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of
the
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Calcutta

1809

Series

and

Writs

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21st Ed

J. D. Newell LL.D.

Calcutta

1797

Calcutta 7th Sept. 1797 —

171 — The proportions of the Troy to the Av.
weight ascertained by the following persons

Mr. Boyle $10\frac{1}{8}$ lib Troy = $15\frac{1}{17}$ lib Av

Mr. Wingate $14\frac{12}{or 8}$ Troy = 1 lib av

Mr. Everard $10\frac{2}{lib or}$ Troy = 15 Av: —

Mr. Ward - $14\frac{12}{or 8}$ - $15\frac{1}{or 8}$ Troy = 1 lib Avon:

~~Mr. Wingate~~ lib

Mr. Wing 73 Troy = 60 av.

and 73 Troy = 80 av.

Calcutta
Sept. 3
1797

172 The Solution of Water in air is dry
and invisible as air itself: it is propor-
tionate to the temperature of the At-
mosphere. The Hygrometer does not in-
deed with precision, this water, for it
is not affected by a complete solution of
air water in air, but moves according to
the quantity of water which is just going
to be dissolved, and still more of that
which is precipitating from it —

173 Mr. Dalby thinks it probable that
the meridians are not Elliptical in low
latitudes: but that the earth as M. Bouguer
supposed is flatter in a north and south
direction, or has more of a lobular form
in those parts than ~~parts than~~ ^{an} Ellipsoid:
but nothing conclusive concerning the
figure and dimensions of the earth can
be drawn from determining differences
of Longitude by Time-keeping as practised
by M. Richin Bouras in India —

174 From Mr. Burrow's measurements made in India, Mr. Dalby after the necessary corrections the length of a degree on the Meridian is Lat $23^{\circ} 10' N.$ to be 60455 fathoms, and for a degree of Longitude is $23^{\circ} 20' N.$ 55905 —
 — Both from Mr. Burrow went twice in Winter time backwards and forwards from Calcutta to Cheraipat. The extreme of the East and West line. The mean result he finds down at $2' 32''$ for Difference answering to the apparent length 272670 feet measured with the Chain —

175. In the operation of fulling cloths, two things chiefly are necessary, first the washing away all impurities, and secondly the thickening and consolidating of the web by the curling or intermixture of the fibres on its surface. ~~the surface~~ Any kind of clay possessing the following properties, will answer the above mentioned purposes.

1. Silicious part finely divided — not hard the fibres
2. Argillaceous proportion must not be

too small, that it may dissolve readily in water, form the necessary consistency, and be easily washed away when the operation is finished.

3. It must not be combined with any coloring matter, either bit. acid, or any other capable of affecting the dye of the cloth.
4. It should contain a small quantity of chalk.
5. Nothing of the kind of Pyrites ought to be in it. It may however contain the scale of iron unincorporated with any prejudicial menstruum.

Clays fit for fulling

	Loam: parts	Stam: parts
Silicious part: 47.0	—	51.0
Acidulated lime 5.4	—	3.3
Acidulated Mag: 6.2	—	0.7
Argillaceous Earth 17.0	—	25.0
Calcareous iron 5.4	—	3.7
Morit Col mat 47.	—	15.3
	100.	100.

176. The Linnæian Earth called also, *Hyellum Capsum*
or *Terra Junica*, has been held in the highest esti-
mation from the time of Homer and Pline. It
was never dug up without great parade of religious
ceremonies; and the Ancients report that whether used
externally or internally, it was a medicine endowed
with *Atropharionie*, *Diaphoreticæ*, *Potensæ* and healing
virtues.

177. Soaps would be preferable to earths for the
business of putting, if they did not generally affect
the colour of the cloths -

178. Arsenic is sometimes united with corrosive
sublimale. To discover whether this has been the
case, powder a little of the sub: and sprinkle it
on burning coals in a hot iron - *Serli* small.

179. The mercurial acid seizes upon Mercury
Dissolved in Nitrous acid, and if the mercurial acid
be oxygenated the precipitate is corrosive subli-
mate; but with common mercurial acid it is
Calomet or *Mercurius dulcis* - This precipitate
of Cor: Sub, is generally made in the dry way
by ~~mixing~~ equal parts of Mercury, common
Salt and green Vit., and exposing the whole to
a moderate heat, when the Cor: S. sublims in the up: light.

180. To ascertain the temperature of deep water
the Thermometer may be put into a glass
vessel, then so filled with sand that the point
of the scale is near the bottom of the vessel.
The vessel may then be wrapped up with flint
wool or cloth and immersed in a perpendicular
tube inserted into the well, should remain
about half an hour. By this means the
effect of the breath, atmosphere &c. is entirely
removed.

181. White mercurial precipitate is adulterated
sometimes with white lead. To discover this
add to the precipitate one fourth of any leaded
salt, the whole to be exposed to the fire till
the mercury rises under the appearance
of smoke; if lead be found in the crucible the
fraud is beyond doubt; if not the matter re-
maining will be a Digestive Salt soluble
in water. Should no part of the residuum admit
of Sublimation, the adulteration is made with
white clay. Sometimes starch used. This is done
by the levity of the residuum and the Carbonaceous
mass left after ignition.

