— Echo's are retarded with
wind against the current of
air — Strong wind = 1 mile in 10
— Single finger —
— Continued — 12 ft. second
Door — Ratchet wheel —
+ All can feel nearly alike —
— same with regard to light
— reason of both —
Repeated sounds — Echos
— Board in water — in air
— Echos = 100 distinct
+ Cause of an Echo different
bodies reflecting sound to
the same point —
— Sound repeated from bodies
placed at different distances
repeated from two parallel
walls — Mr J. Stuart at
Greenock —
— Echo near Edin. —

— Echo from the air — sound from a cloud — ill founded — focus — Madura —
— Euler Lambert &c. maintain that sound moves only in straight lines, and adduce Echos as a proof L In := L Re —
— But an Echo will happen if the sum of the lines from the diff: surfaces incident and to the final point be equal —
— Ellipses it is the most perfect — sound in one focus reflected to the other — Circle — end of the diameter — greatly in the center —
+ The Diff: between the sums of the two lines and the Dist between must not be less than 127 feet —

— St. Paul's —
— Parlies aile — 40, 30. 20
— Concave mirror — reason
— Tube — Reason of augm.n
+ Speaking trumpet —
— figure — Theory —
— Whisper — Figure —
+ Ear — passage — figure Tympanum — Experiment with Dogs —
— Pitch fork in air applied to an elastic body — a rod —
+ Guns at Carr —
— Great bells —
—

Sound high and low
acute and grave —
+ No foundation in Nature
Quakers reason — Eye —
— Two persons singing
assend by certain fixed
steps — Concords & discords
same in all countries —
+ Octave —
+ Natural scale —
— Leaps not equal
Tones — Semitones
— Major — Minor 80. 81

$\frac{8}{9}$ Ma. $\frac{9}{10}$ Min.

$\frac{15}{16}$ Semitone —

— Indivisible —

— Strings —
3 Proportions —
Length — Diam. — Tension —

+ 1 : 2 = Octave
2 : 3 = 5th
3 : 4 = 4th
4 : 5 = 3rd greater
5 : 6 = 3 less

Tonic

Low D German flute
= 120 vibrations fo = Sun

+ Ear only judge of Mus —
+ Written Music —
— Treble — Bass — Tenor
— Alto — Mezzo

Stringed Instruments —
— Harpsichords — Spinnets
— Temperament —
— 30 lbs. = Tension —
— Bigger allow — Heat —

— Violin
most perfect Instrument
— Strings tuned 5th — coming
17 Notes without a Shift —
— Strings unequal in weight
Bass covered with Metal —
— Effect of a Mute —
+ Some fortunate auth —
Eolian Harp —
— Partial Vibration —
Three Notes from the same
string ± no Antipathy
+ Great bells — fundamental
Tone — Shrillness —
+ Organ the most perfect
Regd Instrument —
+ Musical Glasses —
— More water deeper tone

Miscellaneous Obs
— Sympathetic Tones —
— Harmonic — Tones —
+ Throat — Stoller gave the
Idea of the Flute —
+ Octaves in the Flute
produced by a double
velocity of wind
+ Two Concords and a dis-
cord are sounded — Discord
left behind —
+ Pitch fork applied to
the tongues —

XL loads are now
by the m

XL Coach are nice numbers
by the motion of sound

12/1142/95
100
62

7

Inflam. Balloons

This Ball. is filled with inf.
air & fixed air but does not con-
dense like water rarif. air.
This fluid is produced in great
is lack the nt. and size of balloon
depend on the size of the Ball.
Chief objection to the lead Cata-
is the expense
It is necessary to confine
the inflamm. air as no addition
can be made to it in the air
the weight of the materials
being to great.
Silk must be oil'd & var-
nished — The best varnish
is the common oil — Elastic
gum has been tried but now
laid aside —

greater distance.

