

SOME NEW MINERALS.

We gain from the Polytechnic Review some notes on new minerals described by European authorities: Uranocircite, phosphate of baryta and uranium resembling autunite, for which it was long mistaken, occurs in quartz veins in the granite of Falkenberg, Saxony-Vogtland. Sphero-cobaltite, occurs in spheroidal forms with roselite at Schneeberg, Saxony, structure coarsely radiated, rhombohedral, in microscopic crystals. Color, peach-red; H=4; sp. gr. 4.92-4.13; lustrous, ignition in closed tubes. Dissolves in warm hydrochloric acid with effervescence, compactive carbonate of cobalt.

Smukit is a new sulphate of manganese. This mineral is amorphous, forms staurolitic aggregates having an uneven fracture. H=1-2; G=3.15. Color, a dirty white and a reddish white where newly fractured. If a new surface be exposed for several days to a moist atmosphere, it is turned to an intense red, and an increase in weight is noticeable. Two analyses made of this mineral, the one by Albrecht Schramm and the other by Dietrich determine the formula as being Mn. So 4 H 20. This mineral was found in notable quantity in an abandoned mine in Felobanya. It is named in honor of Smukit, the counsellor of mines.

USING OLD RAILS FOR CAR SILLS.—Mr. Geo. Richards, the Master Mechanic of the Boston and Providence railroad, says the National Car Builder, has recently built two gondola cars in which old steel rails are used for longitudinal sills. He also contemplates building a flat car for carrying lumber and a merchandise box car upon the same plan. Four 30-foot rails, weighing 57 pounds to the yard, are used in each of the two cars already built. They are placed tops down, with strips of plank bolted to their flanges as a foundation for the floor. The bolts are three feet apart, and the floor planks are spiked to the strips in the usual way. The transom timbers are bolted to pieces of iron riveted to the web of the rails and bent around underneath their reversed tops, so as to secure a complete bearing from floor to transom. The end sills are of oak, in which recesses are made with pocket castings inserted in them for the reception of the rail ends. These are held to the sills by forked bolts riveted to the web of the rails, and passing through the sills and castings. There are four longitudinal truss rods 1 1/2 inches in diameter. The drawing attachments are put in as easily and as cheaply as in a wooden floor-frame, and the entire construction is quite simple and free from difficulty. One of the completed cars weighs 17,250 pounds, and the other 18,750 pounds, with sildings, and they have carried 34,630 and 43,560 pounds of coal respectively. Their length over end sills is 30 feet 11 inches.

WROUGHT IRON WHEELS.—The object of the invention of Mr. L. Schwartzkopff, of Berlin, is to make the nave and the spokes of wrought iron wheels, especially for railway carriages, without any weld and out of a single bloom. For this purpose he uses a mold of cast iron or other suitable material consisting of two parts, each part having on its face the half-mold of the nave and spokes to be produced. Moreover, the upper part has in its center an opening about the diameter of the nave, and of a length sufficient to contain the bloom out of which the nave and spokes are to be made. The two parts of the mold are firmly bolted together and placed under a powerful hydraulic press connected to an accumulator or other arrangement for storing up water pressure. A bloom of proper size, to which a welding heat has been given, is then thrown into the aforesaid central opening of the upper part of the mold, and by means of the hydraulic press, a piston is made to enter into this opening, thereby pressing the material of the bloom during its soft state into all the cavities of the mold, so as to complete the nave with the spokes at a single operation. The parts of the mold are then separated, and the finished piece is taken out.

