

before, the other after ) it might well give occasion to think it was depending on the *Æquinox*,

Moreover, the curious *Reader* may be pleased to compare this Account with that, which was given concerning the *Tydes* observed at *Plymouth*, *Numb.* 33. p. 633. and to take notice, that the difference of the *Day-tyde* from the *Night-tyde*, agrees in both, (of which the reason may be considered;) but, as to the difference of the increase and decrease of the *Water* about *Bristol* from what *Mr. Coleprests* observed at *Plymouth*, that may much depend upon the position of the places; that of *Plymouth* being out to the *Sea*, this near *Bristol* being on the *Severn* far within *Land*.

Whilst the *Reader* is comparing this Information; with that of the lately cited N<sup>o</sup>. 33. he will meet there pag. 633. in the last line, with the word *perpetual*, which he is desired to change into *proportional*; which indeed should have been intimated much sooner.

#### Ex Extract

*Of a Narrative, made by an Ingenious English Gentleman, now residing at Sevil, concerning his Voyage from Spain to Mexico, and of the Minerals of that kingdom.*

TO pass by many curious Observations touching the *Vegetable* and *Animal Sphere*, (which I reserve for another occasion) I shall now entertain you only with some of the Observables, I meet with about *Minerals* in the kingdom of *Mexico* whither I travell'd A. 1664. under the Character of a *Biscainer*, by the recommendation of a friend in the same Ship, that carried thither a *New Vice-roy of Mexico*, remaining in that Country almost two years in continual studies and researches; especially about *Minerals* and their Generation, Separation, &c.

And indeed Nature hath so prodigally enriched this Country with all sorts of *Minerals*, both perfect, imperfect and mixt that she almost overwhelms the Observation of the most diligent and most curious *Naturalists*, I have dealt with the skilfullest *Miners* in those parts, but I found them to know of, and care for little in the matter of *Minerals*, but *Gold* and *Silver*. Some of them shew'd

shew'd me certain Stones, gathered in great abundance in the Mines of *Tasco*, which they would have to be *Amethyfts*, by which they said that certain *Flemings* had got much money.

I was once desired to visit a famous Cave there, some Leagues from *Mexico* on the North-west side of the City beyond the Lake. This was said to be gilded all over with a kind of leaf-gold, which had deluded many *Spaniards* with its promising Colour, they never having been able to reduce it into a body, neither by Quick-silver nor Fusion; though the fame ran, that the ancient *Indians* knew how to make use of it, and that the great *Montezuma* had borrowed thence a considerable part of his Treasure. I rid thither one morning, taking with me one *Indian* on'y for my guide, with a Tinder-box and a Candle, and some other instruments for my design, I found it situated somewhat high, in a place very convenient for generation of Mettals; but the mouth so barricaded with stones, that both my *Indian* and I had work enough to clear the passage for my entrance, which being open'd, I went in with my Candle lightned, but could not make the *Indian* follow me, being afraid of Spirits and Hobgoblins. The light of the Candle soon discover'd to me on all sides, but especially above my head, a glistering Canopy of the said Mineral Leaves; at which I greedily stretching forth my hand to reach some parcels of it, there fell down presently so great a lump of clotted sand on my head and shoulders, that not only it put out my Candle, but my eyes also. And calling out with a loud voice to my *Indian*, who remain'd at the mouth of the Entry, there rebounded within those hollow Caverns such thundring and redoubled Eccho's, that I admired it, and the *Indian* imagining by those Tumultuous voices, that I was wrestling with some infernal Ghosts, soon quitted his station, and thereby left a free passage for some rayes of light to enter, and to serve me for a better Guide: My sight mean while being not a little indangered by the corrosive acrimony of that Mineral dust. Having got my Candle lighted again, I proceeded in the Cave, and heaped together a quantity of the mineral mixt with sand, and scraped also from the superficies of the Earth, a quantity of the same kind of glittering leaves; none of which exceed the bredth of a mans nail, and with the least handling they

they divide themselves into many lesser spangles, as with a little rubbing they leave one's hand all gilded over like gold.

I knew well enough, that the ordinary Tryals made by the *Indians*, had proved fruitless upon this Mineral; for it could neither be reduced into a massy form by the violence of fire, nor separated from its heterogeneous substances by the mild tryal of Quick-silver, yet on the Touch-stone it equalized the most refined gold; so that there wanted nothing but to reduce it to a fusible and malleable metallick Form; which soon would be accomplished, if it could be made to take Quick-silver.

