your method of philoſophizing, which proceeds upon actual obſervation, makes a collection of facts, and concludes no farther than thoſe facts will warrant. In my preſent circumſtances, that mode of ſtudying the nature of this globe is out of my power, and therefore I have permitted myſelf to wander a little in the wilds of fancy. With greate ſteem I have the honour to be, &c.

P. S. I have heard that chemiſts can by their art decompoſe ſtone and wood, extracting a conſiderable quantity of water from the one, and air from the other. It ſeems natural to conclude from this, that water and air were ingredients in their original compoſition. For men cannot make new matter of any kind. In the ſame manner may we not ſuppoſe, that when we conſume combuſtibles of all kinds, and produce heat or light, we do not create that heat or light; but only decompoſe a ſubſtance which received it originally as a part of its compoſition? Heat may thus be conſidered as originally in a fluid ſtate, but, attracted by organized bodies in their growth, becomes a part of the ſolid. Beſides this, I can conceive that in the firſt aſſemblage of the particles of which this earth is compoſed each brought its portion of the looſe heat that had been connected with it, and the whole when preſſed together produced the internal fire which ſtill ſubſiſts.

N°. II.

A new and curious Theory of Light and Heat; in a letter from Dr. B. Franklin to David Rittenhouſe, Eſq.

Read June 20, 1788. UNIVERSAL ſpace, as far as we know of it, ſeems to be filled with a ſubtil fluid, whoſe motion, or vibration, is called light. This

This fluid may poſſibly be the ſame with that which being attracted by and entering into other more ſolid matter, dilates the ſubſtance, by ſeparating the conſtituent particles and ſo rendering ſome ſolids fluid, and maintaining the fluidity of others; of which fluid when our bodies are totally deprived, they are ſaid to be frozen; when they have a proper quantity, they are in health, and fit to perform all their functions; it is then called natural heat; when too much, it is called fever; and when forced into the body in too great a quantity from without, it gives pain by ſeparating and deſtroying the fleſh, and is then called burning; and the fluid ſo entering and acting is called fire.

While organized bodies, animal or vegetable, are augmenting in growth, or are ſupplying their continual waſte, is not this done by attracting and conſolidating this fluid, called fire, ſo as to form of it a part of their ſubſtance; and is it not a ſeparation of the parts of ſuch ſubſtance, which diſſolving its ſolid ſtate, ſets that ſubtil fluid at liberty, when it again makes its appearance as fire?

For the power of man relative to matter, ſeems limited to the ſeparating or mixing the various kinds of it, or changing its form and appearance by different compoſitions of it; but does not extend to the making or creating of new matter, or annihilating the old: thus if fire be an original element or kind of matter, its quantity is fixed and permanent in the univerſe. We cannot deſtroy any part of it, or make addition to it. We can only ſeparate it from that which confines it, and ſo ſet it at liberty, as when we put wood in a ſituation to be burnt; or transfer it from one ſolid to another, as when we make lime by burning ſtone, a part of the fire diſlodged from the fuel being left in the ſtone. May not this fluid when at liberty be capable of penetrating and entering into all bodies, organized or not: quitting eaſily in totality thoſe not organized, and quitting

quitting eaſily in part thoſe which are; the part aſſumed and fixed remaining till the body is diſſolved?

Is it not this fluid which keeps aſunder the particles of air, permitting them to approach, or ſeparating them more in proportion as its quantity is diminiſhed or augmented?

Is it not the greater gravity of the particles of air, which forces the particles of this fluid to mount with the matters to which it is attached as ſmoke or vapour?

Does it not ſeem to have a great affinity with water, ſince it will quit a ſolid to unite with that fluid, and go off with it in vapour; leaving the ſolid cold to the touch, and the degree meaſurable by the thermometer?

The vapour riſes attached to this fluid, but at a certain height they ſeparate, and the vapour deſcends in rain retaining but little of it, in ſnow or hail leſs. What becomes of that fluid? Does it riſe above our atmoſphere, and mix with the univerſal maſs of the ſame kind?

Or does a ſpherical ſhell or ſtratum of it, denſer, as leſs mixed with air, attracted by this globe, and repelled or puſhed up only to a certain height from its ſurface by the greater weight of air, remain there ſurrounding the globe and proceeding with it round the ſun?

In ſuch caſe, as there may be a continuity or communication of this fluid through the air quite down to the earth, is it not by the vibrations given to it by the ſun that light appears to us; and may it not be, that every one of the infinitely ſmall vibrations, ſtriking common matter with a certain force, enters its ſubſtance, is held there by attraction, and augmented by ſucceeding vibrations, till the matter has received as much as their force can drive into it?

Is it not thus that the ſurface of this globe is continually heated by ſuch repeated vibrations in the day, and cooled by the eſcape of the heat when thoſe vibrations are diſcontinued in the night, or intercepted and reflected by clouds?

Is

Is it not thus that fire is amaſſed and makes the greateſt part of the ſubſtance of combuſtible bodies?

Perhaps when this globe was firſt formed and its original particles took their place at certain diſtances from the centre in proportion to their greater or leſs gravity, the fluid fire attracted towards that centre might in great part be obliged, as lighteſt, to take place above the reſt, and thus form the ſphere of fire above ſuppoſed; which would afterwards be continually diminiſhing by the ſubſtance it afforded to organized bodies, and the quantity reſtored to it again by the burning or other ſeparating of the parts of thoſe bodies?

Is not the natural heat of animals thus produced by ſeparating in digeſtion the parts of food, and ſetting their fire at liberty?

Is it not this ſphere of fire which kindles the wandering globes that ſometimes paſs through it in our courſe round the ſun, have their ſurface kindled by it, and burſt when their included air is greatly rarefied by the heat on their burning ſurface?

May it not have been from ſuch conſiderations that the ancient philoſophers ſuppoſed a ſphere of fire to exiſt above the air of our atmoſphere?

N°. III.

Deſcription of the proceſs to be obſerved in making large ſheets of paper in the Chineſe manner, with one ſmooth ſurface. Communicated by Dr. B. FRANKLIN.

Read June 20, 1788.

IN Europe to have a large ſurface of paper connected together and ſmooth on one ſide, the following operations are performed.

1. A number of ſmall ſheets are to be made ſeparately.

2. Theſe