Scientific Museum.

Metallic Ore Veins.

Certain ores, which contain the metals most necessary for man's use, are found in greatest abundance, constituting great masses in rocks of different kinds or distributed in lodes, veins, nests, concretions, or beds with stony or earthly admixtures. These precious stores occur in different stages of the geological formations but their main portion exists only in the primary strata, and suddenly cease to be found towards the middle of the secondary series; but iron the most necessary of all the metals, is found as high as the beds immediately beneath the chalk, when this ceases to exist, except as a mere colouring matter in the earth. The strata of gneiss and mica-salt are, in Europe, the great source of metallic veins. There is hardly any kind of ore which does not occur there in sufficient abundance to render their working profitable, and many metals are to be found only in these strata. The transition rocks and the lower part of the secondary series are not so rich, neither do they contain the same variety of ores. But this order of things which is presented by Great Britain, Germany, France, Sweden, and Norway, is far from forming a general law since in the middle and northern parts of South America, the gneiss, is but little metalliferous; while the superior strata, such as the clay-schists the sienitic porphyries, and the limestone, which complete the transition series, as also several secondary deposits include the greater portion of the immense mineral wealth of that region of the globe.

Lodes or mineral veins are generally distinguished by the English miners into four species:—1st, The rake vein, which is a perpendicular mineral fissure, and is the form best known amongst practical miners; it commonly runs in a straight line, beginning at the top of the strata, and cutting them downwards, generally farther than can be reached. The vein is sometimes found quite perpendicular; but it more frequently inclines or hangs over at a greater or less angle, or slope which is called by the miners, the hade, or hading of the vein. The bearing of the vein in this line of direction in which the fissure runs. 2ndly, The pipe vein which resembles in many respects a huge irregular cavern pushing forward into the body of the earth in a sleeping direction under various inclinations from an angle of a few degrees with the horizon to a dip of 45° or more. The pipe does not in general cut the strata across like the rake vein, but insinuates itself between them, so that if the plane of the strata be nearly horizontal, the bearing of the pipe vein will be nearly conformable; but if the strata stand up at a high angle, the pipe shoots down nearly like a shaft. 3rdly, The flat or dilated vein, which is a space or opening between two strata or beds of stone, the one of which lies above, and the other below the vein, like a stratum of coal between its roof and pavement; so that the vein and strata are placed in the same plane of inclination. These veins, like coal, are found interrupted, broken and thrown up or down by slips, dykes or other interruptions of the regular strata.—In the case of a metallic vein a slip often increases the chances of finding more treasure.—These veins do not preserve a regular thickness throughout like coal seams, but vary considerably in thickness even in a very small area.—4thly, The interlaced mass, which is the union of a multitude of small veins, mixed in every possible direction with each other, and with the rock. To these may be added the accumulated vein, a great deposit placed without any order in the rocks, apparently filling a previously formed cavern. Mineral veins are subject to derangements in their course, which are called shifts or faults. Thus, when a transverse vein throws out, or intercepts a longitudinal vein, and alters its direction it is called a shift, and this vein will generally be found again by following the interrupting vein on that side that makes an obtuse angle with the principal vein. When a fault occurs it is necessary to examine whether the strata be raised or depressed, and the vein may then be found again by mounting or descending accordingly.

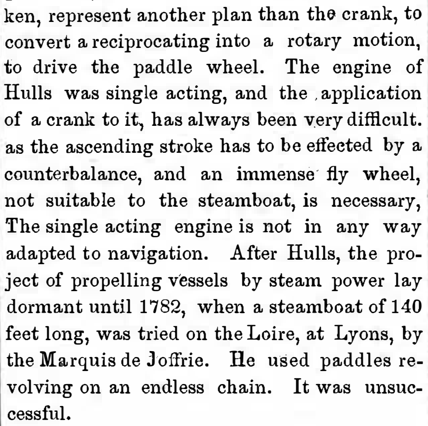
History of Propellers and Steam Navigation.

[Continued from page 80.]

MARQUIS DE JOFFRIE, RUMSEY, FITCH.

There seems to be some discrepancy in the accounts given of Jonathan Hulls' application of steam to propel vessels. Hebert, in his history, says that Hulls took out a patent for the application of the crank, whereas Hull's pamphlet, from which the engravings are taken, represent another plan than the crank, to convert a reciprocating into a rotary motion, to drive the paddle wheel. The engine of Hulls was single acting, and the application of a crank to it, has always been very difficult. as the ascending stroke has to be effected by a counterbalance, and an immense fly wheel, not suitable to the steamboat, is necessary, The single acting engine is not in any way adapted to navigation. After Hulls, the project of propelling vessels by steam power lay dormant until 1782, when a steamboat of 140 feet long, was tried on the Loire, at Lyons, by the Marquis de Joffrie. He used paddles revolving on an endless chain. It was unsuccessful.