182 The Ancient Chemicists boasted "That they
would tame the fierce serpent and reduce the
Dragon to such subjection as to oblige him
"to devour his own tail" that is they would
soften and abate the acrimony of corrosive
mercury

183 When Gold has lost its ductibility ~~either~~ by
or rather when it has acquired too much
hardness and brittleness, by the intermixtures
with other metals, or by the action of their
vapours, the ductibility is restored by throwing
a quantity of Cor: Sublim. etc. on the melted
gold; for the mercury and having a greater
affinity with most of the other metals
than with mercury or gold, leaves the mer-
cury of the Cor: Sub. and attracts them from
the gold - avoid the vapours

This made of purifying gold is preferable
to the process by the dissolution of Nitric; for
the dissolution with nitric separates not only
the base metals, but even silver from gold
- Cor: Sub. may be employed to preserve metals
that have been fused with acids from too much

rigidity: As the principal use of it is
to cast ^{common} brass, throw salt on the metal in fusion
to render it soft and more ductile -
184 Cor: Sub. and white precipitate are used on
printing cotton, to make the cloth receive
the colours, especially red, and to make them
spread equally on the ground - Cor: Sub. used
in dyeing black with black - but of no use -
and is commonly misused to clean printing
blocks from Antimony &c. -

185 Most mineral springs owe their healing
virtues to either to acrid acid or Nephritic air
Acrid acid, which is contained in a pretty
large proportion, in water, produces but little
alteration in its nature, such as in the propor-
tion of weight or ten cubic inches in the pint.
Nephritic air is a much more powerful agent
than acrid acid, and is easily known by its
smell -

106. I never met with ^a spring water entirely
free of Salts or Aerated Lime. - Bergman
The Prussian acid is discovered by the Nitrate
of Silver, the calcareous earths by Acid of Sugar
- acetic acid by tincture of turnsole - or better
- by Lime water
- Muriatic of Bergman discovered by acid -
- Tincture of Gallic and the Prussian alkali, the
existence of iron

107 The tincture of turnsole is of all other
known tinctures the most easily acted on
by acids

108 In experiments which require much deli-
cacy, alkali prepared from Linnæus cream
of tartar can be used by Bergman -

109 The weaker any alkali is, the more
fixed air it requires to saturate it -

110 Fixed air by what ever process it is pro-
duced, if properly separated, is always the same

192. The phlogisticated alkali is best
prepared from four parts of Prussian
blue boiled with one part of alkali in a
sufficient quantity of water. The clear liquor,
saturated with an acid, must then be freed
by filtration from the small portion of Prussian
blue which is separated. This preparation
is well adapted for discovering the smallest
portion of iron, which it precipitates a Prussian
blue - copper of a reddish brown colour - Man-
ganese white &c -

193 Concentrated nitrous acid deprives
the hepatic water of its sulphur

194 Acid of Sugar is the best test for Lime
however mixed - white clouds and stria

195 The oxygenated muriatic acid (Dissolved
all the metals completely - Bergman -

196 If bread be baked with water in which Iron
has been boiled, it is said to be ^{stronger}
and more nutritious -

197 A longitudinal vibration in stressed things has lately been observed by a German philosopher. This does not like the transverse vib: depend on the quantity of matter, but seems more affected by the quality of the material —

198 The Fifth Sat: of Saturn seems to turn round its axis in 7 $\frac{1}{2}$ days, inference from change of brightness. It is ~~strange~~ remarkable that by performing its rotation in the same time as its revolution, like our moon it always turns the same side to its primary planet. —

199 The number of Ships great and small that can be kept at low water between London bridge and Deptford, at the regular morning low does not exceed 800; warships and vessels that grounded not included; whereas in 1792 above 13,300 vessels arrived in the port of London — The Royal grays are the more in extent now as at the fire of London in 1666, and do not exceed 1464 feet in length.

Whole thro' of Bristol are more than 4000 feet. Lapses are estimated between 2 and 300,000 L of anⁿ — owing to this —

200. The Doctrine of solution of water in air when applied to the phenomenon of rain does not seem attended with several difficulties. Were this theory true, the diminution of heat must in every instance be attended with a deposition of water; and on the contrary the deposition of water should be always coincided with cold. The former is in a certain degree true; but the latter scarcely observable in any instance. Indeed the opposite change is so considerable that rain must always, if this system be adopted, counteract its own cause.

As when evaporation is attended with cold, and deposition suffers the heat to escape, the temperature during rain, should constantly increase, so that the air must be enabled to retain one cause of condensation.