The manner sound &c
ame the reason why sounds
e heard farther on a plain
an a hilly country, at sea
an on land &c ——

— Great bell not heard
a great distance, altho' heard
the distance of
several miles in hilly country —
sound moves at the rate of
feet in a second or ten
ish mile in 4.6 seconds
all sounds move equally fast
— gentlest whisper as fast
the roar of a cannon —
sounds are accelerated or re-
ded according as they move
th or against the wind.
ngle pipes :: 13 C. second.
rake continued sound ——
door grating on its hinges
machine with a ratchet
heel and fly

It is very remarkable that all ears feel continued sound at the same ~~time~~ instant of time —

There is a similar fact in vision — which is called sound

Any impression made by means of the senses on the brain takes some time to wear off — &c —

When a wave of air or sound strikes — a fixed surface it is reflected hence the noise &c

When the reflecting surface is at a sufficient distance that is not less than 100 feet then the reflected sound will not arrive till the original sound ceases, in this case the reflected sound is called an echo —

Several curious circumstances respecting echoes —

— Sometimes the same sound is frequently repeated — This happens when there are several reflecting surfaces at distances either on the same or opposite sides of the center of sound — There is a remarkable instance of this at Sir John Stewart's house at Grenoch. Two pavilions front each other at the distance of about 100 feet. A sound excited at one is repeated three ~~times~~ or four times from the other when the sound is sent from the middle point between the pavilions thus double the no of reflections in the same space time

There is an echo in the neigh
of this city which repeats a line
of Virgil —

Some figures such as the circle
and oval greatly augment sound
— Whispering Gallery of St Paul's
— Aisle of Paisley Abbey —
more astounding than St. Pa
~~It consists~~ of one apart.
about long and high
The side walls almost stone the
roof an arch ~~the on~~ a large
window in each end one of
them built up, the door im-
mediately below the other. The
floor flaged ~~and~~ one end cause
about feet above the other
— Sound continues 4 or 5 seconds
is strong and general at first
but ends in a most enchanting
shake —

An oval room has this property that any sound excited in one focus is reflected from every part of the surface and concentrates in the other. —
The concert hall of this City is an example of this —
A concave mirror will reflect and augment sound.
A tube will convey sound to a great distance. I have heard a whisper distinctly thro' a tube 60 feet long. and 1 Inch Diam
I say a whisper for the voice could not have been heard thro' ten feet of the same tube
For, order to hear thro' a tube the ear must be applied close to the end of the tube, if the sound is to be distance beyond the tube the farther end must

be endeared. The seaman took
advantage of this and constructed
the speaking trumpet, the
form of which has been gradually
improved and is now perhaps
as perfect as the simplicity of
the instrument will admit of

Paulo Crawford Theory

A Magnetic axis is necessary

Atmospheric air
supports animal life and flam
Phosphorus
Air in which animals have
respired or inflam.d substanc
have burnt out is noxious
Expt of the bottle —
Doctor Crawfords Theory
Stagnant air is noxious

There is a succession of sounds which excite agreeable sensations —

Something in our constitution —

Sounds may be compared together either with respect to the pitch or tone — or with respect to strength —

Acute — Grave

a boy's voice more acute or higher than a man's —

The distinction of high and low has no foundation in the nature of sounds — the Greeks called their grave sounds the higher — probably because the strings of their lyre were extremest —

