

FRANKLINITE—METALLIC ORE.

It frequently occurs that minerals and other things receive names which convey no idea of their nature, but rather excite curiosity from their peculiarity, and such is the case in reference to the above-named substance. As it is a very peculiar and valuable mineral, and as we have had frequent inquiries regarding its nature and uses, we present the following description from a deservedly popular work, the "New American Cyclopædia," published by Appleton, this city:—

Franklinite is a mineral composed of peroxyd of iron, oxyd of zinc, and oxyd of manganese, in appearance much like the magnetic oxyd of iron. It is found in considerable quantities only in Sussex county, N. J., although it is also mentioned as accompanying ores of zinc in amorphous masses at the mines of Altenberg (Vieille Montagne), near Aix la Chapelle. The composition of the Franklinite of New Jersey is:—

| Constituents. | Berthier. | Thompson. | Dickinson. | Albich. |
|-------------------------|-----------|-----------|------------|---------|
| Peroxyd of iron . . . | 66.09 | 66.10 | 66.115 | 66.86 |
| Oxyd of zinc | 17.09 | 17.43 | 21.771 | 16.81 |
| Oxyd of manganese . . . | 16.99 | 14.96 | 11.987 | 18.17 |
| Silica | | | 0.127 | |

Its hardness is 5.5–6.5; specific gravity, 5–5.09. It occurs in large veins or beds at the mines of the New Jersey zinc company at Stirling hill and Mine hill in Sussex county, accompanied by the red oxyd of zinc, lying between the crystalline limestone and the gneiss rocks. At Stirling hill it constitutes the main substance of two beds of considerable magnitude, lying in immediate contact with each other, divided only by a parting seam, running S. W. and N. E. and dipping S. E. about 40° from the hill against which the beds seem to repose, toward and under the bed of the Walkill river. The upper of these beds, lying immediately under the crystalline limestone, is composed chiefly of the red oxyd of zinc with the Franklinite interspersed in granular masses, often assuming the appearance of imperfect crystals. It presents a thickness varying from 3 to 8 feet, and is traced with great uniformity of structure. At times almost perfect crystals of Franklinite are found, particularly where the bed comes in contact with the superincumbent limestone; these crystals are of the regular octahedral form with the edges replaced. The Franklinite constitutes about 45 per cent of the mineral contents, the rest being mainly red oxyd of iron. This bed is extensively worked by the New Jersey Zinc Company, who remove annually about 8,000 tons of the ore to their works at Newark, where they manufacture from it the white oxyd of zinc used as paint; the residuum, after the oxyd of zinc is driven off, being Franklinite, is smelted into iron. The underlying bed appears on the surface or outcrop to be almost a pure massive Franklinite, amorphous in structure, although occasionally also exhibiting very large and nearly perfect crystals of the Franklinite; it contains no red oxyd of zinc, which fact is the distinctive feature between this and the overlying bed, which is generally known as the bed of red zinc. As the underlying bed of Franklinite descends it becomes less pure; the Franklinite being replaced by the crystalline limestone, with the Franklinite and willemite (anhydrous silicate of zinc) thickly interspersed in grains and imperfect crystals. It preserves this character in its entire depth as far as explored, nearly 200 feet below its outcrop; this bed is about 12 feet in thickness, but is not worked. Several hundred feet westerly of these main beds, and higher up on the hill, another bed of Franklinite, mixed with a little of the red oxyd and a good deal of the silicate of zinc, is found, running the entire length of the Sussex hill; on the S. W. point of this vein a considerable quantity of ore is mined by the Passaic Zinc Company, and by them manufactured into white oxyd of zinc at their works at Bergen, near Jersey City. The other locality where the Franklinite is found in large masses is on Mine hill, about 1½ miles N. E. from Stirling hill, following the course of the Walkill to the village of Franklin. Here there are also found two distinct beds lying in immediate juxtaposition; but their relative position as compared with that of the beds at Stirling hill, is reversed, the Franklinite being the easternmost and uppermost, and the zinc being the underlying and westernmost. The formation generally on Mine hill seems considerably disturbed, and much less regular than on Stirling hill. The Franklinite on Mine hill, which promises from surface indications to be a rich and regular body of ore, has, however, not proved so in the numerous openings and explorations made by the Franklinite Iron Company, who erected a large blast furnace here some four years since for the express purpose of working this ore. They found it so much disturbed, and immediately below the outcrop so much mixed with other and useless substances, chiefly an impure garnet (silicate of iron), as to make the ore unfit for any metallurgical purposes. The attempts to smelt it did not prove successful, and the works were abandoned. The underlying or westerly bed, on the other hand, is much purer, and is composed of massive Franklinite, interspersed throughout with more or less red oxyd of zinc in spangles or small lamellar masses. Its outcrop is plainly traceable along the entire crest of Mine hill for nearly half a mile in length, varying from 3 to 5 feet in thickness; it has been worked to some extent by the New Jersey Zinc Company. A late examination of this ore by Professors J. D. Dana and B. Silliman, Jr., shows it to be composed of 46 to 48 per cent of Franklinite, the rest being mainly red oxyd of zinc, yield-

