A close analysis might show a slight but not material difference When taken hold of by the present successful company, the design was to manufacture the zinc of Commerce, zinc ware, &c., but early experiments by the company led to the discovery that a more immediately marketable, profitable and beneficial article could be made—to wit: the zinc paints, now so rapidly supplanting lead and other paints. It was found that a pure and brilliant white sub-oxide could be extracted from the ore with great ease and facility, and two shades of white, one a silver white, and the other a beautiful slate color; while the red oxide could be pulverized in the ore, and rendered into a brilliant brown paint, which, in turn, by admixture with other preparations, would also make a superior black paint. Here was a new field indeed. The known poisonous and other deleterious properties of lead, seemed to define the mission of the Zinc Company, and to demand that it should first become a creator of a healthful and more durable and brilliant, as well as a cheaper paint. They accepted the summons, and erected extensive zinc paint works at Newark, after long and expensive, but never discouraging experiments, and during ten months of 1852—the first year of comparatively perfected machinery and operation—their paint sales from their warehouse in this city—supervised by Messrs. Manning and Squier, 45 Dey-street—reached $185,577 28, and they were, even at that, unable to meet the press of orders, though their works at Newark turned out ten tons of paints per day. Those works are being enlarged, and will require repeated extension, if, as we think it is, zinc is destined to supplant lead as a paint; for there is now annually consumed by the United States, 50,000 tons of lead in paints.

A glance at the process of making zinc paint, or rather extracting the sub-oxide, will not be uninteresting. The mines are about thirty-five miles from Newark, and the ore requires at present to be carted eight miles, (a rail is being laid for this transport in future,) and is then conveyed to the paint works by water. The ore, on arriving at the works at Newark, is placed in heaps and roasted, for the purpose of softening it. It is then ground into small pieces, when it is mixed with an equal quantity of coal, used for de-oxidizing the different substances of which the ore is composed. It is then put in smelting furnaces, where the action of the carbonic acid gas, supplied through the coal, disengages the component parts of the ore, and causes the zinc to rise in vapor, which vapor is conveyed into a large tube, thro' which a quantity of atmosphere is constantly driven, and the zinc, uniting with the oxygen, produces the white oxide of zinc, and this is driven by a blast into a collecting chamber, from whence it is taken for use. The oxide is then mixed with oil by means of machinery, and thus is produced the beautiful white zinc paint. The manganese in connection with the zinc, is found to be, as though specially provided, a natural dryer for the paint.

When the Zinc Company commenced operations, they had comparatively no data to go by. The zinc paint introduced in France by the discoveries of Le Clair and Sorel—for which they were awarded the cross of the Legion of Honor and other dignities—though subsequent to the use of a perhaps inferior article, collected through some experiments (not for that purpose) many years since, and used on the mansion of the late Hon. Samuel Fowler, of New Jersey, then proprietor of the zinc mines; being manufactured by a double process, first resolving the zinc (carbonate) to metal, and then extracting the oxide, gave little benefit to the American enterprise. But the Zinc Company had an indomitable man in James L. Curtis, formerly an extensive merchant of our City, at its head, assisted by able coadjutors, and he knew no such word as fail. Collecting at home and abroad such data as could be had, he made Yankee invention, science, and skill, answer for the necessary balance, and the result has been a perfection and simplification in the operations of mining and manufacture of zinc not excelled, if equalled, in the world. Yet the company will doubtless add improvements from time to time, for there would seem to be no limit to the inventive capacity of Americans. The advantages of zinc over lead as a paint are these:—Repeated tests make 60 pounds of zinc white equal to 100 pounds of lead in covering surface, and the relative cheapness, therefore, stands:—

100 pounds best lead, say 7½ cents per pound - - - - - -	$7 50
60 pounds best zinc, say 9 cents per pound - - - - - -	5 40
In favor of zinc - - - - - - - - - - - - - -	$2 10

The superior cheapness of zinc is the great commercial advantage in its favor over lead. Besides this, zinc is superior in whiteness, brilliancy, and durability, and is entirely free from the poisons in lead which generate several diseases, well known to workers in lead, painters, tenants of freshly painted rooms, and medical men. The white zinc resists the action of all gases that yellow and tarnish lead, and holds brilliant as an inside paint for years. In color, it compares with lead as porcelain white does with common earthen white. It can be used with impunity while rooms are occupied, while medical men—vide the evidence in Tanquerel's octavo work on lead poisons and lead diseases—agree that lead painted rooms should not be tenanted under two or three months for safety. The zinc colors, for outside painting, requiring but little oil, dry suddenly, and form a metallic coating on wood, brick, iron, &c., impervious to weather and salt-water, and are more nearly fire-proof than any other paint known.