Considering with my self, what might be the reasons of its refusing Mercury, and being not ignorant, that some of the choicest Mines of Silver and Gold, are almost of the like nature, till the impediments are remov'd, which are certain mineral viscosities, that sometimes by their oleaginous fatness, and at other times by a fretting acrimony, hinder the ingress of the Mercury; I conceiv'd, the like might happen in this case. Whereupon, to find a cure for this disease, I began first to make experiment on the sand, which had been the *matrix* of the Mineral; and there I tryed first the ordinary way used in the *Indies* on such occasions, which was, to observe the colour of the fumes, yielded from the spangled sand in a strong reverberating fire; but here could little be observed, by reason of the adust drying of the sand, not able to afford any visible fumes; fit for such a discovery. Likewise I proceeded to another way, to boyl it in water, and having powred that off, to observe the *Alkali*, left after the waters evaporation, I by this means discover'd, that it abounded rather in sulphureous unctuousness, than saline acrimony; or else I think; my eyes in the Cave had run a greater hazard. Finding this, I applyed first the Quick-silver, mingled with the ordinary Magistrals (as they call them) used in that Country, to curb and break the force of these sulphureous impediments. But perceiving these to be of no effect, I encourag'd the Quick-silver with the *Caput mortuum* of Vitriol and Salt-peter, (kept as a secret among the chiefeft Mine-men) but with as little signs of the Mercury's operation as before. Then I boyled my mixture over the  
fire,

fire, a way found out in *Peru* in such difficult cases; but all to no purpose; so froward a matter it was, that it could not be brought to receive Mercury, neither by fair means, nor by foul. Then I devised a way to torment it with a Corrosive of ordinary separating water, impregnated with common salt, and it made a dissolution, like that of Gold; which, thus dissolved, I shew'd to a Mineralist, who had been versed all his life time in the separatory Art of Gold and Silver; and he would not believe but that it was true gold. But having steam'd away the *Aqua fortis*, I found my hopes turn'd into a dirt something yellow, out of which, with distill'd vinegar, enforc'd with its own tartareous Salt, I extracted a Tincture more curious, rhan useful.

The said Mineralist would not despair yet, but taking a quantity of the golden dust, he cemented it with the powder of vulgar sulphur, *stratum super stratum*, and this in a moderate fire for three days together, hoping, the Sulphur would consume all the impediments, which kept the Mercury from entring. But (as I told him before-hand) it only serv'd to clog the matter with more sulphureous unctuosity, than it had before.

I brought for a curiosity some of this Mineral from the *Indies* into *Spain*, where some of our friends had a view of it; but have not been able hitherto, to do any good upon it. What I learnt by these Tryals, was not only Caution, but several secrets of extracting Mettals by Quick-silver; in which there are so many Cautions and observations, that it would require much writing to rehearse them.

I shall only subjoyn the grand use of Mercury in separating Silver in the *Indies*, when that Mettal is generated (as commonly 'tis) in certain rocky stones, abounding with bituminous and corrosive mixtures, so as 'tis impossible to free it totally from its corrupt *Matrix* by the violent way of melting, whatever auxiliary Ingredients may be added, as Lead and artificial salts, and the like, because those sulphureous and vitriolick compounds, (in the way of fusion) melting together with the Silver, sublime part of it away in a volatile fume by their corroding acrimony; calcinating and vitrifying th'other part, and robbing the Artificer of half his gain. In this case the use of Quick-silver is found most advantageous; the practise whereof, because I am  
of

Fig. I.