CARPING SHAPES AND GRADES.—Many suggestions have from time to time appeared upon the subject of preventing or lessening the liability to accidents arising from the entanglement of some portion of a workman's garments in a swiftly revolving shaft, such accidents, as is well known, being lamentably common. The American Manufacturer says that one of the simplest methods, it would seem, of rendering these casualties impossible, without involving the necessity of constructing a railing or fender about the moving piece in dangerous places, is to cover the shaft with a loose sleeve along its entire length. This may be made of sheet-iron or zinc, and should be movable if desired; it should also be covered within, and at the ends with leather, to prevent noise. Arranged in this manner, the friction between it and the revolving shaft will be sufficient to cause the sleeve to rotate with the latter; but in the event of any decided resistance being brought to bear upon it, as in the case of the entanglement of an operative's clothing, the sleeve will at once be brought to rest and permit of its extrication without serious injury. The same plan of loose covers is, of course applicable to cog-wheels or pulleys.

THE TRANSPORTATION OF PETROLEUM IN YESSELS.—The Kingston British Wharf, of October 5th, says: "An oil tank vessel, designed for the oil trade between Sarnia and Montreal, has just been completed. Some 85,000 pounds, or 42 tons of iron, have been consumed, and the tanks, of which there are six, three on each side, will carry about 400 tons of oil. It is the intention, we believe, to have two more tanks made to lie on the deck of the schooner to make her deep enough to sail down the lake. These will be lightened here. The capacity of the six tanks will be nearly 114,000 gallons, and the total, when full loaded, about 150,000 gallons.

A BRIDAL CAR.—We are pleased to learn that the Canadian Southern railway has determined to place a "bridal car" on its line—a luxury which we are assured will supply "a felt want" in that section of country.

FINDING IRON ORE WITH THE MAGNETIC NEEDLE.

Prof. Thalin has communicated to the Swedish Scientific Academy a paper of much importance on a new method of prospecting for iron ores by means of the magnetic needle, which is described as follows in the Iron Age: At a great number of points in a field which is to be prospected for attractive iron ore, the horizontal components between the magnetism of the earth and the distributing force of the ore deposit are measured, and with the aid of these observations isodynamic curves are laid down, from whose form and nature conclusions of the location and importance of the ore deposits are drawn. The instrument by which the above field operations are performed is called a magnetometer, and consists in its principal parts of a common tripod-compass graduated only into whole degrees. From the compass-box a horizontal arm extends, upon which the field magnet required for determining the direction can be laid in such a manner as to keep constantly the same distance from the movable needle. In addition, it is easily ascertained whether more readings will be required at intermediate points. After these measurements are plotted, the points of equal angles of deviation are to be connected. These isodynamic curves are in an ore field usually closed lines, and they group around two distinct points. One of these points is situated north of the ore deposit. It is determined by an angle which is greater than any other, and which is called the maximum angle; the other point is situated in a southern direction, and determined by an angle smaller than any other, and which is therefore called the minimum angle. The former point corresponds to the least intensity, and the latter to the greatest. Underneath the connecting lines of these two points, which Thalin calls the magnetic meridian of the ore deposit, is the most important portion of the ore deposit, in general, to be expected. This method, in its application to prospecting, for attractive ores, has proved to be very useful, and at several places magnetic maps have already been delineated.

WARMING THE PISTON.

The use of the steam jacket, remarks the American Manufacturer, in connection with the cylinders of steam engines and the advantages attendant thereupon are well known, but the diagrams taken by the dynamometer show that a large amount of condensation still takes place; a portion of the condensed steam in the cylinder is evaporated anew during the expansion and another very important portion is also evaporated; but by taking the heat from the surrounding parts of the engine, thus causing a rapid cooling of such parts; those parts which are immediately surrounded by the steam jacket are not so surrounded, such, for instance, as the piston and rod, are relatively cold on the arrival of the steam in the cylinder, and they therefore condense a large portion of it before they arrive at the same temperature as the steam which flows in. The object of the invention of Madam Veuve Andre, of Thann, Alsacia, is to avoid this latter condensation, such object being attained by forming the piston and piston-rod hollow; the spaces in the two parts being made to communicate with each other. Steam is introduced into the piston and rod through a pipe which is attached to the piston and passes through a stuffing box in the end of the cylinder. This pipe slides in a steam supply-pipe, which is provided with a stuffing box, and has an inlet for the admission of steam and an outlet for the condensed steam. The outlet may communicate with a pump to draw off the condensed steam.