ing, exclusively of the zinc in the Franklinite, 26 per cent of the oxyd of zinc. As has been already stated, the New Jersey Zinc Company, after extracting the zinc in the shape of the white oxyd from the ores of Stirling and Mine hills, smelt the residuum, consisting almost wholly of Franklinite, into iron. Attempts had been made many years since by some of the iron works in the neighborhood to smelt the Franklinite ore which appeared in such large masses and so easy to be mined; but none of these early operations proved successful, owing, no doubt, to the great quantity of zinc in the ore, which, in the process of volatilization, absorbs a large amount of heat, and thereby tends to chill the furnace. Early in 1853 Mr. E. Post, of Stanhope, N. J., undertook to work the ore with anthracite in one of the blast furnaces at Stanhope, and succeeded in making some pig-iron of excellent quality; but these operations were soon discontinued. In the same year Mr. C. E. Detmold successfully and permanently established the manufacture of iron from the zinc and Franklinite ores at the works of the New Jersey Zinc Company (of which he was then president), by smelting the residuum, after the zinc had been driven off, for the purpose of making the white oxyd. This branch of industry promises to become one of much importance, as the iron produced from this residuum not only yields a bar iron of remarkable purity, fiber and strength, but is especially suited to the manufacture of steel. The furnace in which this iron is made is 18 feet high and 8½ feet diameter of bosh; it produces annually about 2,000 tons, and works uninterruptedly with very great regularity. The pig-iron produced is almost identical in character, appearance and structure with the best lamellar iron made of the famous spathic ores of Siegen and Musen in Germany. Its fracture shows large and brilliant silver-white lamellar facets, sometimes beautifully crystallized, and so hard as to cut glass; these crystals are not attracted by the magnet.

As we have witnessed some of the operations of making oxyd of zinc and pig-iron from this mineral, at the works of the New Jersey Zinc Company, near Newark, we will add to the above a brief account of the processes.

The Franklinite ore, after being broken into small pieces by stampers, is placed in a number of small furnaces which have open hearths below to admit plenty of air, but the products of combustion are carried off, above, in pipes, to a large adjacent building, where there are a large number of porous bags connected with the smoke-pipes. As the zinc is volatile when raised to an elevated temperature, it escapes up the smoke-pipes, combining with its equivalent of oxygen, and forms protoxyd (ZnO) of zinc. A draft produced by a steam-engine draws the gases from the furnace through the porous bags, leaving the oxyd behind in them, in the form of a white down, almost resembling snow-flakes. The gases of zinc are of yellow color when highly heated at the top of the fires; but when the oxyd is cooled by its long circuit through the pipes into the receiving bags, it assumes a white appearance. The oxyd of zinc thus obtained is afterwards thoroughly mixed in mills with oil, and forms the beautiful paint now much used for inside house-work.

The iron oxyd which is left behind as residuum in the furnaces, is taken and smelted in a proper iron furnace, as described in the foregoing. It requires a strong blast to smelt iron ore; the temperature in the zinc furnaces is too low for this purpose.

INTERESTING POSTAL DECISION.