201. The mutual convertibility of air and water
into each other, agreeable to the new theory
of Chemistry, affords a more satisfactory solution
of the various phenomena of rain &c. than
chemical solution — Electricity has in all
probability some share in these phenomena

202. In a catch the three voices take the
parts alternately, so that each sing the
whole in turn; but in a Glee all begin at
the same time, and sing different parts from
first to last —

203. Doctor Johnson's Definition of Melody
by calling it Harmony of sound, is wrong —

204. If a Stone be thrown into a pond, and
immediately after that another, their respective
circles (waves) will proceed without disturbing
each other — This experiment may be better
performed in a large trough of quicksilver
Strike with the fingers the opposite ends
and the waves will pass each other without the

least confusion. This is perfectly analogous to
the motion of sound in waves of air —

205. Instructions for tuning a keyboard
Begin with C which make concert pitch by
the fork. From C tune a 5th up to G rather
flat; from G tune down an 8th to C, and from this
last G tune upwards a 5th to D rather flat;
from D a 5th upwards to A rather flat, from
A down 8th from this lower A a fifth upwards
to E rather flat; strike this E together with C,
which is the 1st proof, and if the 3 be too sharp
the fifths must be flattened a little more till
the 3 be perfect. From E tune a 5th to B, and if
B is a good 3 to G which is the 2^d proof then
the last fifth is properly tuned, if not it must be
altered till this third becomes good. From this
B tune down an 8th and from the lower B a
5th to F sharp which must be a good 3 to D
given 3 proof. From F^{*} tune a 5th upwards to
C^{*} which will be a natural or sharp third to A

which is the fourth proof. From C[#] turn
down an 8th and from this down C[#] turn a
5th to G[#] which will be a third to E the 5th proof
Having thus turned all the sharp keys, we must
now turn an 8th from the first C upwards and
from thence turn a fifth down to F pretty close
with this F makes a good 3^d to A, and from this
F likewise turn down a 5th to B^b which will
be a 3^d to D. From B^b likewise turn down a 5th
to E^b which will be a third to G. It only
remains now to turn octaves, and the instru-
ment will be as completely in tune as the
nature of brass and construction of the instru-
ment will admit of, that is where the same
thing is made to sound the sharp notes below
and flat above —

206. The Trump and the organ are the richest
of all musical instruments; though, as the
notes of each are determined by the a fixed
length of their strings, they are less perfect than
those of the violin and violoncello &c. pro-
duced by a different position of the fingers
which by their strong elastic pressure give
them a sweetness and delicacy unattain-
able by any mere mechanical adjustments.
It is for this reason that the best perform-
ers seldom sound an open string of the violin
which gives a perceptible harshness even
in concert. They play the same note by
slipping into the next — Another great
advantage which instruments stopped with
the finger have over all others constructed with
fixed chords for each note, that by a roll of
the finger that are called by the name of the
irregular intervals which cause a full
short of the mathematical exactness, are corrected

207. Mr. L. Cat maintains from a conceit
not putting out the candle in the room,
that gross atmospheric air is not the medium
of musical sounds, but that sweet subtil
fluids must exist in it, each of which is adapted
to the vibrations of its particular note.

— To this it may be replied that the
vibrations of a musical chord are so ex-
tremely short, with respect to the space moved
through, that they are absolutely imperceptible
as well as the times of their courses.

Saracen notes the gravest note = $12\frac{1}{2}$ in
a line, and the most acute the ear can
distinctly hear = 51100 which of course must
be so almost infinitely minute as to bear
no sensible proportion to the diam^r of the
flame of the smallest taper —

208. Concordant notes do not strike the ear
at the same instant — except unisons —
M all others more or less perfect in proportion
to the frequency of concurrence —

The great Bell of St. Mary's Church at Cam-
209. bridge sounds a formerly concert pitch,
and was used to tune musical instruments.

210. If the finger is pressed hard on the middle
of a string of the Violin, the sound may either
end with the low ear produce an 8^{th} to the
whole; but if lightly, we may distinctly
hear the two octaves at the same time; and
by slow and thin letting off the finger, and re-
placing it gently on the string, the fundamental
note will rise with the Bass and its two
octaves. If one third of the string be stopped
hard the command sounds an 5^{th} , but if
gently, a 12^{th} octave to the 5^{th} .

211. The *Manfichon* should never be played without the accompaniment of some other instrument; or as an accompaniment to the voice - Tho' several eminent performers think otherwise - It produces, as a solo instrument little effect on a general audience.
212. It is probable that the process of Sublimation was known before that of Distillation and that the latter was wholly unknown to the ancient Greeks and Romans - consequently ardent spirit was also unknown - Distill: was introduced into Europe by the Moors of Spain about 1150. They had it from the Arabian Moors who learned it of the Egyptian Moors -
213. To study says the Abbe Brothier is paradise, to compose is purgatory, and to print is hell. -
214. The Chanisher D'Aguisseau observed of ~~the~~ Voltaire, in his epistle to Urania "par le

- "tout de son esprit, celle home pret a perdre son Etat."
215. To put ^{an} end to the amusements of Charades with which the Empress of ~~the~~ Russia had been one evening at supper suddenly dismissed the game the following
- From premier est un Cress
 From second est un Cress
 Men tout ensemble est un Cress -
- In the company thought and then was and end of the matter.
216. Hereditary from our way thing to with and to chance according to Daviter how comes it to pass then says the Abbe Brothier, that men have ^{been} more indebted to birth than to choice for most of their great and excellent services.
217. bread and cost when analysed by Distillation give nearly the same result - The remainder of the game is

Charcoal of the better coat
a liquid paper on from both countries
of a light oil on the surface, was and
phlogiston in the middle and a thick heavy
oil at bottom - Besides a considerable
quantity of inflamm^{ble} air - The phlogiston
contains Vol: alkali - The fluid
which comes over is in coat generally about
 $\frac{1}{5}$ part of the weight of the coat

