Vol. 4

Alex. Anderson Esq
of Bountie

~~614~~. Every six bottles of Port wine it is said contains one of brandy.

~~615~~. Every hammock is allowed six Inches in breadth and six feet in length

~~616~~. The Keys of the powder magazine room &c are kept by the first Lieut.

~~617~~. Every person whatever the moment he enters a ship of war pulls off his hat

× 618. The sheets which haul
× the sails forward are called Tacks, those which haul aft are sheets

Waterford 1 May 1782

~~617~~. The wind blows in different Direction at small distances at sea. In Southampton river the packet and another sloop distant about one mile and both bound to Southt. were frequently upon different tacks at the same time and had a small breeze? –

~~611~~ About the middle of St George channel in my way from Bristol to Waterford I always perceived a sudden heat or glow at the approach of a squall. It was most sensible when there was a lather wind.

Waterford

~~621~~. What is the difference between the instant and pro-ceed by the marine and the ruleof aids?

~~622~~ Is not the strong attraction
the Vitr. acid has for Phlog.
the reason for diluting it with
water in order to produce in-
flammable air — and is not
this circumstance in favour of
the marine acid —

~~623~~ In some exp. made with
the marine acid it appears
~~that~~ the inflamm. air produced
by this acid on iron is not
inferior in levity, inflam.[ty]
&c. to ~~that~~ made by the Vitr
acid — this day 19 June
a balloon of [illegible] in Dr
floated and kept up
several hours —
A. M. P — 2.

Ch 4. ~~The costlus or ligament of~~
~~less hyfloes which are often~~
not true ~~found about the~~
mouth in the human spec

Carlow 10th July

<u>[illegible]</u> This day at Breakfast
at the wheat sheaf, upon
breaking an egg I found
the spoon strike on some-
thing hard upon furthe[r]
[illegible] found it to be a
small egg within the othe[r]
it is almost a perfect
ellipsis longer axis
shorter, specific gravity
greater than the large
egg. The shell of the large
egg has a membrane [illegible]
[illegible] [illegible]
the [illegible] of the shell

~~666~~. In working the cataract
the incision is made in the
cornea on the out side of the
eye — In ~~the~~ cataract
the incision is made near
the lower part of the iris.

~~667~~. The Eustachian tube
varies from the inside of
the mouth to the cavity be-
hind the hypsoronum, the
endeavour in the diving
bell passes from the mouth
along this tube and unbars
the ballonet + removes the
pain occasioned by the
pressure on the hypsoron

~~120~~ The elliptical arch is not so strong as the circular.

m It is remarkable that ancient never made use of elliptic arches in bridges or domes.

~~129~~ A portico or porch has commonly a pediment when long it is called a colonade, when arched an arcade, such as that in the college of Dublin

~~2~~ The piers of a bridge may be from $\frac{1}{5}$ to $\frac{1}{6}$ the span.

~~3~~ The catamaran common was never executed.

m ~~4~~ The Centre of Iron bridges was cast by screws, that

of Blackfriars bridge.
The centres are carried away after the arch is finished —

623. A Caisson, or Coffer Dam is made use of in laying — the foundations of bridges

J.W. the former where the foundation is to be ploughed the latter when there is a rock.

~~624~~ The piers of bridges weigh less in water than in air according to Mr. Hutton, but this ~~only~~ takes place only when the water gets below the masonry

~~[illegible]~~. Mr Argand of Geneva has got a patent for a lamp
Tri where a current of air passes thro' the flame —
~~[illegible]~~ If a bit of paper twisted is held in the flame of a candle untill it begins to flame, it will be found upon examinat. that those parts of the paper which are in contact with the air as well as the flame are burned
~~[illegible]~~. An elastic 1 machine made of oiled silk the [illegible] [illegible]. —
~~[illegible]~~. Balls with black and white ribbands —

~~637~~. May not a rope be rubbed ~~[illegible]~~ on a piece of wood so as to set it on fire?

~~640~~. How do the Indians light their fire with two pieces of wood? what sort of wood?

× 641. Spangled water may be much varied from the common form.
×

~~642~~. Rubbing Phosphorus may be applied to many purposes — Experiments to light a candle &c &c —

~~643~~. In what manner may a piece of iron be made so hot as to light a torch

644. Mr. Arbuthnot's method
of adjusting the positions
of the beam of a plough.

645. In the Rotherham plough
the position of the share
and coulter is awkward

646. Pitching a wheel
of decrease with wear than
usual, it seems to press the
rim more tight on the
spokes — Why does the rim
decrease?