They act galvanically on metal surfaces. We have before us at this writing the testimony of the Supervisor of the New York and New Haven Railroad, the Superintendent of the Navy Yard at Gosport, Virginia, a special committee of the Common Council of this city—zinc paint has been tested and ordered by the Common Council for the use of the city buildings—and other eminent parties, many of them practical painters and users of lead all their lives, who have tested the zinc paints on railroad depôts, locomotives, ships, buildings and otherwise, and their testimony is unanimous—without considering the sanitary reason—in favor of zinc over lead. To our mind, the sanitary reason is the greatest of all in favor of zinc. But though the present operations of the Zinc Company are confined to the manufacture of paints, this is but a branch of the prospective interest. Lead is a poisoner, not only in paint but in water-pipes, roofing, cistern-lining, &c., for all of which uses zinc is a cheaper, better, more durable, and healthful substitute. Slightly alloyed with copper, it makes a sheathing for ships much cheaper and far more durable than copper, because impervious to the corrosive action of salt water. Manufactured into culinary ware, covers, spoons, forks, etc., zinc (the New Jersey) makes an article more durable and beautiful than Britannia or nickel, while the strength of the metal will allow it to be made much lighter. We can see, not far ahead, a vast manufacturing interest on these accounts springing up around the zinc mines of New Jersey.

The Franklinite, where that is the chief deposit—and the Zinc Co., have, as already intimated, chief deposits both of Franklinite and zinc—bears the following analysis, made by Dr. Jackson:

Silica, (si. 03) - - - - - - - - - - - - - -	0.299
Franklinite, (Fe. 203)- - - - - - - - - - - -	66.072
Zinc, (zn. 0) - - - - - - - - - - - - - -	21.395
Manganese, (mn. 03) - - - - - - - - - - - -	12.242
	100

The admixture of zinc with the Franklinite is found to destroy its tendency (if it otherwise had any,) to granularize, and renders it thoroughly fibrous, making it when properly worked into iron, the toughest and strongest that has ever been tested. According to Tredgold's test, the Franklinite stands thus:—

Best Swedish bar iron, inch square bore - - - lbs.	72.840
Inferior " " " - - - -	53.224
Best English " " - - - -	61.660
Inferior " " " - - - -	55.000
American Franklinite " - - - -	77.000

It has been tested in this city and in Baltimore with similar results, and a French test, in the Government Marine Forges at Paris, made the difference in favor of Franklinite much greater. We have seen it variously tested, every species of trial only adding to the proofs of its wonderful nerve and strength. Wire of whatever size, made of other iron, is flawed and broken at a few twists, but we have seen wire made from the Franklinite twisted twenty times without inducing a flaw. Resolved to steel, it makes an article of the most brilliant character. Competent judges—our most extensive and practical iron and steel workers—accord a superior value to Franklinite, over any other iron for uses requiring the greatest toughness and strength. For steam machinery, suspension bridges, wires and such lesser forms of iron as require a union of delicacy and strength, the Franklinite must be, as soon as placed before the public, in great demand. It forms an admirable alloy or emollient with inferior iron and ores, changing their hard granular nature into ductility and strength. The residuum formed in the furnaces of the zinc paint works, from the per cent of Franklinite discharged, is admirable for admixture with inferior iron; retaining as it does, just enough zinc to neutralize the granular character of such iron. It is beginning to be largely sought and used for that purpose, and for fluxing iron in the process of puddling. It may seem a matter of surprise that an iron ore so near the seaboard and the chief market and mart of capital of the Union, and with such a character, should not have been long ago developed. The same surprise may be expressed over the zinc. Repeated trials for half a century have been made with both minerals, but through lack of practical knowledge, inefficient operatives, and the little interest taken in encouraging mineral enterprises, they all failed, until the energy, genius, and tact of Col. Curtis and his coadjutors, took hold of the work.

The chief credit of the successful operations of the New Jersey Zinc Company, forming an era in American mineral history, is acknowledged to belong to Col. Curtis. He had the faith and boldness to take a matter of "repeated failures" in hand, and allowed no discouragement to daunt him.