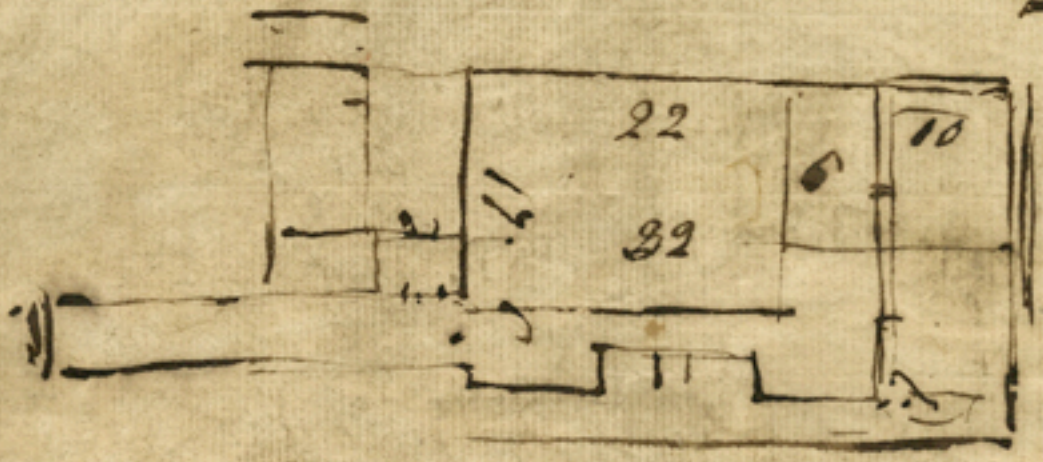
Which represented to the eye
by five par. lines & spaces —
Degrees of sound shewn by
certain characters on these lines
and the spaces — higher sounds
placed uppermost —
A certain number of steps
& degrees of sound constitute
the Natural scale —
Steps not all equal —
Tones — Semitones —
First note indefinent —
all the rest bear a certain
relation to it —
Key note 2 : 3 : 4 : 5 : 6 : 7 : 8
Key and 8 the same —
octave — 7 notes —

To find the semitones they
being known —
— Semitones below the
key and above the third —
the key must be kept in mind
in view — Roughman — in
the middle of a tune —
natural Expectation —
To find the key note —
Last note of the best the
key note —
two tones and a semitone
above the key — sharps
one tone and a semitone
flat semit —
Greater and less third
Different effects —

Natural Keys - C. Sharps
A flat —
In transposed keys of the
note below the key be sha
or the fourth above be flat
it is of the sharp series —
Minium flat —

Three octaves 11 lines
more than a single voice
Bass lowest — Treble high
Clefs Bass F. on the fourth
line — Tenor C. on the own
line
Treble Clefs G on the the
second line

me of flats and sharps
for transposition —


22
22
6
10

Balloon

A balloon may be defined a large bag or case filled with a light substance which floats in the Atmosphere.

A body floats in a fluid when it is lighter than its equal bulk of the fluid

E.G. Cork in water, lead on Mercury, smoke in air heated air in cold air —

If the balloon ~~and~~ is equal in weight to its bulk of Atmospheric air it will just float. If lighter it will take up a weight equal to the difference

A ball: which will just float at the surface will not ascend higher on acct. of the gravitation

about $\frac{1}{3}$ of the Diameter of
neck —
Bread straw cork shavings
or any other fuel that burns
clear and fierce without smoke
will serve to inflate it. —
— To ascend higher the fire is
increased &c —
Inflation —

Power of Ascension difficult
to be ascertained —
In large balls it is probable
that the rarefied air is not
more than twice as light
as comm. air — whereas inf.
air is ten time lighter —

A. a Bank of Stone = 40 or 45

B. The current of air round a candle upwards prevents the sound of a Drum of passing it —

C. Suppose Magnetism to be a fluid and to move in any one direction then the attraction and repulsion may be accounted for

D. If the weight of a body is less than the atmosphere of the feathers of a fluid then the body will swim on the fluid tho' specifically heavier —

The Bishop of Lincoln
said in his Sermon preached
before the Princess Sophia
that he had read some
where that a body had
remained under water
and he I am not mistaken
under the ice for 6
weeks and was recovered
and I believe it possible

A cat is swimming
and is fighting the ducks
cats up a bit of turf
and puts the cat's head
into the cat's and he
recovers — half an hour

the principles. Horace describes the man who first ventured out to sea as having oak and triple plate of brass about his breast, but what would he have said of the man who first ventured up into the atmosphere in a element 800 times lighter than that of water and consequently proportionally less fit to support him.