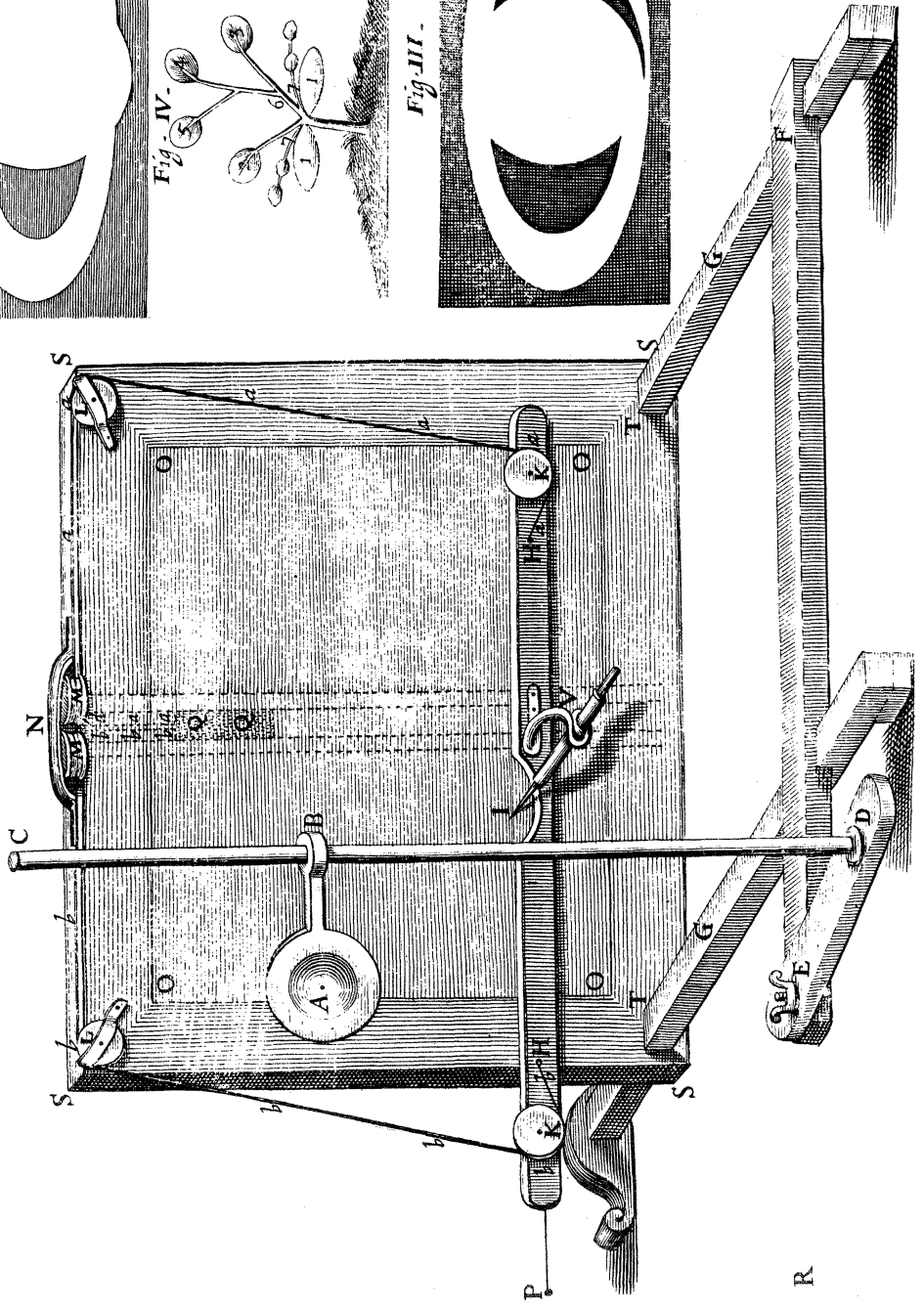


Fig. II.

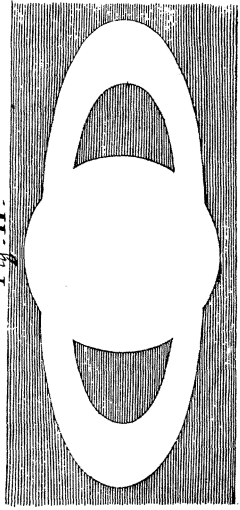


Fig. IV.

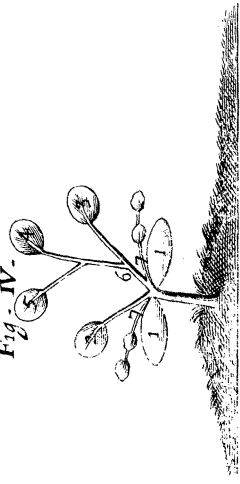
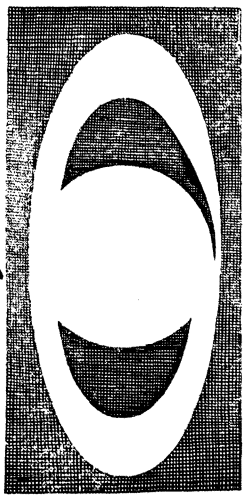


Fig. III.



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of opinion, 'tis not perfectly known, I shall here declare, as briefly as I can.