A NEW MAIL CAR.—The postoffice authorities have been greatly aided by inventors in devising means to enable them to do the quick work necessary on the flying postoffices on the railroads. We read that a new and improved mail car has just been completed by the Chicago, Milwaukee and St. Paul Railroad Company for use on their road, the car having been constructed in Milwaukee by Mr. Bailey, master mechanic of the road, from plans furnished by Captain J. E. White, Superintendent of the railway mail service, sixth division. It is 50 feet in length, and has 12 wheels, carried under two patented trucks. It is fitted with Miller platforms, and the improved Westinghouse automatic air-brake. The principal improvements are, first, the increased space given; second, the new arrangement of the mail bags, whereby the distribution is facilitated; and third, the increased light and superior accommodation for the distributing clerks. In the old cars the papers were distributed into a semi-circular case, which occupied a full half of the car and admitted light from one side only. Now the bags are carried on iron racks and rest on the floor, while the letters are sorted into pigeon-holes at one end of the car. It is estimated that fully 50% more mail matter can be handled under the new arrangement within a given time than was possible in the old cars, and that the clerks can attend to this extra business with less trouble than they formerly could. A second car will be completed within the next two weeks, the cost of the two being less than \$10,000.

When a person has the ability and range of experience necessary for the correct investigation of nature, it is a waste of time and talent, that he must, for bread-and-butter reasons, drudge in the college, or university, or the ordinary routine of professional service.—Sterns P. Monds.

A PECULIAR CASE OF LEAD POISONING.

We learn from the Medical Record that a popular district of Paris has lately suffered from an epidemic of lead poisoning which presents some noteworthy features. Dr. Ducamp has had 65 of these cases under observation, and he made them the subject of a paper read before the Societe de Medecine Publique on July 25th. The patients belonged to all classes of the population; in some families all the members, both old and young, were affected. After careful investigation, Dr. Ducamp found that all his patients were served from the same bakery, and, as he could positively exclude all other methods by which the poison could be introduced into the system, he came to the conclusion that the bread was the agent morbid. Chemical examination showed that it contained lead; it was evident, however, from the character of the baker, and from the fact that he and all his family were among the most severely affected victims, that the lead was not placed in the bread with criminal motives, while, on the other hand, the fact that the water and flour were the same as were used by the neighboring bakers, whose bread was not poisoned, showed that the substances were not toxic. Dr. Ducamp finally ascertained that the baker had been using old wood taken from demolished buildings to heat his ovens, and here he struck the root of the trouble. This wood had been repeatedly painted with white lead, and when it was consumed by the fire an oxide of lead was formed, which was deposited in a pulverized form on the floor of the oven. When the embers were withdrawn, and the bread put into the oven, the oxide of lead probably adhered to the bottom of the latter, and was removed with it. The correctness of this theory was confirmed by two striking facts: The persons whose duty it was to brush the loaves, and who must have inhaled a portion of the lead and inhaled it in the form of dust, were the first to be affected and had the most severe attacks. Again, in one family there were two women, of whom one ate only the soft part of the bread while the other ate the crusts. The former escaped entirely, but the latter was attacked so severely that her life was in danger.

RAGOUT OF RABBIT.

