sirloin, which means the upper part of the loin.

PAIN.—"Pain is an ache, or abnormal feeling, produced from an unnatural condition of the nerve or nerves afflicted, and in most cases it is induced by pressure, derangement, disintegration, or the imperfect circulation of the blood in or near them. Proof of the first and last; Rubbing over and near the sensitive nerves by increasing the circulation mechanically, will remove the annoyance.

SUNDAY TRAINS IN CANADA.—Railway trains are not to be permitted for the future to run on Sundays in Canada. The Dominion government has issued orders that no trains are to be run on Sundays, excepting in cases of great emergency. Of this emergency the authorities are to be the judge, no Sunday train being permitted except on direct government order.