The Mineralogist.—The description and locality of every important Mineral in the United States.

(*Continued.*)

SULPHURET OF MOLYBDENUM. (MOLYBDENITE.)

Occurs in masses and crystals, of a lead gray color; brilliant lustre; lamellated structure; specific gravity of 4.5; infusible; unctuous; plates flexible; dissolves in carbonate of soda. Found at Brunswick, Blue Hill Bay, Camdage farm, Bowdoinham, Me.; Landaff, Westmoreland, Franconia, N. H.; Shutesbury, Brimfield, Shaftsbury, Mass.; Brookfield, East Haddam, Saybrook, Ct.; Warwick, Island of N. Y., in the Highlands, N. Y.; Franklin furnace, N. J.; Chester and Delaware Cos., Philadelphia, Pa.; Baltimore, Md.; Crown Point, Westchester and Putnam Cos., N. Y.

NACRITE.

Resembles a whitish soft earthy talc, with a greasy feel, occurring in minute scales; friable; swells when wetted or heated. Found at Brunswick, Me.; Smithfield, R. I.; Farmington, Ct.

ARSENICAL NICKEL.

Occurs usually massive, of a pale copper red color; metallic lustre; specific gravity of 7.35; brittle; when heated emits the odor of garlic; dissolves in aqua regia; forms green solution in aqua fortis. Found at Chatham, Ct.; Frederic Co. Md.

NOVACULITE. (WHETSTONE.)

Is a finely grained slate, of light and dark shades of color; compact texture; translucent on the edges; fissile; fragments sharp edged; specific gravity of 2.74; fusible; Localities: Kennebec River, Me.; Thetford, Vt.; Malden, Dorchester and Charlestown, Mass.; Berks Co. Pa.; 7 miles west of Chapel Hill, N. C.; Lincoln and Oglethorpe Cos., Geo.; Unionville, Bush Creek, Md.; the Cove of Wachita, As.

COMMON OR SEMI-OPAL.

Compact and amorphous; colors, white, gray, yellow, bluish, greenish to dark grayish green; translucent and nearly opaque; brittle; scratched by quartz and scratches glass; infusible: insoluble. Found at Litchfield, Ct.; Corlær's Hook, N. Y.; Falls of the Delaware and Easton, Pa.; Bare Hills, Md.

PARGASITE.

Occurs in rounded grains of a grayish or bluish green color; much lustre and specific gravity of 3.11. Scratches glass; fusible; translucent. It is found at Chester, Mass.

PICROLITE.

Is a fibrous variety of serpentine, occurring massive, of a greenish color, splintery fracture, glimmering lustre and specific gravity of 2.60; fusible with borax; translucent on the edges. Found at Kelly Vale and Weatherfield, Vt.; Milford and West Haven, Ct.

PIMELITE.

Is a green clay or earth, occurring in crusts or little indurated masses, dull or glimmering in lustre; soft, unctuous and infusible, but turns dark gray. Found at New Fane, N. H.

PINITE. (MICAREL.)

Occurs massive, also in prismatic crystals of a greenish white color, brown or deep red; glistening lustre; argillaceous odor; and specific gravity of 2.9; yields to the knife; powder, unctuous; infusible. Found at Bellows Falls, N. H.; Lancaster, Mass.; Haddam, Ct.

PITCHSTONE.

Is an unstratified and volcanic rock, of a gray, green, blue, yellow, brown, red or black color; slaty structure; resino-vitreous lustre; specific gravity of 2.3 to 2.6; scratches glass; generally fusible. Found at Bare Hills, near Baltimore, Md.

NITRATE OF POTASH. (NITER.)

Is a white crystalline salt, having an acrid, bitterish taste; deflagrates. Occurs in Madison Co. Ky, and Rackoon Mountain, Geo.

POTTER'S CLAY.

Occurs in masses, of a grayish white, reddish or bluish color; specific gravity of 1.08 to 2. Soft and unctuous; when dry, receives a polish from the nail; becomes tenacious and ductile when wet and worked; infusible. Found at Martha's Vineyard, Mass.; Bordentown and Burlington, N. J.; Philadelphia, Pa., Maryland and Missouri.

Several cannon balls found in the Vatican Gallery at Rome, have been placed in the collection of coins, with the inscription, "Gift of Pio Nono."

Lightning Conductors.

No building can be considered secure without a good conductor, and nine-tenths of those now having them are not much better off, owing to the fact of their faulty construction, their inadequate height and termination, and the very negligent manner of their application. As the conducting powers of the rod is greatly influenced by extraneous circumstances, it should be made, not only with great care, but in strict accordance with those principles which experience has proved necessary, in order to attain the highest possible degree of this essential requisite.