218 The vapour which escapes from Lead
C pits on fire, in Staffordshire, always
forms an Alkum when it meets with
Argillaceous earth. The vapour con-
tains the Sulphureous acid -

219 Dr. Kecker found by experiment that
hot charcoal weighed less than when
C cold, this may be accounted for two
ways either from the charcoal being
attracted water or some other substance from
the air or from the current of air occasioned
by the heated body striking against the scale -

220. Charcoal when taken out of hot sand
C takes fire in the air - Pyrophorus

221. The coat of gum Guaiacum taken out
C of the retort was two or three days after
- the operations when exposed to the air takes
fire readily - a good Pyrophorus -
The retort must be stopped & allowed to
cool gradually

222. Onions and other bulbous roots when
C suspended in a room and melted for
rain and due increase much in bulk by
germination but decrease in weight.

223. A Despreux patient is said by Dr. Han
sometimes to absorb 100 lbs of water a day
from the atmosphere - a young lad of
new broath is one hour gained a w^g of
30 ounces that he had taken only half a glass
of wine - 8 ounces of Salt of Tart. exposed
to the air for a few days become fluid w^g 20 oz

— One pound of strong Sulphuric acid
exposed by the air for twelve months
weighed ^{seven} ~~ten~~ pounds, weak acid loses weight
— Fresh frogs nor heads of turtles drink
in Jamaica, and yet they are continually
sweating. The air is so moist that the
absorbing power of these animals imbibes
a sufficient ^{quantity} of water. —

224. If the neck of a thermometer be
moistened with sweet oil or other
oils of a viscous nature, no cold is pro-
duced because these oils are not easily
evaporable —

225. Does a defect in hearing, occasioned
either by age or accident, produce any
alteration with respect to musical sounds?

226. The Receipt of the Queen of Hungary's Salve
Take aqua vita four times distilled thirty
ounces, Rosemary flowers twenty ounces, all
into a vessel stopp'd for fifty hours,
then Distill in Bal. Maria — Dose one Dram

in the morning once a week in some other
liquor or else with your victuals, and wash
the face every morning, and rub the infirm
members therewith — This remedy renews the
vigor, causes a good spirit, lessens the maner,
fortifies the unpaired spirits, renewing their op-
erations, restores the sight and preserves it
to old age, it is excellent for the stomach and
breast, rubbing them therewith — ^{may be} applied cold!! —

227. The receipt in the last article was given
by a Hermit to Donna Isabella Queen of
Hungary as appears from her own Declaration
to be seen in the city of Buda —
"I Donna Isabella Queen of Hungary aged twenty
"five years, inform in my members and soully
"I have used this present receipt, a whole year,
"which an Hermit whom I never saw before nor
"since, gave me, which had such effect upon me,
"that from that instant I was cured and recover'd
"my strength, inasmuch as appearing beautiful
"to every one, the King of Poland would have
"espoused me, whom I refused for the love of
"our Lord Jesus Christ, believing it was given me
"by an Angel!!"

220. Powdered Sugar thrown into the Urine
will prevent the making of beetles!! Lemong-

!!
229. To make flowers of any colour -
- steep the seeds in ink for black, in
verdigris for green &c!! Lemong -

230. For sweetly stinking feet -
wash with a solution of Roch. Alum in
hot water

231. Process for obtaining the Sebaccic acid
M. Leth's method is to treat soap made
of animal fat and alkali with a solution
of Alum, this separates an oil, the liquor
is then evaporated, result is the salt of
Pot ash - this ^{salt} distilled with Sulphuric acid
produces sebaccic acid - To purify for Subp:
acid distill again in $\frac{1}{2}$ of sebaccic acid
reserved for the purpose

232. What is the best substance for preserving
Eggs? Something which will dissolve in
boiling water, but either not at all, or with
difficulty in cold water -

234. Some Suspects are capable of being tamed, these
might be rendered of more use to families than
cats; for they are great enemies to rats, mice and
all kinds of insects; besides, they are beautiful - certainly
not so wicked as cats; they are familiar and sensible
of the attentions of man

235. Capt. Coote says he had seen a Hindoo,
who had not taken food for some few days,
refuse to eat rice because it was boiled by a
Christian; he was then offered an earthen pot
to drop some for him, but he declined he
would rather starve than eat of any thing
which was not prepared in ~~ance~~ a Hindoo
kitchen!! - The Regulations I think look at this
rice in earthen vessels - Earthen pots -

236. The Bramins light their fire by
the friction of two pieces of wood, given
the kind and shape, also process of
match used -

237. How long has the spirit and the bar
in me in India?

238. There is no word in the Sanskrit language
for gun powder - Composites are men-
tioned that go off with a great noise -

239. The acetous acid, it is said, has been
used for clothing, and it makes finer
traces than the nitrous - M 13 - c

240. The lion will not eat the flesh of
a dead animal, unless much pinched
by hunger -

241. The murex acid may be oxygenated
by simply mixing it with manganese in
a strong bottle not quite full. Air bubbles
are formed on the surface of the liquor, and
the empty space is filled with a greenish
vapour. After some hours the acid may
be still more diluted with water and made
up of. It has a sour taste because not
fully saturated with oxygen, but perhaps all the
powers of oxygenated murex acid -