Having reduc'd the Ore into small stones, they calcine it first in a reverberating Oven, yet with a moderate fire, for fear of fusion, and driving away into the air part of the treasure, the volatile parts being by nature not perfectly mixt *per minima* with the fixt, as they afterwards come to be by industry and Art. And I have heard some of the more intelligent Mineralists say, that they judge their metallick labors and operations, to be many times not so much a reaping of silver ready made, as a kind of artificial compounding, and bettering of that, which nature had left dispers'd and imperfect. This Calcination serves chiefly to free the Mineral from many infirmities, that hinder the operation of the Quick-silver; and it serves also to discover, by the color of the fumes it yields, what corrosive mixture chiefly abounds in it, besides that it renders the one more tractable and plyant under the Mill-stone, which is to reduce it to a small flower before the application of the *Mercury*. This is chiefly observed in those Silver-veins, that are of so hard and dry complexion, yet those which are usually more soft, abounding in oleaginous Sulphures, before burning are first ground into powder in such Mills as I have often seen in Glass-houses: and then they receive a gentle calcination, the Mineralist mingling therewith Ingredients suitable to the peccant humour, if I may so speak, of the Ore. As if, (e. g.) the metall be sulphureous and antimonial, Rust and dross of Iron is found to be an excellent cure of this distemper: if Martial, and abounding in Iron, then Sulphur and Antimony reduced to powder, is used as a convenient remedy for that disease. Sulphur hath a particular force, as I have found by experiment, to soften and dissolve Iron. But not only in this operation of Calcining, but also in applying the Quick-silver, there are so many different cases, in which different remedies are to be used, as there are Silver veins of several constitutions; of which elsewhere.

The Ore being ground, calcin'd, and curiously sifted, they divide it in several heaps, and then by lesser Essays, they find out how much silver is contained in every heap; where 'tis very ordinary to find only 6. ounces in 100. pounds; sometimes 12; but if it yield 18. 'tis esteem'd a very rich vein: yet sometimes there are great Masses found all of pure silver, which is call'd *Virgin-metall*.

Having discovered the quantity of silver contain'd in each heap, then proportionably they besprinkle them with quick-silver, and that not all at once, but at several times; stirring the Ore up and down. Then according to the diseases already discovered in the Vein by the fumes in the calcination, or according to any new symptoms, appearing in the operation of the quick-silver, convenient remedies are apply'd, if (e. g.) the *Mercury* give signes of being *tocado* (as they call it) i. e. if it appear

mortified, not in small and clear spherical figures (which is a good prognostick) but in the form of long worms of a wan, pale, dark and leadish colour, then sick *Mercury* is easily cur'd of the worms (as they speak) by certain Magistrals, so called, that are diversly compounded, but have for their *basis* or master ingredient calcin'd Copper mingled with Salt. These worms indicate, that the Mineral abounds with Lead and Pewter, which overcharging the stomach (thus they carry on the Metaphor) of *Mercury*, hinder his appetite to the silver; in which case, those Copper-Magistrals with their vitriolick force consume and destroy this impediment.

The heaps of the Ore being thus mingled with Quick-silver, they are often stirr'd about, the better to incorporate it with the silver. I find, they have none but conjectural signes to know, when the Mercury hath intirely perform'd its office in separating all the silver from those heterogeneous substances, the uncertainty whereof occasions often very great losses, especially when they work about Gold: for in passing the right time, the greatest part of the Gold flies away in a fume, because, to borrow the reason of Chymists, *Summa volatilis superat summam fixi*; or rather because Nature hath not yet accomplisht the perfect composition and proportionate mixture of the volatile Elements with the fixt: which defect is supply'd by Art in this extraction by *Mercury*, in whose bosom the parts are combin'd together in small Atoms, and also by gentle fires, succeeded by violent ones, whose activity is assisted by Ingredients, fit for a fusible and easie fusion, and so curbing the volatile parts, that by an exquisite proportion they enter a perpetual amity with the fixt.

When by the colour of the *Mercury*, coagulated by the silver in clear massy lumps, they conjecture the work done, they wash it by means of three vessels, standing in order one under the other; so that the matter in the first and highest vessel being washed and stirred about with a Molinet, all the dust of the heterogeneous Minerals, that imbody not with the *Mercury*, is carried away together with the water into the other Vessels, and from thence quite thrown out by the continual current of the water; whereas in the mean while the silver in clotted lumps, called *pellas*, is by the weight of the Mercury depressed down to the bottom of the said tubbe.

This lavatory work being ended, the Mercury with the silver is taken out of the Vessels, and diligently squeezed in course and strong linnen, and even with stroaks of a beetle, the Quick-silver is separated, as much as may be, from the Silver. And this mass is afterwards reduced in molds of the shape of the Indian Pine-apple, into a pyramidal or conical figure, which they call *Pineas de plata*, thus fashion'd for the easier placing them round about the ridges of a great earthen vessel, of the form of a blind Alembick; round about the top of which, a fire being made, all the rest

of the *Mercury* forthwith abandons the silver, and falls to the bottom, from whence it is recover'd, and kept for the like use.