Fig. 5.

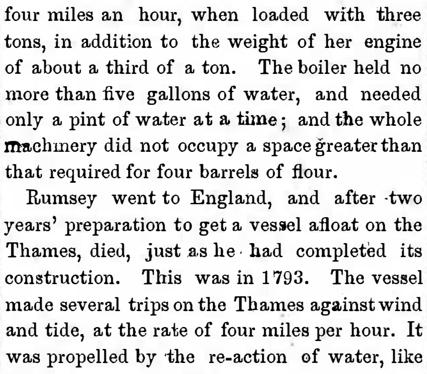


In 1784, Mr. James Rumsey, of Shepardstown, Va., made a private experiment with a steamboat, and in 1787, a public on the Potomac. Rumsey's boat was about 80 feet long, and was propelled by a steam engine which worked a vertical pump in the middle of the vessel, by which the water was drawn in at the bow, and expelled at the stern, through a horizontal trunk inher bottom. The re-action of the effluent water carried her at the rate of four miles an hour, when loaded with three tons, in addition to the weight of her engine of about a third of a ton. The boiler held no more than five gallons of water, and needed only a pint of water at a time; and the whole machinery did not occupy a space greater than that required for four barrels of flour.

Rumsey went to England, and after two years' preparation to get a vessel afloat on the Thames, died, just as he had completed its construction. This was in 1793. The vessel made several trips on the Thames against wind and tide, at the rate of four miles per hour. It was propelled by the re-action of water, like his first one on the Potomac.

The contemporary of James Rumsey was John Fitch, a man of great mechanical resources and inventive powers. He published the following description of his boat in the Columbian Magazine, December, 1786.

Fig. 6



The cylinder is to be horizontal, and the steam to work with equal force at both ends.—The mode by which we obtain a vacuum is, we believe entirely new, as is also the method of letting the water into it and throwing it off against the atmosphere without any friction.—It is expected that the cylinder, which is twelve inches in diameter, will move with a clear force of eleven or twelve cwt., after the frictions are deducted; this force to be directed against a wheel eighteen inches in diameter. The piston is to move about three feet, and each vibration of it is to give the axis (or shaft) about forty evolutions. Each evolution of the axis moves twelve oars, or paddles five and a half feet. They work perpendicularly, and are represented by the strokes of the paddle of a canoe; as six of the paddles are raised from the water six more are entered, (three on a side) and the two sets of paddles make their strokes of about eleven feet at each evolution. The cranks of the axis act upon the paddles about one-third of their length from their lower ends, on which part of the oar the whole force of the axis is applied. The Engine is placed in the bottom of the Boat, about one-third from the stern, and both the action and evolution turn the wheel the same way.

It is stated by Charles Whittlesley, Esq., in his pamphlet, " Justice to the memory of John Fitch," that the first model of a steamboat built by Fitch had side wheels, but the buckets of them were found to labor so hard under water that he adopted the plan of propulsion which we have represented above, and the construction of such a boat became to him the highest object of his ambition. The best biography of John Fitch is published in the Friend's Weekly Intelligencer, by Mr. Daniel Longstreth, of Warminster, Pa.,—he adheres to the point that John Fitch preferred the wheels, and adopted the paddles, which were patented by Henry Voight, once Chief Coiner of the U. S. Mint, at Philadelphia, and was one of Fitch's fund-holders. Between the two accounts there is a discrepancy, but none so far as it respects the wheels being attached to his first model. We are of opinion that Fitch preferred the paddles, as they were represented in his drawings, and also a model after he secured his patent in 1791. Fitch went to England in 1793, and was a disputant for public patronage with Rumsey. He was unfortunate in pecuniary matters, but had strong faith in the future *king-sway* of steam navigation.—He was an ill-used man, and should have received honors where he met with coldness and neglect. He terminated his life at Bardstown, Ky., by poison, in 1796.

(To be Continued.)

The Division of Matter.

Whatever exists is either material or immaterial. All that is material is an aggregation of separable parts and particles; the immaterial portion of existing nature comprises all living and thinking principles. A material thing is a compound; an immaterial existence, a single entirely. Such being the case, the subject of all philosophical inquiries must be either Matter or Mind.