647. The French make their
spokes sometimes bended
in the middle, by which
means when the wheel

cyts into a vat it is more
easily drawn out –

645. What is the best mode
m of filling the cask?

The best made use of
~~649~~ by the London porter
m is well adapted to purpose –

~~650~~. The manner of using
the shovel in Ireland is ex-
tremely awkward, the back
m of the left hand should
be turned up and ~~stop~~
the hand slip down near
the load –

~~651~~ Whether will water
cool sooner in a wooden
dish or metal decanter?

~~652.~~ Are coals always found in the neighbourhood of freestone as is commonly alleged? —

~~653.~~ Will not points in the rubber encrease the power of an Electrical machine

654. May not the same cylinder excite both negatively and positively?

~~Calor~~

655 ~~The steam nptly at Blackfriars bridge are brought by a crank~~

~~656.~~ — No Chimney room

— No

657. Oval wheels for the steam Engine —

~~158~~ Water be by to be
thinks that condensation
is the cause of heat.

~~159~~ Fixed air renders
calcareous substances
mild only from its being
an acid.

~~160~~ What is the best form
of a piece of iron which
can be rendered useful
by striking

~~161~~ A red hot iron will
not [illegible] to spirits

~~162~~ What is the reason
that a piece of iron is
rolled to the south when
the surrounding water

~~[illegible]~~ The smaller the bellows
— the more powerful the
M blast — [illegible] blow pipe —
~~[illegible]~~ On the common Hyd.
three degrees of the Ther.
will near [illegible] alter
the spirits 1 [illegible] Cent.
those only in [illegible]
×
665. To discover the difference
× of specific gravity of water
[illegible] a Glass bubble
to rest in the water by
the heat of the hand
introduce a small Ther
having only a few degrees
on the scale into the
water the difference of temp.
will point out the differ of
weight —

An Angel

An Angel

666 Flannel is the best material for sleeping on Elasticet rubber —

667 - Might not a hogshead be baked and roasted for an elasticet jar —

668. The steam engine × applied to Stone Mills — Saw mills — Weaving cotton Waggons — Pumps — row boats in a canal —

~~Later~~ Experiments made on the boiling point of mercury Water acids &c and in Vacuo and they were all found to be nearly the same viz 120. & 126. so that there is reason to conclude that heat encreases & elasticity of all vapours in nearly equal proportion ——

Water has been converted into Vapr. in an Excellent Vacuum at 41°. and the fixed mercury in Barometers converted into vapour nearly by the heat of the atmosphere

~~270~~. When a shot first
gets under way & proceeds with an accelerated velocity
till the resistance of the vehicle becomes in equilibrio with
the action of the wind, after
which it proceeds uniformly
the force of the wind being
employed.
entirely ~~consumed~~ in overcoming that resistance
This is not mathematically
true for a body never attains
at any ~~equality~~ uniformity of motion, for
the approach of the resistance
to an equality with the
impelling force is expressed
by a converging series the
number of whose terms is infinite

~~6~~ The greatest difference between summer heat and freezing cold on the expansion of air is as 7 to 6 —

~~7~~. The specific gravity of Quicksilver is to air as 14019 to 1/4 From this to find the height of the Atmosphere

1 1/4 : 14019 :: 30 : 336456 or 5 1/4 miles

~~8~~. The variations of the Barometer are greatest during winter than Summer, greatest in Jan.y and decreases till July —

64. When the wind blows into a country the Bar. rises when out of the country it falls

65. Vapour and moisture increase the weight of a Coll of air when Rain falls the Mer shrinks —

66. The sun and moon must affect the Bar. in the same manner they occasion tides

67. The pressure of the air occasions the difficulty of opening Oysters and the force with which some fish stick to rocks — bivalves

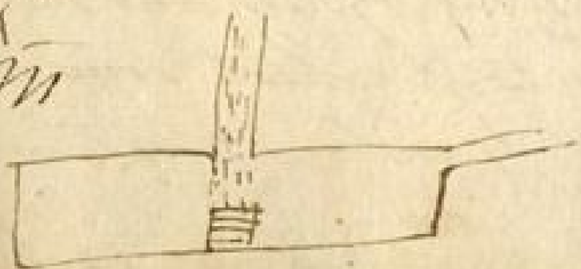
~~628~~ Breathing exactly like the action of a pair of bellows

~~629~~. Suction depends entirely on the mouth in which the tongue performs the office of a piston ——

~~630~~. Fish raise themselves by the air bladder —

~~631~~ Ventilation of Chimneys depends on the different gravities of air ——

×
632 Water Blast



~~623~~. Diving Bell — Sucking pump — forcing pump

Mr velocity of air — 1200 ft.