The following gallant letter from Hon. Joseph Holt, late Commissioner of Patents, and now Postmaster-general of the United States, covers a decision of a question as interesting as it is novel. A husband who had been separated from his wife, demanded that the village postmaster should deliver her letters to him, and threatened a suit of law if his demand was not complied with. The wife, on the other hand, forbade the delivery of her letters to her husband. In these circumstances, the postmaster appealed to Mr. Holt for instructions. That gentleman pronounces the claim advanced by the husband too preposterous to be seriously refuted—indeed, he says it is as abhorrent to law as it is to the Christian civilization of the age. We give Mr. Holt's letter in full:—

POST OFFICE DEPARTMENT, NOV. 30, 1859.

SIR:—In yours of the 23d inst. you ask for instructions in regard to the delivery of letters to a wife who is separated from her husband, but is not divorced; and you state that the husband claims all the letters addressed to her, and will commence a prosecution if his claim is not allowed, while the wife forbids that he shall be permitted to receive them.

The precise question raised by this state of facts has

never before been presented to this department, which affords gratifying proof that there is no prevailing disposition on the part of American husbands to enlist the support of the postal authorities, in endeavors to intercept and violate the correspondence of their wives. In taking this step he has, no doubt, proceeded upon the mistaken assumption that, because of her legal identity with himself for certain purposes, these letters are therefore his absolute property, and he has a right to control the postmaster in their delivery. When a husband becomes estranged from his wife and abandons her, or by his neglect or cruelties compels her to abandon him, it would be as revolting to humanity, as subversive of sound morals, to suffer him to cut off her communication with those relatives and friends to whom in her hour of trial she might be driven to look for sustenance, or for that consolation which she might need even more than food or raiment. It has long since been adjudged, both in England and Scotland, that even after letters have reached the possession of those to whom they were directed, their writer has still such a property in them as will enable him to maintain an injunction to prevent their publication. *A fortiori*, does this interest exist when the letters, like those under consideration, are *in transitu*? This principle seems to be declared in the Act of Congress, which requires that all non-delivered letters, containing valuables, shall, with their contents, be returned to the writers, whose proprietorship in them could scarcely thereafter be controverted. The department, both in the transportation and delivery of letters, acts as the agent of the writers, from whose "warrant of attorney," as found in the superscription upon them, neither the counsel nor the command of the husband, nor of anybody else—under such circumstances as are here presented—will justify a departure. What state of facts would authorize a revocation or modification of this warrant of attorney by the writers themselves, it is unnecessary to discuss, inasmuch as it is not pretended, in this instance, that any such revocation has been made. If only such letters can be delivered to the wife as the husband may formally sanction, it would equally follow that none could be safely carried in the mails, written by her, without a like assent first obtained—a doctrine too preposterous to be seriously refuted. The husband, in this case, seems to have supposed that he has the same property in the thoughts and sympathies of his wife—though no longer a member of his household—and of her friends, that he has in her goods and chattels. This view of marital power might well find a place in the code of the Grand Turk, and would possibly be submitted to in his harem, but is repugnant to the teachings of American jurisprudence. While, in legal contemplation, the wife's existence is to a degree merged in that of the husband, it is also true that her individuality is for many purposes conceded and defined, and that she has rights secured to her not only independent of, but in defiance of the will of her liege lord. She is legally and morally responsible, apart from him, and has necessarily guaranteed to her that freedom of thought and the interchange of thought, sought in this instance to be denied her, but without which the imposition of such responsibility would be an arbitrary and remorseless despotism. Hence it may be safely held that the jealous and heartless espionage attempted to be exercised by this husband over the correspondence of his wife, from whom he is separated, is as abhorrent to law as it is to the Christian civilization of the age, which recognizes woman as the companion of man, but not his slave.

You are therefore instructed to deliver the letters in question to the lady to whom they are addressed.

J. HOLT, Postmaster-general.

THE GREAT METEOR OF NOV. 15, 1859.

The officers of the Smithsonian Institute have undertaken to investigate this brilliant phenomenon, and have issued an invitation to all observers to forward a full description of it as seen by them, stating particularly the time and the point of disappearance. There is no doubt that this body of learned men will prepare a memoir on the subject, of the most reliable, full, and satisfactory character, and it is safest to postpone any inferences until the appearance of that memoir. From all the statements collected to the present time, it seems probable that the meteor threw off masses of matter over New York, and finally exploded and came to the earth in the neighborhood of Delaware Bay.