^{oxy}
242. The murex acid is not so good a test
for Indigo, as for Cochineal, a solution of the
former never loses its colour entirely, whereas
there is any alkali in the liquor -

243. Black lac is imported into every part from
this country, and (India) and afterwards
almost all exported to Portugal, and Boston
and employed in staining Goat skins
to produce what is called red Morocco leather

244. The colours dyed by the lac are not
quite so rich and beautiful as cochineal,
but more durable, especially on cotton -
Lac and cochineal may be used together
both require the same basis and nearly
the same treatment -

245. By adding a little manganese to the
solution of Indigo, by oil of vit. the blue colour
is destroyed as effectually, and in the
same way as by oxygenated muriatic acid -

246. The Nitric acid, even when diluted
diluted, not only destroys the blue colour of
Judice immediately, but dissipates the greater
part of its substance in the form of Vapour.
By a slower combustion, leaving behind
a rusty iron coloured gummo-resinous
Mass soluble in Alcohol and partly so
in water, but of no use —
— Hence might not the diluted Nitric acid
be employed to determine the quantity
of colouring matter in Judice? —

247. The quantity of rain, and fertility of the
Soil of France have much decreased
since cutting down the woods. In hot climates
clumps of trees should always be left at
certain distances over the country, to attract
the clouds, and shelter vegetation from the
excessive heat of the sun —

248. The cotton which grows nearest to the
Equator is generally supposed to be the best

249. It takes near twice as much lock-
ing to produce a crimson colour on
Wool as on wool —

250. The Arabs of Barbary are unac-
quainted with the practice of shoeing horses.
But the ground is in many places re-
markably stony and uneven —
+ given to what countries is the practice of
shoeing horses confined? —

251. The universal hatred against Christians
of all denominations, which universally prevails
through Arabia Syria, Egypt, Barbary and
other countries, had its origin in the Crusades.
The horrid cruelties committed in Syria under
the cloak of religion have justly drawn on us
the just hatred of all the nations of the East
a hatred which six hundred years have not done
away
The modern Arabs know not why they hate
us but their fathers did —

252 What a shocking revolution in physics
has taken place in Arabia! In that
country one cauterized the ~~the~~ ^{the} ~~Fellows~~ ^{Fellows} of medicine
physic, with whom works or even names the
modern ^{wholesale} ~~of these countries~~ ^{are} ~~unacquainted~~ —
— Bleeding includes almost the whole practice of
It is performed by tying a bandage round
the neck of the patient so closely that he
is almost strangled. When the veins ^{of the face} are
sufficiently swollen by the circulation being
checked, the operator makes four or five
incisions with a razor, and in a ^{moment}
the face of the patient is covered with blood,
the effusion of which is assisted by rolling
a cylindrical bit of wood over the incisions

253 The Arabs inhabiting the coast ^{of Africa} are sub-
ject to the Venereal Disease, which they call
the Disease of the Christians. They use no
remedy for it. Owing however to the purity
of the air, and simplicity of Diet it is more
mild here than in Northern climates —

254. Indian as good a Taperary as the Chinese
adamantine Spar, pulverized and embedded
in oil, ^{instead of resin and paper} ~~is used~~ ^{to cut and} ~~prohib~~ all sort of
stones,

255 Bamboo made into paper household fur-
niture, palanquins and utensils, Ladders and
scaffolding for Architecture, Mats and yards
for Shipping — Plute-palissades — Carts —
Bows — Spears — Spears for water petcher
Dippers for conveying water — measures
for both solids and fluids — Balance beam
for weighing goods — Food — Ropes for
Shipping and other purposes —

256 The animals were attacked by the plague? Do not those that have hair and wool communicate the disease? —

257 The Moors of Barbary eat with their fingersummy to plain Beef, Mutton, Goats, fowls
Courcous in fear of which are used between two portable millstones and placed in a Dish with holes in its bottom over the vessel in which the meat is boiled —

258. The natives ^{in India} used Gold and Silver
This has not been done in Europe.
The Gold and Silver must be very pure

259. It is said that the tree producing Gum Arabic grows spontaneously in Bengal — The baobab tree —

260. The tremors of Refracting telescopes which are much greater than those of Reflectors are occasioned by the Springs which used to support the great mirror. The small eye hole contributes a little towards tremors

261 The Malays &c. poison their creeps with lime juice and Arsenic this looks but a short time, the Arsenic is prepared and tried before they go to battle —

The small arrows blown thro' the spear tube are poisoned with a vegetable poison. It is prepared by the Mountaineers and is punched by the Malays who are ignorant of the kind of plant on which it is made —

It seems to be wrought up with some sort of Gum, and is said to affect only the Nerves. It kills in a short time the largest animals Eggs, Buffaloes and even the Alligator and Elephant — N. S. — t. Dub. — O. — 9

262 The reason why a small eye hole in a telescope causes indistinctness of vision, is the reflection of light —

263 Doctor Herschell sometimes uses a power of 6430 in his seven feet Newtonian Telescope for viewing the Great Stars —

264. Distilled water is unfit for drinking unless
it is impregnated with atmospheric air.

265. The Mr. Kochon says "that one thousand
bars of iron were the daily produce of the
Alton Mills, a quantity sufficient to sup-
ply one third of the inhabitants of London"

266. The proportional accuracy of all beams
is relative to one weight only, and diminishes
if that weight or load be altered either way.