The Conductor should be made either of copper or iron,—the first is by far the best, as it is not liable to rust, and possesses eight times the conducting power of the latter; but its very high price operates to exclude it from general use, and causes iron to be preferred, as its moderate cost, brings it within the means of every citizen and farmer throughout our city and country.

The Conductor should be of a rounded form three quarters of an inch in diameter—the larger the better security, as the conducting power is in proportion to the solid mass, it should be continuous, the bars of which it is composed being well screwed into each other, or nicely adapted by means of a mortice and tennon jointed and pinned firmly together, by which the surfaces are brought into the most intimate contact.

The Conductor should be terminated at its superior or upper end, by a stem of copper, capped either with one or more points of gold platina, or silver; but of these, the first is the best, as its conducting power is much greater than either of the other metals, and if made solid, or well galvanized, is less liable to rust, a common result in a climate so moist and variable as that of ours. In addition to this, the rod should be well painted with several coats of black paint, which not only protects it from the moisture, but also tends to increase its conducting power.

As to the application. The efficacy of a conductor is greatly increased by its height above the building, and in this particular the greatest possible ignorance prevails, not only in the community at large, but in those who profess to understand the subject, and to furnish the necessary means for protection to others.

It is a common occurrence, all over the land, to see large barns and public buildings of great dimensions, say of thirty, forty-five or sixty feet in extent, protected with a small rod, elevated two or 3 feet above the chimney or ridge of the roof, an experiment not only dangerous in itself considered, but a useless expense, without securing in any way, the object for which it was applied.

The established rule is, that a conductor will protect a space every way only twice the length of its height above the building, and this rule should never be violated in the adaption of the conductor, for if it is placed only three feet above the ridge of the roof of a house or barn say thirty feet in length, it follows of course, that only six feet in every direction from its point receives protection, whilst the rest of the building is left exposed to almost certain destruction, if struck by lightning under these circumstances, and in this way it can be readily understood why houses having a rod of the ordinary means of protection have fallen in many parts of our land.

One conductor is sufficient for almost any sized building, provided its elevation is equally great, but when this is not desirable, two or more placed in different situations should be employed—particular if there be several high points of chimneys.

It should be secured to the building by means of iron or wooden stays, embracing necks of glass bottles, rings of horn or dried wood, through which the rod should be passed—thereby removing all danger of the lateral discharge, which however, is not great, if the rod be perfect, and due attention be paid to facilitate the discharge at its termination into the earth's surface.

The termination of the rod should be into earth permanently moist, which is found ordinarily at five or eight feet in sandy or gravelly soil. This is of vast importance, and, if overlooked, will endanger the building and its inmates, however perfect the conductor may be in its construction and application; much, almost every thing depends upon this principle being carried out, that the rod must be inserted into earth permanently moist

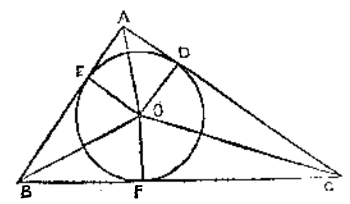
In order to guard the rod from rust, when passed into the ground, it will be necessary to paint it a number of times with good black paint, and the hole, in which it is inserted, should be partially filled up with fine charcoal, and this not only retains moisture when wet, but likewise counteracts that tendency to rust which proves so destructive to iron with a few years' exposure to our climate.

With due attention to these directions, buildings may be considered safe, but galvalized rods are better than painted ones, that is, the iron coated with zinc by scouring it bright and dipping it into a bath of molten zinc and salamoniac.

Solution of Problems on Page 288, No. 36.

The solution of Problem 1, in your journal of last week, seems to depend on the property of right angled triangles, embodied in the following Proposition:—

In a right angled triangle, as the sum of the three sides is to either of the legs, so is the remaining leg to the radius of an inscribed circle.



Let A B C be the triangle right angled at A, and E D F the circle inscribed in it, of which the radii O D, O E and O F, are drawn to the point of contact D E F. Now it is evident, that

2. Area ABC=BA, AC. And also 2. Area ABC=2.AOB+2.BOC+2.COA=AB×OE+BC×OF+AC×OD=(as OE=OF) OD) AB+BC+AC. OD.

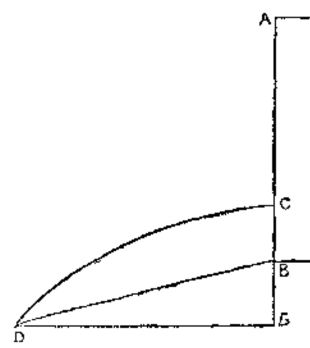
Hence AB+BC+AC OD=BA. AC. And AB+BC+AC : BA : : AC : OD. which was to be proved.