Matter is that substance which affects the senses by sensible qualities; possessing cohesibility and infinite divisibility. It is either ponderable or imponderable. Light, caloric, and electricity, are the imponderables. All ponderable bodies are either organic or inorganic, solid or fluid, simple or compound. Inorganic substances are denominated minerals; organized beings, animals and vegetables.—The former are divisible into the metalic and non-metallic; and include the elements of matter. They are either elementary or the results of composition; being the elements themselves, or formed by their union. These are their divisions; non-metallic fluids, non-metallic solid elements, binary, haloid, and earthy, compounds, metals and metallic ores. The metallic elemental substances now number 43; the non-metallic, 16. Of these all things, visible and invisible, are made; but few, however, are essential to the frame-work of our globe. Organisms are the products of life, and formed by the combination of elements. We shall consider them as endowed with vitality, and constituents of animals or vegetables. The animal kingdom is sub-divided into four; vertebrata, articulata, mollusca, and radiata. The first includes the families: mammalia, birds, reptiles, amphibia, fishes; the second, insects, arachnida, crustacia; myriapoda, annelida, cirrhopoda, rotifera, entozoa; the third, cephalopoda, pteropoda, gasteropoda, conchifera, tunicata; the fourth, polygastrica, echinodermata, acalephæ, polypifera, porifera. All plants are arranged in two grand divisions: phenogamous and cryptogamous; subdivided into 21 classes, of which the former division includes 20: monandria, diandria, triandria, tetrandria, pentandria, hexandria, heptandria, octandria, enneandria, decandria, icosandria, polyandria, didynamia, tetradynamia, monadelphia, diadelphia, syngenesia, gynandria, monœcia, diœcia. This is the alphabet of natural science; the grammar consists of such a knowledge of the divisions as will enable one to read the language of nature with understanding. J. W. O.

"Up," and "Down."

When Columbus held out the certainty of arriving in India by sailing to the westward, on account of the earth's roundness, it was gravely objected, that it might be well enough to sail *down* to India, but that the chief difficulty would consist in climbing *up* back again.

LITERARY NOTICES.

Graham's Magazine, December Number, W. H. Graham, New York, Agent.—It has been our custom to notice favorably the most prominent monthly magazines published in this country. We do so because they are a source of refined and intellectual pastime for the Ladies, whose tastes in matters of literature, as well as other things, should be catered for. The appreciation in which Graham's Magazine is held by them is certainly a high compliment to their discrimination and good sense. The present No. is richly adorned with chaste and elegant engravings. The papers are entirely original, by the best American authors. This Magazine commences a new volume January 1st.

Peterson's Ladies' National, December No.—Terms $2 a-year.—This popular monthly closes its present volume in a style and beauty of arrangement not surpassed by any other magazine of the day. The engravings are beautiful—the contents varied and interesting. For 1850 the number of pages will be increased one-third, while the price will remain unchanged, except that eight instead of seven copies will be furnished for $10. The publisher announces that the January No. will be out in two weeks, and will be an annual itself.

H. Long & Bro., 43 Ann street, have just issued the romantic trial of Mary Schwridler, The Amber Witch. Edited by Wm. Meinhold, a Doctor of Theology. The London Quarterly Review, in speaking of this work, says that "it is one of the very few works of fiction, of late years, which bears about it the unmistakeable marks of classicality." We think so, too, judging from a careful perusal. Price 25 cts.

In noticing Godey's Lady's Book, in our last No., instead of Messrs. Dewitt & Davenport being the Agents, it should have been H. Long & Bro.—the enterprising publishers above.

The third edition of the Graefenberg Manual of Health, is now ready and for sale at No. 50 Broadway. The first edition was sold in a short time, which is an evidence of its appreciation by the public. A cursory glance through its pages satisfies us that it is a valuable family companion, and the price for which it is sold brings it within the reach of all. Price 50 cts.

Experience in Water-Cure.—A familiar exposition of the principles and results of water treatment in the cure of chronic diseases, illustrated by numerous cases in the practice of the author; with an explanation of water-cure processes, advice on diet and regimen, and particular directions to women in the treatment of female diseases, water treatment in child-birth, and diseases of infancy. By Mary S. G. Nichols, Water Cure Physician. Published by Fowlers & Wells, 131 Nassau st., Y. N. Price 25 cts. The volume contains over 100 pages of clearly printed matter, and forms a valuable guide for family use.