267. If savages were as miserable as we suppose
because they despise what we so much ad-
mire; why should they refuse adopting our
manners, customs, religion and laws?

- Story of Vanda the Dutch Governor of the
Cape and the young Potentot - see the
Mr. Kochon's Voyage to Madagascar page

- Do
268. Steel produces less rust than
C bar iron - guess why? What is the
qu. real difference between steel and iron -

269. Eggs, even of the smallest insects, it is said to
C not freeze -
qu.

270. It is said that persons who have been
bitten by mad dogs and who have gone
immediately after to sea, have remained
two or three years at sea without being affected;
but shortly after their coming on shore have
gone raving mad - if so guess the cause

271. There are many inconveniences attending
the present night signals - Blue lights and
rockets are of too short duration, and in a large
part of repeated from necessity, may occasion much
confusion - Instead of which let 3 lanterns be
used, and them be provided with coats or jackets
of coloured bunting, each coat having two colours
which are best contrasted with each other, with
a black line between - 3 lanterns will serve for
999 signals - For jackets for 100, and lanterns over
for the hundreds as follows - no substitute is sup^d

1 2 3 4 5 6 7 8 9 0
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White
 Blue Red White

Let the numbers as far as wanted follow the colour of their corresponding numbers above only let them be repeated in Chubbard instead of plain

Made of making signals similar to the telegraph - For this only one flag quartered and three small signal pendants are requisite to indicate every letter in the Alphabet as in the following table

Flag	Now shown		With Comments		
	No	Color	Red	White	Blue
Blue	1	Red	A	L	R
	2	Red	B	H	S
Red	3	White	C	L	T
	4	White	D	M	U
White	5	Blue	E	N	V
	6	Blue	F	O	X
Yellow	7	Yellow	G	P	Y
	8	Yellow	H	Q	Z

N.B. The flag should be square - The flag itself will make eight signals, and the 3 comments added, will make 24 = letters in the Alphabet -

By the above mode a correspondence may be held with a ship even built down - important intelligence communicated &c - some what tedious - useful in the Pilot Service

The above article is the substance of a paper which I have received from Mr. Edw. Murphy of the Ship London with a request to lay it before the Marine Board -

N.B. The paper was laid before the board, who did not however think proper to encourage the plan -

272 To find the centre of Oscillation, in a vibrating body - Count the number of vibrations in a minute. which call n . Then $n^2 : 60^2 :: 39.1^{\circ} : \frac{140050}{n^2}$

273 The month of Jan. 1795 was the coldest & that of Jan. 1796 the mildest ever recorded in England. The Thermomete in the snow.

average height	23°
Expos ^d Ditta	29.4
1796	
Ther. Jan ^r snow ^d average h ^t	43.5
Expos ^d Ditta	50.1

at difference of above 20°

In Jan. 1795 the burials in London amounted to

	2823
	1471
In — 1796	1352

(Diff)

From which it appears, says D. Metcalf that the common opinion respecting a cold and a hard winter is unfounded. A hot frosty winter is said to be the combination

1795

Deaths above 60 =	717
Atthina	249
Apoplexy & Palsy	52
Fever	250
Consumption	825
Dropsy	126

1796

Deaths above 60	153
Atthina	29
Apoplexy and Palsy	31
Fever	134
Consumption	342
Dropsy	70

Every Physⁿ and every Apoth^r knows that ~~the~~ ^{his} business in London increases and decreases with the Frost —

274. To know whether a piece of soft gold is
C Lim or lead or a compound of both
— If lim is will afford only oxyd of lim by Nitric
acid — The cold saturated solution in Men: a
will afford Calces ^{precipitate} on dropping into it Nitro-
mucal of Gold — will afford no acedite of
lead by Digesting it in acetic acid —

275 The ancients as Pliny informs us stamp'd
a particular kind of brass ^{as coronarium}
with ox Gall to make it look like gold;
and that the crowns ^{and} Chapelets of the papal
actors were made of brass so coloured —

276 The ancients were acquainted with the turning
C of Copper vesells "Hannam illidum in aneis visis,
— "Saporem gratissimum facit ~~et~~ et compositum Aragonis
(verus — Pliny Book 34 li: 17)

277 In examining metals —
C — 1st file and Drill to ascertain the texture
and hardness — also cut thro' with a chisel
Exam: — 2nd Melted in ingots in the same or equal
Drops — 2nd Melted in ingots in the same or equal
moulds — broken with the blow of a hammer
to ascertain the fracture —

— 3 Specific gravity before and after melted
into ingots — In the ancient metals used
by D. Pearson the Specific G^{ra} was always
increas'd by melting — Greatest after melting
= 0.800 — Least before melting 7.960 —

Exam. with fire

4 They all melted with a lower temper
return than that with which copper
melted, or were some kinds of brass —

Exam. with Wedgewoods Test. are contained

5 — To ascertain whether there was any
gold or silver mixed with 3 times the
quantity of lead — then a second time. From

The Spear head that remained in the
Copper a little silver - This dissolved en-
tirely in Nitric acid, therefore it contained
no gold -

