

**ALEMBIC CLUB REPRINTS. - NO. 11.
ESSAYS OF DOCTOR OF MEDICINE ON
AN ENQUIRY INTO THE CAUSE
WHEREFORE TIN AND LEAD INCREASE
IN WEIGHT ON CALCINATION**

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Alembic Club Reprints. - No. 11. Essays of Doctor of Medicine on an Enquiry Into the Cause Wherefore Tin and Lead Increase in Weight on Calcination by Jean Rey

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JEAN REY

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Glembe Club Reprints—No. 11.

ESSAYS OF JEAN REY,
DOCTOR OF MEDICINE,

ON AN ENQUIRY INTO THE
CAUSE WHEREFORE TIN
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(1630.)

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PREFACE.

THE title of the work which has here been translated is "*Essays de Jean Rey, docteur en médecine, sur la Recherche de la cause pour laquelle l'Estain et le Plomb augmentent de poids quand on les calcine.*" It was first published in pamphlet form at Bazas in 1630, and reprinted, along with notes and various letters bearing on the subject, at Paris in 1777. In these Essays Rey attributed the increase in weight of tin and other metals on calcination to the action of the air, thus to some extent anticipating the work of Lavoisier a century and a half later. He evidently well understood the value of properly chosen experiments, although he himself seems to have been little disposed to their performance, delighting rather in metaphysical speculations and curiously inadequate trains of reasoning, which yet lead often enough to just conclusions. Apart altogether from the historical interest of the work, the quaint and lively style of the author makes his Essays still worthy of perusal in the original.

J. W.

ESSAYS OF JEAN REY,

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ATION.

PREFACE.

Some eminent personages having observed with astonishment that tin and lead increase in weight when they are calcined, have been seized with a praiseworthy desire to enquire into the cause of this phenomenon. It has proved a goodly subject, but the enquiry has been troublesome, and its fruits very small: in so far that after having directed their thoughts to all quarters, they have only been able to adduce reasons so feeble that no man of sound judgment dares trust them for support, or by their aid shelter his mind from all doubt. The sieur Brun, Master Apothecary in Bergerac, having lately paid attention to this augmentation, and believing, as I apprehend, that no one before him had been aware of it, has invited me in one of his letters to enter on this line of thought and furnish him with the cause. Now, since he is a person whose integrity of life, rare experience in his art, and other patent virtues, oblige every honest man to wish him well, I confess that these qualities have had such

power over my affections, that I cannot deny him this request. At his prayer, therefore, and friendly solicitation, I have devoted several hours to the question, and conceiving to have hit the mark I produce from them these Essays of mine. Not without foreseeing very clearly that I shall incur at first the accusation of temerity, since in them I run counter to sundry maxims approved for many centuries by the majority of philosophers. But what temerity can there be in exposing the truth to light of day when one has known it? Might I not more justly be reputed childishly fearful if I dared not divulge it, and sordidly envious if I held it concealed? Of the last two accusations I clear myself, hoping to see myself freed of the first by all intelligent persons, who, after having tasted of my reasons, will, if they find them to their liking, be grateful to me for having set them forth: and, if they like them not, will not refrain from praising my efforts to seek the truth in so arduous a question, and will be incited by my example to treat the matter more dextrously, to which I invite them. In any case I shall have testified to the public the desire I have of serving it by letting this paper slip from my hands, although it may be that some hurtful stigma will thereby be graven on my reputation.

ESSAY I.

*That all things material under the canopy of Heaven
are heavy.*

God, in creating the Universe, has made it neither wholly like himself nor wholly unlike: for, himself being One, he has made the world as it were not-One, by the diverse multiplicity of its innumerable parts; willing at the same time that they should reunite to a certain oneness by their exact contiguity. The superior world is

beyond our subject: the inferior and elementary world owes this contiguity to the heaviness divinely impressed in all its parts, assisted by the subtle fluidity of some of its simple bodies. It is through this quality, with which the matter of the four elements is more or less invested, that they are separated from each other and kept each in his own place, according to the requirements of the generation of mixtures and the adornment of the universe. For this matter, filling at every point the space enclosed beneath the vault of heaven, is continually urged by its own weight towards the centre. It is true that the earth as heaviest promptly occupies this place, and forces his brethren to retreat, so that water, being second in heaviness, is also second in place: the air then, being driven from the first and second place, is restricted to the third, leaving to fire, the least heavy of all, the uppermost region for his dwelling. Chemists furnish us with an agreeable representation of this when they take pulverised black enamel, liquor of tartar, *aqua vite* coloured bluish with litmus, and spirit of turpentine reddened with alkali; and, casting the whole into a phial, agitate it until a confused mixture results. The vessel being then left in repose, the eye perceives with pleasure the process of disentanglement. The enamel reaches the bottom, representing to us the earth. The liquor of tartar is its neighbour, representing water. The *aqua vite*, resembling the air, occupies the third place. And the spirit of turpentine, to demonstrate the fire, assumes the highest position. All this occurs in virtue of heaviness, according as it is liberally or sparingly distributed in these bodies. In the same way the elements can acknowledge no other cause to arrange and dispose them in their places, there being no need to introduce the lightness which our predecessors have vainly excogitated to this end.

ESSAY II.

There is nothing light in Nature.

Almost all philosophers, ancient as well as modern, fearing an eternal confusion of the elements if they were all endowed with heaviness, have been led to adopt the belief that the two superior elements are equipped with a certain lightness whereby they raise themselves upwards to occupy each his place; and that the two lower elements are dragged downwards by their own heaviness. But having in the preceding Essay clearly shown that there is no need of lightness to effect this, heaviness alone being sufficient, I embrace the maxim which they themselves have very prudently put forward, "That we must never multiply the causes of things without necessity," and holding as assured that God and Nature do nothing in vain (as they also teach us), I believe that it would be otherwise if lightness were admitted, since it is superfluous. But that is not all. Fire is by nature so subtle that it scarcely merits the name of substance, and is consequently denuded of wellnigh all power of resistance, whence it follows that the air mounting upwards without hindrance would reach the heavens, expelling the fire from its place, and constraining it to seek a lower seat, to the detriment of their own doctrine. To this I add another difficulty, namely, the perpetual and fruitless strife which would exist betwixt the heavy and the light elements, the latter pulling upwards and the former downwards with all their strength. From this would arise at the place of their contact a state of tension incomparably greater than that of a cord pulled at both ends by two powerful hands, imposing upon it such a strain that rupture is seen to ensue. Such a state is very far removed from that bond of friendship by which Nature has sought to join neighbouring elements, em-