The air is that fine transparent fluid body which surrounds the globe of the earth. It partakes both of the annual and diurnal motion and extends from every point of its surface to the height of about fifty miles, with this fluid we are perpetually surrounded we are every moment drawing it into our lungs and its variation in spring and fall are greatly affect our health and spirits to become acquainted with its principal properties is surely an object well deserving our attention.

1. Air perfectly transparent
therefore invisible, seldom
found pure, water salts
and a variety of other matter
mixed with it, these can be
separated by both artificial
and natural processes.

2. Weight of the Atmosphere
varies – ascertained by the
Barr: and thermometer –

3. Air is a compressible
fluid. – Flame of wood
first then metals equal to
all above proved by the
Barr.

4 Condensed – rarefied and
spring – Air pump –

5. Pressure of the Atmosphere
1 Receiver on the pump plate
2 Bladder – concave –
3. Hemispheres – contain the
pressure in quantity – 12 lbs
on every circumf. inch 15
on every square inch. –
On a man's body 25,000 lbs
Why does not this pressure
crush him to death? Because
the spring of the air within
is a counterbal. for the pressure
without.

6. Air Extracted from beer
– From Beer – not paid air
– particles of the beer & latter
fellow came along with
the air hence the head

when the experiment is
tried with water the air is
extricated in globules but no
head is formed because the par-
ticles of water have but little
attraction for each other —
— Air Extracted from an
egg — bulk increased — Shell
porous — hence the cause of
eggs spoiling so soon. to
preserve them rub them over
with butter, fresh &c.
7. Spring of the air. —
— Bladder — Air Gun —
Heat enlarges the bulk of
air — but a body burning
in air till it is extinguished
diminishes the bulk of air
— burnt paper in a tube cap-

8. Bell in Vacuo —
Air is the medium of sound
when there is either no air or
no circulation of air there
can be no sound —
Sounds are propagated in
~~water~~ air like waves in
water — Velocity of sound
1142 feet P. second — All
sounds move equally fast
sounds retarded by an
opposing and accelerated by
a consenting wind —
— Sounds Dimin; on the tops
of mountains increased in
the diving bell. A Gun
discharged on mount Etna gave
a report like a shot in
a door — French horn at —

Gun Exp. Bridge in p. 6

Imagined to be sounded in the diving bell had almost rent the drums of the ears.

Echos are sounds reflected from some surface at a proper distance — Every sound makes an impression on the ear which requires some time to wear off. If therefore the reflected sound arrives at the ear before the original impression is worn off there is no echo — To produce an echo the reflecting surface must be at least 60 feet distant.

A good ear cannot distinguish single pulses of sound which succeed each other at the rate of 12 or more in one second and it is remarkable that

how different soever people can may be with respect to music they all agree nearly in this point in finding continued sound at the same instant — A door grating on its hinges a quill moved over a comb are examples — There is similar fact in vision — A torch whirled round with a certain velocity appears single, increase the velocity and instead of a single torch you have a complete circle of fire. The circle becomes complete at the same instant to a number of spectators. From this many curious consequences

The low D of a German flute
concert pitch is unison with
a string which performs 120
vib.s in a second —
In the Æolian harp several
sounds from the same string —
all concords. — Octave, fifth
and third —

Diving Bell.

Indians knew a tub over
their shoulder with proper
weights hung to it to make
it sink and descend to a
considerable depth in water
But as air which becomes
fast through the lungs
of an animal is unfit for
respiration they soon found
it necessary to come up for
a fresh supply — Doctor
Halley first contrived a method
of sending down fresh air
to the diver, he also enlarged
the vessel and gave it a more
convenient form — called it the
Diving Bell —