6. With Nitric acid - polished and just melted
with Nitric acid - forms a white and corrode
like a mixture of Copper and tin

7. Experiment with the Pneumatic - ultimate
apparatus - quantity of nitrous gas receiv-
able - After being filtered through sediment
This liquor was afterwards evaporated and

Crystallized contained only Nitrate of
Copper, for it threw down nothing but Oxide
of Copper on adding Precipitate of Soda,
nor was any silver deposited on adding
bright copper wire - nor was any precipita-
tion occasioned by adding muriatic acid
or Muriate of Soda to the concentrated
blue solution

8. The white sediment was a light impat-

ibly fine powder - could not be melted
with borax by the flame with the blow pipe
but was diffused thro' hot salt and under the
it apart - This sediment (deposited) totally
by digesting in Muriatic acid, was immediately
in this menstruum when brought to boil

9. The white sediment obtained at first with extra
produced globules of tin with the blow pipe -
Copper precipitate by digesting three Ho-
urs in Muriatic acid and adding Nitro-
muriate of Gold

Result - That all these instruments
contain Copper and Tin, and no other
metals - but in what proportion cannot
easily be ascertained by analysis.

10. Test by Sythron - trying different proportions
until brought to the same proportion

Correct result -

Copper and tin only - No Gold seen -
Others discovered by Coppel.

iron by the Decipate of Soda - Iron
by the blue flame and white flowers,
and by the yellow colour of the grain
of the fracture - Bismuth by deluting
the Nitrate solution with water - Magnesium
- Manganese would have been seen on
concentrated by evaporation the Nitrate
solution - Arsenic by the whiteness and
brittleness of the metal and by the smell
- Antimony by whiteness and brittleness by
examining the whole sediment with the
blue paper - Cobalt by the Decipate
of Soda -

Ancient weapons &c were alloyed with
tin - The copper to the tin in various
proportions 6 to 1 to 12 to 1, Cells of
the hardest sort where most tin was
used

Copper cannot be tempered or hardened
contrary to the opinion of some modern

Who assert that the ancients had two me-
thods of hardening copper, one by cementation
the other by smelting it with iron - The former
has not yet been found impossible, and with
respect of the latter no iron has been ever dis-
covered in any ancient ~~see~~ copper instrument
or coin - Iron united to copper and tin
could be no improvement at least for chis-
ping instruments -

+ Iron metal consists of from 12 to 9 of copper
to 1 of tin - Sometimes a little Zinc is
added but for what purpose, I am not assured, nor
can the founder give any reason -

+ From 8 or 9 copper to 1 tin all the ancient
edge tools were made before the introduction of
malleable iron - viz axes, hatchets, Chisels
Shades, anvils, hammers &c -
+ The art of manufacturing malleable iron
cast iron was not known at least was not
practised extensively till within three 4 or 500 years

Refr which period instruments were generally made of copper and tin as the Chippewas and best metal for edge tools, steel caught - Best metal - In cases from $\frac{1}{3}$ to $\frac{1}{5}$ of the weight of copper according to the sound, size and impurity to be given.

The art of alloying copper with a particular earth, which within three fifty years we have learned was a ~~particular~~ ^{particular} ~~art~~ ^{art} of a particular metal (Zinc) was known to the ancients, being - Orichalcum - native and artificial Orichalcum was confounded - Ancients used this principally for ornaments, on account of its resemblance to gold - More extensively used by the Romans, cheaper than copper and tin - Better colour more easily wrought particularly into ^{metal} instruments - Does not ~~and~~ ^{corrode} so soon -

Copper may be united to steel without the intermixture of any other metal

In parts of copper with one of steel not harder than 20 copper to 1 tin - And a compact malleable mass could not be made of 2 copper to 1 steel - hence steel vessels in the composition

Native steel used by the ancients - very difficult to unite with copper - Tin easy - Native steel ore which produces malleable steel is found in many parts of the world The woods of India in the Northern Circars - Among the Hottentots -

The finest English tin cracks when heated or chanced, but pure Malacca tin has not this property

Perhaps metals in general are rendered pure, more uniform in texture and more dense by remelting than they were immediately after existing from the ore - or in the case of steel immediately after cementations or in the case of alloys after ^{they} fusion by which the union was effected

fact). Accordingly cast iron is rendered less brittle by repeated fusion - Steel is cast ^{by} simply melting converted steel - by Mr. Huntsman -
- Speculum metal resembled - Specimen greatly varies in the same metal more than what is supposed

- Of all metallic composition that of tin with copper produces perhaps the greatest increase of density - Observed by Astruc - = to abt. $\frac{1}{5}$ the bulk

- Property of hardness in alloys of copper & tin is nearly in proportion to the quantity of tin in the composition -
Citron Hardness.

- The tin in brass seems nearly in the same proportion -

- The Italian metal among the Ancient Romans according to Pliny consisted of one part of a mixture of equal parts of lead and tin to 15 parts of copper - Lead probably to save expense

- Tin was much more valuable to the ancients than to the moderns: without the use of this metal how they would have succeeded and ranged on the practice of the useful arts?