To apply this to the case in question. If AC be 16 and AB be 9, BC must be √16×16×9×9=18.357. We have then this proportion, 16+9+18.357 : 16 : : 9 : 3.321=the radius of the circle. Double this, or 6.642, is the diameter.

JOSIAH T. TUBBY.

New York, May 30, 1849.

SOLUTION TO PROBLEM 2.



Let A B denote the height or sides of the vessel. C the hole from which the water spouts in the parabolic curve D B. Draw the line D *b* and join B *b* so that the angles B *b* D shall be a right angle. Then B D is a maximum, and since the angle *b* B D is constant B *b* is a maximum, also *b* D. But when D *b* is a maximum D*b*. tan. BD*b*=*b*B or 2 AC. tan. BD*b*=2 AC=AB or 2 AC (tan. BD*b*—1)=AB or 2 AC (1—tan. BD*b*)=AB : : AC= AB / 2(1–tan. BD*b*)

Taking the positive value I find A C=9,433 feet, which was required.

RICHARD HINCHCLIFFE.

Ballard Vale, Mass.

[Mr. Hinchcliffe sent a solution of Problem 1 also. It was the same as Mr. Tubby's. We have received so many new problems, and solutions to those already proposed, that we have concluded to publish no more, as it requires too much attention to examine them.

An invention is announced to protect banks from robbery. The moment they touch the locks, a galvanic battery knocks them down and rings a bell.

The Crank.

BY JOHN BOURNE.

Many persons had supposed that there was a loss of power by the use of the crank, because it is not capable of exerting much power at the dead centres, (top and bottom,) but at those particular periods, there is little or no steam consumed, so that there can be no waste of power, for the steam used constitutes the power expended. Those who imagine that there is a loss of power by the crank, confuse themselves by confounding the vertical with the circumferential velocity. If the circle of the crank be divided by any number of equidistant horizontal lines, it will be obvious that there must be the same steam consumed and the same power expended where the crank pin passes from the level of one line to the level of the other in whatever part of the circle it may be, those lines being indicative of equal ascents or descents of the piston. But it will be seen that the circumferential velocity is greater with the same expenditure of steam when the crank pin approaches top and bottom centres, and this increased velocity exactly compensates for the diminished leverage, so that there is the same power given out by the crank in each of the divisions.

Many plans have been projected as substitutes for the crank and for gaining lever power, but they all display an ignorance of first principles,--no power, speaking critically scientific, can be gained by a multiplication of levers and wheels, and those who have substituted other mechanical contrivances for the simple crank, have generally found out what the greatest of mechanics, James Watt, found out long ago viz: that the crank was the best substitute for all other contrivances to accomplish the same object.

He tried the Sun and Planet wheels, contrivances which have no superior in their line, but them he wisely laid aside for the crank, and we venture to predict that the crank will hold its own for 100 years to come, with all other contrivances to convert a reciprocating into a rotary motion.

Source of Electricity.

The earth is the great reservoir of electricity, from which the atmosphere and clouds receive their portion of this fluid. It is during the process of evaporation that it is principally excited, and silently conveyed to the regions above; and also during the condensation of this same vapor the grand and terrific phenomena of thunder and lightning are made manifest to our senses.

In order to form a correct estimate of the immense power of this agent in the production of electricity, we must bring to our view the quantity of water evaporated from the surface of the earth, and also the amount of electricity that may be developed from a single grain of this liquid. According to the calculations of Cavallo, about five thousand two hundred and eight millions tons of water are probably evaporated from the Mediterranean Sea, in a single summer's day. To obtain some idea of the vast volume of water thus daily taken up by the thirsty heavens, let us compare it with something rendered more apparent than this invisible process. President Dwight and Professor Darby, have both estimated the quantity of water precipitated over the Falls of Niagara, at more than eleven millions tons per hour. Yet all the water passing over the cataract in twenty days, would amount only to that ascending from the Mediterranean in one day. More recent estimates make the mean evaporation from the whole earth as equal to a column of thirty-five inches from every inch of its surface in a year, which gives ninety-four thousand four hundred and fifty cubic miles, as the quantity continually circulating through the atmosphere.

To Treat Peach Trees.

The peach trees are only of a few years duration now, after which they wither and die. It has been suggested that grubs are the cause of this early decay and that they can be destroyed by removing the ground around the root of the tree and adding wood ashes or newly burnt lime which should be left till fall and then be removed so that the frost can get to them. If this is properly managed, the latter will effect the destruction of the worms without injuring the tree.