Description of the Diving Bell

The Bell has been made of different materials based in the last it is composed of staves like a cask, strongly bound with iron hoops. To the lower ends of the bell are hung a number of weights to make it sink in water. The weight of the whole must be greater than the weight of its bulk of water in order to its sinking. The weights must be so distributed as to make the Bell sink in a perpendicular direction, and the mouth consequently close with the water all at the same time to prevent the escape of the air, as is proved by this experiment, received in a line in the water, air escapes. Glass windows are placed in the side and top of the bell to give light, Divers sit on a cross bench or rope most convenient so that he is with half the body in the water, by this means he breathes the cool air near the surface of the water and also displaces by his air from the bell, and consequently the Diver can remain longer without a fresh supply.

one great inconvenience
attending Doctor Halley's
Bell is that the Ascent and
Descent of the Bell depends
entirely on the people above. A
yard arm or some other
projecting part of the vessel
may intercept and cover
the bell in its Descent,
before notice could be given
to the people above Doctor
Halley having no other sig-
nals than writing a few
words on a slate of lead —
To remedy these inconveniences
the late Mr. Spalding contrived
two methods by either of which

he could raise or lower the
Bell at pleasure independent
of the people above. One
of these is so easy and sim-
ple that it is surprising it
should not have occurred
to Halley or any other per-
son who had made the
Bell the subject of his in-
vestigation — It was this.
The weights being round the
mouth of the Bell could near
by sinking the Bell, an additional
weight was suspended to the
center of the Bell which
with the weights on the outside of the Bell
would readily sink it — when

This balance weight was either put on or taken off the Bell would sink or swim alternately — The other method was by making a division in the upper part of the Bell which would hold two Cwt. of water, by means of two stop cocks the Chamber could be filled either with water or air and consequently the Bell render near two Cwt. heavier or lighter —

There are two things requisite for the case of the Diver, to let out the heated air and receive a supply of fresh air from above — The vitiated air is let out by a stop cock placed in the crown of the Bell which the Diver opens occasionally when the air rushes with violently to the surface, the water will not descend because it finds an easier passage in to the Bell below —

Air Barrel Description of it — Simple contrivance

Signals

Mr. Spalding contrived to make signals by lines reaching from the lower part of the bell to the Deck of the vessel from which the bell is suspended — added signal for all well — — Cork balls —

— Process of Diving

The bell is slung from the Bowsprit yard arm or any other part properly secured. The Diver gets into the bell, and when the bell comes near the surface of the water he takes his seat. The first thing remarkable to the great increase of sound in the bell, the Diver startles at his own voice — A gentle tap equal to the blow of a mallet — The bell should be let down slow a barrel of air at 5 or 10 feet. The Diver now begins to feel a pain in the ear the

increases as he descends
at 25 or 30 feet the pain
is excessive and sometimes
occasions a discharge of blood
from the ears — At about 33
feet the diver feels a sudden
shock or crack in the ears
which is alarming at the
first sight, but instead of
the Tympanum of the ear
being broken as the diver
suspects, he finds the pain
instantly removed, and is
perfectly at his ease. The
presence of the condensed air
in the bell against the Drum

of the ear occasions the pain
There is a communication between
the mouth and the cavity behind
the Tympanum by means
of what Anatomists call the
Eustachian tube, when the
air in the bell and consequently
in the mouth of the diver arrives
at a certain degree of condensation
it forces open this tube enters
in behind the Tympt and becomes
a counterbalance for the pressure
on the out side, the Tympt is
by this means reduced to
its natural state and
the pain consequently
removed. A sketch being made
of time the diver remains

at this depth he feels no more of the pain. But if he descends deeper the pain is renewed and at about 60 feet a second shock takes place. There is generally light enough for the diver to do any work — The cold at the bottom disag.ᵗ this may be remedied by lessening several folds of flannel round that part of the body immersed — Cause —

— It is prudent never to turn the stopcock, except when the barrel of fresh air is at hand to supply the place of that let out —

Use of the Diving Bell

To lift a wreck either in whole or in part — Fishing for coral — Examining the bottoms of men of war. — Bottoms of rivers for laying the foundation of bridges — The Diving cannot with any degree of safety leave the Bell