~~624~~. In the condensation of air there is a resemblance to water but in the former there is the latter suspense effected —

625. Gun is a pneumatic Engine — windows

6 broke by a wave of condensed air striking on the outside

626. Drum from force on its heads —

~~[illegible]~~ Ex. – hand struck sound
affects the teeth –

~~6[illegible]~~ All bodies whose ortho-
thographic projections taken
by rays in the directions
of their motions meet
with the same resistance
when moving in a fluid

Ex: g. A globe and cy-
linder moving in the di-
rection of its axis the Diam.
equal the resistance will
be equal –

~~154~~ The resistance which a fluid makes to a Cylinder moving in it in the direction of its axis is equal to a column of the fluid whose base is equal to that of the Cylinder and whose height is equal to half the versed sine of which a body ought to fall to acquire the given velocity of the Cylinder

Hence the resistance and retardation of a body moving in any fluid may be found the velocity, breadth and wt. of the body together with the density of the fluid being given

Example

A Globe of lead is 3 Inches
14 ounces Wt and moves
in water at the rate of 2
feet a second required the denst:
and retardation the water
makes to its motion

as Sq: Velocity 32 feet &
second ——— 1024

is to the Sq: Velocity falling
which that retards was } 16
required ——

so is the square of 2 } 4
to the given Velocity

So the space by fall:
which it would be } 64 1/1024 ft
required ——

The half of which is 1/32 of a foot

is the length of the cell: of the
× water
×matter. and its Diam. being

3½ Inches it will weigh 2½

ounces Troy which therefore
shows the quantity of the
resistance. we may now
consider the effect therefore as
if a body 54 ounces had struck
~~against~~ with a velocity of 2
ag.st a quiescent body of 2½
ounces and ~~carry~~ Pinion
the velocity of the body 54
to be after the stroke, 54×2 =
165 and the whole sum of
the motion is not altered
by the mutual actions of the
bodies, as therefore the motion
continues still 156 tho' being of

is increased by the addition of
$2\frac{1}{2}$ ~~Ounces~~ and so becomes
$86\frac{1}{2}$ instead of 84. To find the
velocity divide the quantity of
motion 168 by the mass $86\frac{1}{2}$
gives $1\frac{3}{10}$ The difference be-
tween which and the former
velo: $2 = \frac{7}{10}$ is the retardation.
Thus it appears that in
order to maintain the unifor-
mity of a body in a fluid, a
constant exertion of force
is required to overcome the re-
sistance, but as in general
there is no such exertion
the motion must decay by
degrees and at last terminate

~~[illegible]~~ If a musical ~~[illegible]~~ glass be
~~[illegible]~~ Electrified (charged)
and the coating removed and
the brim ~~[illegible]~~ rubbed
with a wet cork insulated
when the sound is pretty
strong the Glass will break.
M. B—

~~[illegible]~~

The Electric matter sent
over Copper filings is

Copper — Green like Glass
Brass — Light Green
Steel — yellow like Gold
Antimony — light white
Zink — Heavy white
Tin — Reddish —

Forked lightning blue &c on Glass
drawn with Gum wet on
the file dust strewed on at
the opposite side of the Glass
charged & discharged —

~~Lo~~ The blades of a knife
a watch spring and two
were all melted by a shock
from 20 square feet of coated
~~glass~~ glass in a jar of pure
air by Mr Cuthbertson's Machine

~~An~~ An Electrical mortar
threw a shell 4 inches in D
to the distance of above 100
feet it was made of wood
and the shell of Pasteboard
laid over with size and
black lead strewed on it

~~In~~ In Boston and Wells
Engine there is a contrivance
for regulating the motion of
the Valves through the year

~~1.~~ Electrical machine made in the form of a bell with two rubbers on each side the brim —

~~2.~~ In a rolling press the smaller the rollers the better — small rollers endure better than large ones. —

~~3.~~ Balls of Berlin made an Electrical machine of a glass globe moved horizontally, two rubbers at one end and the collector at the other end of the diameter — Moved by an endless screw or metal to Nairne's pattern

4 [struck through]. Powder magazine com-
posed of pieces joined by
hinges and locked by a
wire at top.

4 [struck through]. Cubic eqnt cannot
be resolved geometrically.