The following from the Prairie Farmer may help some of our housewives turn the plentiful rabbit to account: Remove the head and neck; joint the rabbit—when it has been nicely skinned—and lay it in salt water for one hour before cooking. Place some scraps of salt pork in a frying pan, add some chopped onion, a pinch of cloves, allspice, savory, sage, cayenne pepper, a bay leaf and some bruised celery seed. When the onion is slightly browned, put in the rabbit and cover with cold water; put a lid on the saucpan, and stew until tender adding boiling water if too dry, and salt to taste. When done, place the rabbit on a warm dish; stir into the gravy large teaspoonful of butter, rolled in a small spoonful of browned flour; add one half teaspoon of fresh rich milk, and let all come to a good boil, take from the fire; stir in a little lemon juice, some wine, or even good vinegar, in the absence of anything better; and strain gravy over the meat; garnish the dish with sliced lemon and small pointed pieces of buttered toast of equal size and shape; serve hot. The seasoning can be varied by the use of walnut catnip, curry powder, or any pungent sauces, but in this, as in all similar dishes, no one taste should be allowed to predominate over others; the seasoning of made dishes should be varied, for the palate soon tires of any stereotyped flavor.

TO REMOVE MILDEW.—Wet the spot in lemon juice, then spread over it soft soap and chalk mixed together, and spread where the hotter rays of the sun will beat upon it for half an hour, if not entirely removed repeat the same. Or wet in clear lemon juice and lay in the sun; or soak for an hour or two, and then spread in the sun. Or mix soft soap, powdered starch and half as much salt together, and moisten quite freely with lemon juice. Spread this on both sides of the spots and spread in the sun. As soon as dried wet the spots again with the same mixture, lay in the sun and repeat the operation till the spots disappear. If newly spotted once wetting will be sufficient. Or wet the spots in chloride of lime just dissolved in water, and spread in the sun only a few minutes, then rinse. Repeat if the mildew is not all removed; but do not let this preparation remain but a few minutes at a time before rinsing, even if the process has to be repeated several times, as chloride of lime will injure the cloth if left on long.

NOTE ON CADMIUM.—The uses of metallic cadmium, says a writer in the Journal of Chemistry, are limited to the manufacture of alloys having low melting points. One of these alloys, known as Wood's fusible metal, melts at 70° C, and consists of Cadmium..... 2 parts or 2 parts. Tin..... 1 part or 2 parts. Bismuth..... 15 parts. Lead..... 8 parts or 1 part. A spoon made of this alloy, when placed in boiling water, will melt like wax. By varying the proportions, alloys may be obtained having any required melting points, and may be used as safety plugs in steam boilers. Wood's alloy is also used in taking impressions of objects and making molds. An amalgam of cadmium is sometimes employed by dentists for filling teeth.

MEASUREMENT OF WATER SUSPENDED IN STEAM.—P. GAZEL, in view of the difficulties introduced into calculations of boiler efficiency by foaming or other mechanical suspension of vapor, has described an apparatus for determining the degree of humidity, as well as for finding the density, either of saturated or of dry steam, at high pressures. His invention was suggested, in part, by the recent investigations of Hirt, Lecloure and Halbaner.

GUM TREES IN JAMAICA.—The eucalyptus globulus planted in Jamaica some six years ago, have acclimated themselves so thoroughly on the plateaus of this island that many have attained a height of 60 feet, with a trunk of one foot diameter near the earth. They do not prosper in the low lands of the island.

HOW TO TREAT AND AVOID DIPHTHERIA.