PR

Mr Spalding's death

owing to a fatal concurrence of circumstances — Current wound round the bell-signal could not be perceived — Why did not he drop the balance weight? the bell would have run out — Much owing to the confusion of the people above the crafts that they saw air bubbles up like the current warned down should not they then have drawn up the bell? — I now regret any thing so much as my not having been present at this Experiment I offered to go with Mr Spalding to the wreck which was about 18 miles from Dublin

Lectures on Atc. air —

Resistance

1. Bladder — 2 Syringe —

3 Pewing bell. — 4 Projectiles —

Weights

5. Flesh (Contents ascertained) —

— 14½ Grains = 2 lb a equal of water —

Bar. and Therm. must be attended to —

~~4.~~ Pressure —

6. Reason of the Thermometer reasoning —

— Why does not the air burst the vessels? Thesis —

7. Bladder broken —

— upset of a Gun —
— Glass window — Cotton —

8. Hemispheres — Magdeburgh
— quantity of pressure —
— Body = 30,000 lb —
— Fish in water — on Land

9. Bellows — Capillary tube
— Microscope —

10. Mercurial Cup —
— Elasticity — Definition

11. Bladder — Single —

12. Bladder — Lead weights. —

13. Wood 14. Water 15 Beer —

16. Egg 17. Egg Membrane

18 Fountain by pressure

19. Fountain by Spring —

20. No Suction — +

21. Bauhus — +

22. Balloon —

23. Guinea and feather +

24. Light and heavy body +

25. Barometer + —

26. Air Gun. + —

27. Bell — +

28. Burned air +

29. Smoke descends in Vacuo +

30. Fish cannot sink —

31. Animal in Vacuo —

~~32. Burned air Eat Chesnut~~

33. ~~Wood injected with Mercury~~

Observations

+ Height of the Atmosphere ascertained two ways — Twilight — Barometer —

+ — Atmosphere extends to a great height — Meteors — 1783. very high — sparks noise — No lower in atm.

+ 45 miles may be the height to which vapours ascend — Vapours probably cause the refraction —

+ 13. why wood is lighter than water — why the lightest woods after being soaked in water sink in it —

— Method of injecting wood with mercury —

— If the Atmosphere be just sufficient to condense one Atmosphere be thrown in, same power to support then as then is wanting: If the Atmosphere be first exhausted it will require double weight &c.

— Breathing — Sucking —

— History of the Barom. — Plumber at Florence wanted to raise water by a sucking pump to 50 or 60 feet — failed — applied to Galileo — Galileo answer of a Vac: why one height more or less? to Gali: said that the Power was limited to 33 feet —

— Gal: had discovered the weight of the air, remarkable why not the pressure — Doctrine of Aristotle prevailed —

— Torricelli put 60 then 60 feet

— at length Mercury — 29½
cause pressure of the air —
+ one tet aside — fell lower! —
Pascal's letter in 1647
to his brother & Law Mr Perier
recommended him to try the
Experiment at different altitude
— reasoning — predicted the con-
sequence —
+ Different barometer —
+ by the air pump the pressure
of the atmosphere is diminished
with much trouble than ascending
a mountain —
+ In determining the height
of the atmosphere by Barometer
the Refraction must be taken
to account L = 17° 30′

Air pump —
— Common — cannot produce
a perfect vacuum — reason
— Torricelli's pressure on the
upper valve removed —
— Prince's lower valve removed
— Haas — near the cogitator
left the lower valve by a
mechanical contrivance —

— Analogy —
S, 81° 15′ : Semid : : R : Hypothe
from which deduct Radius then
remains the height of the
atmosphere — or
Rad : Semid : : Sec 18° 45′ : Hypo