5 [struck through]. The trisection of an angle
~~the~~ the duplication of the cube
and the squaring of the circle
are three problems which
have never yet been solved

4 [struck through]. In Ferguson's Paradox
the fixed wheel has 39
for teeth the middle [illegible]
39. the undermost of the three
39 causes the [illegible] axis [illegible]
The middle 37 the [illegible] [illegible]

The uppermost wheel lies left
it goes for word and carries the
moons apogeet point.
In nature the nodes make
one revolution in 18 years 225
days In the machine in 18 years
and a half — The moons apog
goes round the ecliptic in
8 years and 312 days in the
machine in 8 years and 4/5
The procession of the earths
axis is perfect in the machine

~~697~~ Why is the Barometer
affected by Earthquakes &c
at some thousand miles
distance?
Aberdeen 27 Oct. 1786
~~698~~ A piece of Phosphorus
burnt in Pure air gives
an uncommon brilliancy

~~699~~ A Fly bent like an
hollow filled to the end
of a bladder filled with
inflam.^ble air whirles
round a circle of fire
700. Zurich Wheel new
Hygrometer of a human
hair – two fixed points
– Inkle loom –
Bucket wheel –
rope pump – French

Thunder house — Mortar &
a bladder tied over it —
— Circulation of the blood —
— Saw-mill — Ballots —
— Albion Mills —
— Organ bellows improved
— Fine air from Nitre made
in a Stone matrass &
bedewards use. —

~~701~~ Plummet made of a lead and a light body floated in water —

~~702~~. Skips and a Staff for the shielding table —

~~703~~. Anemometer for an Organ

No organ pipe [illegible] is required more than to raise the water 3 Inches in the tube A. The pipe B is filled to the Evenage of the Bellows. by this instrument the pressure of wind is ascer-

by adding more or less
weight to the Bellows —
Mr. Ar—n

~~904~~ If two pieces of wood
are planed clean and
and joined with a
piece of blotting paper
M soaked in weak Glue
can easily be separated
This useful in many
cases — Mr. A—n

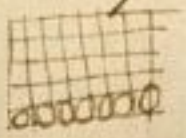
~~905~~. Mr. Handel once had
an idea of introducing
Cannon into his music

~~906~~ A Grain of Copper
will tinge 165 Cubic inches
of water —

707. The unassisted eye can undoubtedly see $\frac{1}{200}$ part of an inch

708. Infinite divisibility of matter demonstrable from that of Space by its having one of the dimensions common to Space Length

709. From the infinite divisibility of matter it can be proved that any particle however small may be supposed as to fill the solar system with matter having powers shall not exceed a given quantity —



$\frac{x}{\cdot 7}$

~~710~~ The Last length of a pendulum counted should be about 6 Inches and should be made of Steel as this expands less than brass — N. B. —

711. Baylis Enforcement of a thread of Silk ~~from~~ the worm —

712. Gold Lace — Gilt Silver

713. Odours — Hungary water bottled in a small Bottle — Phile — or a Spirit of wine Lamp —

714. The matter in the animal bodies from and a very small proportion to the quantity of Water

715. the glass is penetrable in every direction by light with so many [illegible] How inconceivably small must the particles be! — Jobb

716. Mr. Mc. Cage has found out a new rule for the Longitude — sent to the royal Society —

717. Attraction of Grav. in the inverse proportion to the square of the Distance — proved by concentric circles — sphere prisms — Mountains. — Attraction of cohesion Two pieces lead — Brass plates — Two ~~pieces~~ Balls of cork — floated

on Water — Mutual earth other
— Mercury — Electric Mag-
netic Attraction &c —
Refraction — heat — steam
Electric — Magnetic repulsion
— Electricity caused by Re-
pulsion of the particles on
one side — compressed
air exhibits repulsion —
Ammonia — Crystallization —
Form — Books — Vocables —
— effects of subterranean fires —

~~718~~. An organ pipe when shut at top sounds the ~~higher~~ lower octave to the note when open —

719. Women sometimes have the tooth ach —

~~720~~. A tooth taken out of the head and boiled for a few minutes & the hole filled up w. tin and replaced in the head after a few days fixed. — M. A — n

721. The best organs of have pipes of wood, metal and reeds —

~~722~~ The best wood for organ pipes is red Deal free of Turpentine —

~~723~~ Wooden pipes are lined with stoppers covered with leather - The Metal pipes with metal cones —

~~724~~ Best metal for Org: pipes is made of lead and tin —

~~725~~ Every pipe has a stopper to regulate the quantity of wind —

Sea

726. Horse teeth make the best teeth for the human head —

727. Manufactures for a Course of Lectures —

Cotton —
Linen — Printed —
Silk — worm — Dyeing
Woolen — Dyeing —
Fluffs —
Cutlery — Toys &c
File — Saw — Smiths —
Button — Buckle — Pin —
Needle — Thimble — Plated
Toy hardware — Gun &c
Tin works — Iron work
Clock and Watch work
Vitriol — Salt — Oil —
Vinegar — Sugar — Rum
Brandy — Wine —