Lastly, The silver is melted down with the *Liga*, (as'tis call'd) which the King of *Spain* allows, by which He returns to the people in Copper that fifth part, which they allow him of all the silver.

Having described this whole operation, you will perhaps expect, I should somewhat enlarge here upon the generation of Metals, and my speculations and theory concerning it. But, though this was indeed one of the chief motives of my undertaking this long and tedious Voyage, yet considering the subject to be of such a nature, that it requires very many things to be supposed and premised, and more experience, than I yet dare pretend to, and I dare not at present engulf myself in this Ocean. I shall only say this; first, that my opinion of this matter is something different from the ordinary, though I will not deny, that for the substance, I differ not much from the opinion of the famous *Sendivogius*, in *libro de 12. Tractatibus*. And then that I think it observable, that there is a very strong offensive smell, ranker then that of Sepulchers, which I have observed in some Mines, the Work-men telling me, that that is one of the chief signes of a rich Mine.

To conclude, I shall presume to give you some of my thoughts concerning the so much discoursed of *Transmutation of Metals*; concerning which, I am of opinion, that that Change is erroneously apprehended by many, imagining that the whole imperfect metal is totally transform'd into the more perfect by the substance mixed with it; whereas the mixture added to the melted metal, joyns it self, (as I conceive) to those parts, which being homogeneal, symbolize together with the nature of the more perfect, whereby the pure metalline parts are separated from the other heterogeneal impure Sulphures, which together, with other causes, did hinder nature in the Mine from concocting that substance into the perfecter Metal.

That which contributed not a little to make me a Profelyte to the Art of Chymistry, was, among others, a very pretty experiment, a friend shew'd me, more curious than gain-full; It was a continual budding forth of silver in the form of a branch in a glass over an indifferent strong fire of Coals, which sprouts being clipp'd off with Scissers, and a small supply of crude *Mercury* added to the matter, in a small time there arose another branch of true silver, which had sucked and converted into metallick sprigs a considerable portion of the Quick-silver. This motion, and the increment of new silver-branches ceased not, as long as the fire continued, and fresh *Mercury* applyed for the due nutriment of this mineral Vegetation. This ingenious Knack made me reflect on the golden Tree of *Virgil*. 6. *Æneid*.

== *Primo*



—*Primo avulso non deficit alter  
Aureus, & simili frondescit virga metallo.*

The whole complex of Ingredients is known to consist only of vulgar *Aqua fortis* (abstracted from two parts of *Vitriol*, and one of *Salt-peter*) and *Quick-silver*, and a small quantity of *Silver*, far less than you may reap in a small time from those *Silver-sprigs*; yet gain there is none, there being more expences blown away into smoak by continuance of fire in one month, than can be recover'd from this *Silver-harvest* in a longer time. And though this seem but a toy, yet 'tis very Philosophical, much informing the understanding, however it enrich not the purse. For here we see crude *Mercury* manifestly turn'd into *Silver*, notwithstanding 'tis deny'd by so many.

*So far this generous Observer* for this time; with the last part of whose relations may be compared *Numb. 39. p. 779, 780.* 'Tis hop'd, that hereafter more particulars of this Curious Traveller, concerning both the Subject, he hath here begun to discourse of, and others of a Philosophical nature, will be further comunicated by him.

#### *An Account*

*Of some particulars, referring to those of Jamaica, Numb. 27. and 36, Communicated by Mr. Norwood the younger, an Eye-witness.*

1. **A** *Llegators* are shap'd like *Lizzards*, being four footed they walk with their *Belly* at distance from the ground, like *Lizzards*. Those of a full growth, have *Teeth* like a *Mastiff*, and a *Mouth* of  $1\frac{1}{4}$  foot wide. They are of so strong a scent, that you may smell them at a pretty distance, when they lie on the land. They may be master'd and kill'd by any, dextrous and skill'd in the way of doing it, which is, that a Man be arm'd with a good long *Tronchion*, and fall upon them side-ways; for doing it front-ways, they are too nimble for the assailant, and may, by leaping upon him, (which they can do the length of their whole *Body*) spoil him: but if he lay his *Club* on them against their *shoulder*, and behind their *fore-feet*, and lunge them there, the beast being thereby rendred unable to move, is easily subdued.

2. *Tortoises*, if their blood be heated, they dye, and if they shall live, their blood must not be hotter, than the *Element*, they live in.

3. The *Chego's*, described by *Ligon*, are not felt to have got in o the body, till a week after. They will breed in great numbers, and shut themselves