— Mulia described by Dr Halley 1719. = 70 miles
Explosion heard over all great Britain — divid
Light —
— Bauchers — both bladder and tube may act —
— Elect.y does not remove the difficulty — pale light thro' rarefied air —
— Queen Elizabeth — motive to prohibit the use of pit coal — noxious, particularly to persons from the country —
— Ocean Gauge — Short — long tube —

— Vapour upon fire water oil Leather — when the pressure is lessened — hence the disagreement between the pieces, and other Gauges —
— Rain most accurate —
— Squirrel for the air pump
— Small pits at Calcutta

— Sounds — Echo 127 feet

$= \frac{114^2}{9}$ some say $\frac{114^2}{12} = 95$ feet

— Elliptic — figure

— Tympanum — St. Paul's

—

Chem: Scraps

M Dwell and Nugent

Journal 1799 - No 1

Observations on Dr. Priestley's exps.

— Atmosphere composed of two perfectly elastic fluids of very different and opposite qualities the one &c —

These two gases are not chemically united, but exist merely in a state of intimate mixture or combination. They are consequently easily separated by a substance which possesses an attraction for either — Ex: Great Pure nitre in close vess: heat something below boiling — and oxygen

between two, seems an additional weight, equal to a quantity of air which has dephlogisticated the air is changed from a bad to a gas — candle extinguished — mercury — red powder exposed to a red heat = air lost. —

the red powder becomes mercury revivified and the air produced is pure air Eudiometer —

— Mercury has therefore the power of decomposing Atm: air and uniting to the oxygen — Say by this the proportions but not accurately on account of the attn of Ox: G. to the principle of heat (caloric) and partly on account of the attraction between

between the constituent parts of Atm: air —

— 1 Vol.m of Nitrous gas with a jar of Atm: air inverted in water, will continue for two or three days to decompose the air in the jar. but in the atmosphere cases, the remaining air is pure azote, and is about 27 parts of a 100 or 27.73 the proportn. between the oxygen gas and azote of our Atm air

If this azote be mixed with the air from the red precipitate in the above experiment, atm: air will be produced. Thus is both Analytic and Synthetic:

Dr Priestley — In all cases
of what is called the Phlogistication
of air there is an emission of
something from the substance
which the antiphlogistication ~~takes~~
takes place to act by simple ab-
sorption — There is phlogiston
which uniting with oxygen
Gas forms with it part of the
azote formed after the process

Experiments on the Carbon been
heated by a burning Glass in
At: a. in a recipient — The
results of the whole gave two
smells a proportion of Ox: G.

Exp: with pulverised nitre
gave also two bulks ox: tho'
more than the bones.

— before the needles were heated
over time water a black crust
was formed on it, but there
was not such a precipitation
of the Iron as with the bones

Reply

In all the cases of demonstration
of the air by the black bones,
a quantity of carbonic acid was
produced by the union of the car-
bon contained in them with the
ox: of the At: a. The loss in the wt
of the bones and the precipitation
which took place were time
which prove this fully, and it
is probable that Dr. P. was
not careful to separate this
Gas from the phlogisticated air
which was wanted, which would

comparatively escape detection — if the employed the Retorts are in a test of the purity. The opinion is strengthened by two results — namely 15 parts in 100 15.75 in a 100 and 19.4 in a 100. —

As to the exp. with the Steel tube — Carbon is a constituent part of Steel — hence the Carb: a. formed when they are heated. Thus while one portion of the Ox: of the At: a united with the Carbon of the Steel to form Carb: a which was in part absorbed by the water, another portion united with the iron to form which was by that means partially oxydated and received a small addition of weight

The Phlogisticated air ~~was~~ produced after the process is what would originally in the At: a. employed — The additional q.ty of Phlo: air in Dr. P. Priestly is formed by the union of part: of the Ox: G. of the At: a. with the Phl: emitted from the bones. —

