Of the principles and operations of Chymistry.

This Art has been much improved, but not reduced to the rules of true philosophy. The three or as others will have it, the five principles of Paracelsus, the Alkali and Acid of Tachenius are not openly acknowledged by modern Chymists, though they mean the same thing in other terms. Mr. Boyle the next among our English Philosophers to the great Bacon, has thrown some light into this Art, but has not placed it so much on a new foundations as ~~that Lord has~~ thrown down the old. So that Mr. John Keil has the honour of first illustrating it by Mechanical principles.

We shall endeavour on these principles to explain the primary operations of this Art. and

1st Explain the particular operations as they are naturally connected with each other, and by what mechanical force they are principally produced, and to what uses they chiefly serve,

2dly The different methods they can be performed.

3dly The particular Experiments in their proper places, and reduce them to the general Theory.

To make it easier we will borrow certain Lemma's and Postulata's from Geometry and Natural Philosophy.

„1. All similar bodies are in a triplicate ratio
„of their homologous sides, and therefore Spheres
„are in a triplicate ratio of their diameters, or
„are as the cubes of their diameters.
„Also in similar bodies that are of the same
„density their weights are as the cubes of their
„diameters, but their superficies are in a
„duplicate ratio of their diameters.
„2. The momentum of Bodies, or the quantity
„of motion, are in a ratio compounded of the
„quantity of matter, and their celerity.
3. „If a ~~body~~ be specifically heavier than the
„fluid, into which it is immersed, it descends
„with ~~the~~ force, ~~which answers~~ equal to the excess
„of its gravity; but if it be lighter than the
„fluid it is carried upwards with the force
„equal to the excess of the gravity of the fluid
„~~which the body is wanting of the gravity of the fluid~~
„~~the gravity of the fluid~~
4. „That ~~there~~ is an Attractive force, or
„that all the parts of matter are drawn towards
„one another.
5. „This force ~~does not operate~~ is not of great extent, nor is it
„sensible till the particles of matter draw
„nearer one to the other, but at the point
„of contact it is strongest, consequently
„the Attractive force decreases in a ratio
„of the increasing distances, which is more
„than duplicate.
„6. This force is different according to the
„various texture and density of the
„particles; but the gravity remains the
„same however the texture of bodies
„is changed.
„7. The attractive force is greater on
„one side of the near particle than
„~~the~~ the other.

~~4. The more minute particles of the~~

6. Particles approach each other with the greater velocity in proportion to the smallness of their size. For the attractive force exerts itself only in those particles which are near one another, as for instance in d. and dc. The force of such as are remote is reckon'd to nothing. Therefore no greater force is required to move the bodies A and B. than what would put the motion the particles d, and dc. when disengaged from the rest. But the Velocities of bodies moving with the same force are reciprocally as the bodies themselves. Therefore the more the body A exceeds the particle d. in magnitude, the less is its velocity, and this motion is so languid that it is often overcome by the circumambient medium, and other bodies. Hence it is that this Attractive force does scarce exert itself, unless in the smallest particles seperated from the rest.

7. The force by which particles cohere arises from attraction, and is changed according to the various quantity of contact.

Having premised these Mathematical propositions, we will proceed to explain the Doctrines of Chymistry which may be distributed into two general Classes, Diaeresis or Dissociation; and Synaeresis or Composition; the chief of the first class are calcination, distillation, and sublimation; of the second fermentation, digestion, extraction, precipitation, and Crystallization.

(A. 4) (d. 2)