Paper Machee — Paper
Parchment — Inks —
Sealing Wax — Soap —
Glass — Earthen Ware —
Japanning — Tanning
Hides — Varnishes —
Silvering Mirrors —
Silvering Copper or Brass
Plate — Glass Grinding
Glass Cutting — Gilding
of Wood — Metal — Leather
Brewing — Distilling —
Cements — Lutes — Gold
and Silver Lace — Tinsel —
Precious Stones — Steel —
Tar, Pitch, Turpentine &c &c

Arts & Manufactures —

Tanning — Hatt — Weaving
Lacquering — Hat manu —
Sawing — Coinage —
Engraving — Cyphe founding
— Wafers — Waste of
Paris — Tobacco pipe —
Drugs — Sugar Candy —
Barley Sugar &c &c —
Perfumery — Tobacco —
Architecture — Bridges —
Butter-Churn — Roofs —
Enamelling — Goldsmith —
Jewellers — Seal Engraver —
Organ builder — Rope work —
Lime — Brick — Centers of bridges
Screws — Printing — Cotton & Spinning

Parts and Paraphernalia
Wheel carriages — Mill work
— Ploughs — Harrows and
other implements of husb.
— Soldering — Welding —
Horn — Carpet — Whip —
Stocking — Diaper —
Jacke — Ribbon — Belt
Common metal — Shagreen
— Hair and wire cloth —
— wire drawing — Rolling
& slitting Mill — Tea —
— Apparatus for recovery
of Drowned — Buoys —
weighing of Ships —
Etching — Aqua tinta
mezzo tinto —

Arts and Manufactures

Copper plate printing —

touching Compass needle

Gold beaters — Nail works

whale fishery — Bonnet

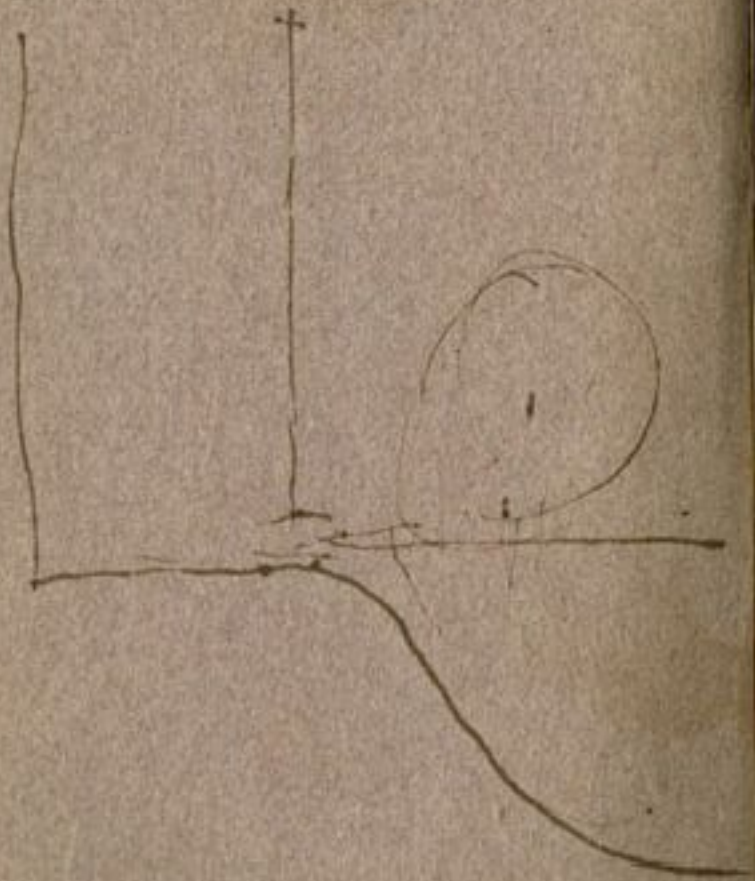
Steam Engine — Cyder

Tar works — Thread —

wax works —

Carding — Arches —

Fowling — Salt Powder



by the Yr

English —	2 5 6
Lat: Yr	3 5 6
French	4 11 —
Writ: & Arith	3 5 6
Geog:	2 5 6

Academ: Com. 13/13

~~4 2 15~~

4 – 2 –