Repeated by the following Experiment. A piece of black bone which had been burnt in an intense heat, to the pieces of a burning lens in a receiver filled with air and half filled with pure Ox: Gas expelling by gentle heat from Ox: Mer: of Red ash. The Vol: of the air

was increased by heat and after it had been diffused the cast it appeared somewhat augmented. Having withdrawn the tube that was occasioned a solution of Caustic Potash was introduced under the receiver, which absorbed nearly nine tenths of the whole gas which therefore consisted of carbonic acid. The remainder, on examination, was found O_2 gas. — After such unequivocal proof that CO_2 O_2 is not unoxygenated nor produced in the other instances, and

indeed it appears strange to us that the union of what is termed phlogiston with O_2 should at one time generate fixed air, and at another oxygen, without any apparent cause for such a capricious result. —

Dr Priestley alledges that the Phlogistication of Nitrous acid is owing to some cause in its entering something, and not to its parting with something according to Ant. Dr. This is evident he thinks from its becoming phlogisticated by entering Nitrous air

Cons ac

Let us examine into the constituent principles of nitrous and see if we cannot prove this change paradox true that Nitrous acid by mutiliating Nitrous air loses oxygen. —

Azote combined with oxygen in the prop: of one to two forms Nitrous Gas; which not being saturated with Ox: seeks it with avidity from the Atmosphere. The further addition of Oxygen converts it (the azote) into a powerful acid. When the prop.n of ~~azote to ox~~ oxygen to azote, says Lavoisier, is below 3 parts of the former to 1 of the latter, the Nitrous air when 4 of Ox to 1 azote the product is Nitric acid this proportion is not upon mere fixed &c — Thus Nitric acid is the acid of Nitre saturated with Oxy.n; and Nitrous acid is the acid of Nitre saturated with azote, or, what is the same thing, Nitrous Gas, and this latter is azote, not sufficiently saturated with oxygen to possess the properties of an acid. — Nothing can be more easily explained according to these principles, than the

Nitrogen water of Nitrous and by mixing Nitrous can
fix fresh portions of azote be-
cause a fresh measure
which is equivalent to the
subtraction of a fraction of
the other constituent part or
Oxygen. This confirms the
accuracy of M. Dumas in
stating that the fixed of
Nitrous acid is always ob-
served by its passing with
Nitrogen — A mixture
of Oxygen Gas & Hydrog: G
kept 3 months over Mer-
cury exploded with the
same force as usual —

Oct. 8th regarding the Ab
sorption: Hydro we found can-
not be owing to want of
Dew moisture. expt: It
is difficult for a man to
abandon opinions which
he has been the first to
promulgate — opinions founded
on a train of ~~Expts~~ Recondite the most
brilliant, perhaps, ever made
by one individual in the
science of Chemistry. Yet from
Dr. D. we can expect every
thing. a thorough acquaintance
with his works, with convinc-
ing one that he is not
the slave of Hypothesis;
and that influenced by facts
he has more than once
recanted his own opinions,

The Temp: of a lb of ice or snow at 32 mixed with a lb of water at 172 and Temp: of the mixture being 32 proves that Caloric may unite with bodies in considerable quantity without producing any change in their temp: but their forms are in this combination necessarily changed

Dr Dobie Presents his Theories of Chemistry Medical and Philosophical Journal March 1799 &c —

6. At a vauxhall, two young
writers named a well known
woman of the town and one
or two of her sisters to the Vauxhall
and placed them in a very
conspicuous seat fitted up as
is supposed, purposely for Lady
Anstruther, placing themselves
beside the ladies — The proprietor
who is a rich and respectable
native remonstrated with the
gentlemen but in vain. At
last he ordered the constables
to turn the women out —

Next evening upwards of
forty students assembled at the
home, but the constables, one

so severely that his life was in danger. The Constable commenced an action against a few of the Gentlemen, they took on to bribe him with a considerable sum to drop the action. — The Gentlemen however were severely reprimanded by the Chief Justice.

7. The inland duties, it is said were laid on to support the College they being in Eleven Laws and the College expence amount, it is said but to three, so that the Company gain three laws.