The California Board of Health has issued a timely address to the people of the State on the continued prevalence of diphtheria in the State, and an apparent increase in some localities, and calls attention to precautionary measures. When diphtheria appears in a family, precautions commonly taken to prevent communication of the sick with the well should be adopted. A person being attacked with the disease, access to the room should be prohibited to all except those in the capacity of nurses. Other children should not be allowed to visit the house, and the same rule might be judiciously applied to adults. The room of the patient should be well ventilated. All woolen clothes, curtains, and where practicable, carpets should be removed therefrom. The saliva and expectoration of the sick should be kept disinfected by requiring the vessels used to receive them, to contain a little of one of the disinfectant solutions. The clothes removed from the body of the patient, as well as the bed linen, when changed, should be immediately dipped in boiling water, to which should be added every gallon one ounce of the sulphate of zinc, or half an ounce of chloride of zinc or condia fluid. Chloride of lime, sulphate of iron and common copperas are objectionable, as the former, if used of sufficient strength, will injure the fabric, and the latter will stain it. The funerals of those dying of this disease should not be attended by children. There is reason to believe that diphtheria may be communicated in the school room, the liability being increased by the fact that the disease may not be at once recognized by parents, who consequently exercise no restraint upon the attendance of their children. There cannot be too much caution used to avoid this too common method of disseminating this and other infectious diseases. After convalescence the child should be kept from the school until attendance is considered safe by the physician. Cleanliness in and about dwellings; drawing off or providing a suitable receptacle for the waste water, slops, and accumulations in the kitchen; the cleaning and disinfection of cesspools, sewers and privies; and where drains into these lead from the interior of houses, the provision of a suitable trap, preventing the entrance of sewer gas, is of first importance, as the traps in use are often insecure, and we cannot too strongly urge the necessity of close attention to this subject. In addition to the trap the connection of a ventilating tube with the soil pipe, extending above the roof of the house, would afford yet greater security. Disinfection in such cases may be cheaply effected by the free use of sulphate of iron, copperas, or by chloride of lime. In towns which rely upon wells for drinking and culinary purposes, care should be taken to avoid their contamination by contiguous cesspools and other filth deposits. When diphtheria is suspected in a member of the family, send for the family physician, and under no circumstances rely upon the various nostrums or specifics so often published in the newspapers, or recommended by kind-hearted and ignorant advisers.

THE AIR AS A GEOLOGICAL AGENT.—In a foreign publication we read as follows: An all-powerful geological agent is the atmosphere we breathe. Without its aid we should know never a stratified formation. The earth would simply form a ball of truly primitive rock, resulting from the cooling down of the original nebulous mass set apart for our globe, the only variation in which primeval and perennial crust being that of the different strata of higher specific gravity towards the interior. We should have no coal, no metalliferous deposits, no rivers or seas, and no rain—consequently no denudation by "rain and rivers"—for the vapor of water could not ascend into the empty space. We should have—but, last and not of all, there would be no "we." Life would be impossible, and the earth would finally degenerate into a "pale-faced moon." That this is probably her ultimate mission cannot be denied. The only consolation is that owing to her larger size, and therefore slower rate of cooling than the moon, she will have gone through a somewhat more extended geological course. There is undoubtedly a very intimate connection between secular cooling and withdrawal of atmosphere for the cooler the interior the smaller will be the return of gaseous elements to the surface; and probably before Saturn and Jupiter have cooled down to a habitable temperature, the condensed earth will roll through space—cold, void and airless. Sooner or later nothing is more certain than that—to this favor she must come.

THE NERVOUS PERSON.—A writer in the Journal of Chemistry holds out some hope to nervous people who will make the effort. The nervous ones, made so by physical defects, contrive to secure a considerable amount of happiness and largely to influence the world for good. This is accomplished by a will power which is a measure of the cultivated and strengthened, and every nervous sufferer should strive to gain it and never yield to despair. Fight out your destiny, rise superior to your weakness; this is the text from which sermons cannot be too often preached. A nervous person exists in the world under great disadvantages. It is like being compelled to play a perfect tune with an imperfect instrument or to row a boat against wind and tide. Life is fitful, capricious and every step uncertain. One may be progressing pretty fairly to-day, but to-morrow the nervous currents are reversed and thick darkness rests upon everything. This is applicable only to the intense forms of nervousness, such as are often met with.

HOW TO DISTINGUISH STEEL FROM IRON TOOLS.—It is impossible to distinguish between iron and steel tools; they have the same polish, the same workmanship; use will commonly show the difference. To make this distinction quickly, place the tool upon a stone and drop upon it some diluted nitric acid (four parts of water to one of acid). If the tool remains clean it is of iron; while if of steel it will show a black spot where touched by the acid; these spots are easily be rubbed off.