Tin was even of more importance to the ancients than steel and iron are to the moderns. because alloys of copper by tin would afford better substitutes for steel and iron than any substitutes which the ancients, in all probability could procure for ^{alloys by} copper and tin -

- Importance of Sp. Britain - being in all probability the only country which furnished the metal so necessary for civilization

Mr. Locke remarks on iron as the only instrument of civilization: not just "It is past doubt that were the use of iron lost among us, we should in a few ages be unavoidably reduced to the wants and ignorance of the ancient Savage Americans -"
"iron - Britain known to the ancients by

two names which signify the land of tin
one Phoenician Britain - the other Castellorides ^{great}

- Some affirm that the ancients were ^{inacquainted} with the manufacture of iron & steel - impounded but too expensive for general use

Iron and Steel instruments are destroyed commonly by the oxygen of water and of Atmospheric air. The destruction of iron Instruments is prevented by what we presume the union of the oxygen of these substances - Barnish preserved on of the ancient swords - Iron sword with the Copper scabbard totally destroyed; the part not in contact with the Copper preserved, shows the action of Copper and water united in destroying iron, the Copper remaining entire - This effect of Copper on the iron bolts and nails of copper bottomed ships is a sort of the greatest magnitude -

The process of acid found of one of the ancient Steel swords had been tried, part of the tin remained on one - Hence the ancients knew the mode of tanning iron - A drop of Nitric acid on a clean spot of one of the swords produced a black spot as on our Steel, and on the round part of the handle, a white spot -

Philosoph. Trans. 1796

270.

Which is the best mode of separating Gold to cupel and part at the same time or to separate the proufs separately? In the small way it is generally performed at once - Given what part has a greater or less quantity of alloy in determining this? Would it not be better in refining on large scale first to cupel and then part? Will not a great depth of metal prevent the absorption of the imperfect metals ~~into~~ by the test? -

The instructions from the Committee of the Royal Academy of France direct to ~~use~~ perform the prouf at once by adding both the Lead and the Silver to the Gold at first -

What are the principal objections to employing Copper instead of Silver in the parting process? Want of sufficient purity? - Iron not dissolved by Nitric acid, only corroded -

279. Copal from Mexico - varnish (Resin)
Copal in Linseed oil at a heat something less
than boiling, dilute the solution with ^{spirit} oil of
Turpentine - slowly dried - applied to stuff
boxes, tea boxes &c - Preserves and gives lustre
to paintings - restores the decayed colour of old
paintings, by filling up the cracks and rendering
the surface ~~more~~ capable of reflecting the light
more uniformly -

280. Vinegar does not dissolve copper when cooked
because the steam prevents the access of oxygen
from the atmosphere - Confectioners will
find it and even Lemon juice in ^{steep} copper
vessels without observing any bad taste or
noxious consequence - Better however to reject
copper vessels altogether from cooking -

281. What was the shape of the Horn of
Alexander, was it a speaking trumpet
as Lambert affirms? Is a curved or circular
form preferable to a straight one in the speaking

trumpet? as Lambert also affirms?
Might not the trumpet be of use in tele-
graphy?

282. Mr. Westwood found by many experiments
that Lead or Litharge employed in glazing of
pottery is but little dangerous; he also tried,
but without success, to substitute some other, less
harmful, material for the above purpose -

Directions to prepare and work the
Revolveratory Refining Furnace ^{or blowing} (see plates)

Let the furnace be built ^{as} to the plan
sent, the cast iron rim set level, to receive the
test when screwed up, and the test well dried.
Fill the iron test with bone ash or make a little
damp, so as they will bind. Let them be beat hard
in the test rim, by a pebble with a very smooth
face. Then cut it to the shape of those in the case.
The test should be made at least one month be-
fore it is used, otherwise it will be liable to crack
which renders it useless. — Put the test thus
prepared on the test base (E. N. 3) of the furnace
and screw it up into the rim, put the silver to
be refined ^{on} the test, and as much of the lead
as the test will hold, the whole must not rise
higher than the ^{bottom of the} gutter — Light the fire with the
strongest burning wood, sea coal is better, so as to
make the metal and test red hot. When it has
received a sufficient heat the same metal will
turn into litharge which appears on the top
like a thick oily substance. If the silver
should be very impure, having tin, iron or
much copper, a crust with lime on the top of the
metal, which must be put on one side, by an
iron

prober, so as to make a channel for the run
of the bellows to blow the litharge to the gutter.
This must not be done till the mass is in
perfect fusion, which may be known, by lifting
the crust up in different parts, the bellows is
then to be wrought, taking care to blow just
on the surface of the metal so as to drive the
litharge to the gutter when it must run off.
Examine the fire by degree, keep supplying
the mass with lead, at the mouth (E. N. 4)

an
A
—

Loss of Silver in the test.

Silver if not more than one ounce in the
test more than standard will require twice the
weight of of clean lead, if more it will require
more, the quantity must be judged of by the ap-
pearance of the mass on the test — Silver
being not more than one ounce pure and being
refined by this method will be found deficient
about 3 Dwts. in the pound. The average waste
from 1 lb. of pure silver is from 3 to 10 Dwts.
Which in London is no loss as the greatest
part is got back again from the litharge and
test bottoms, which costs us about 12 or 14 sh.
of the smelting —

Gold

Gold if alloyed with lead or tin of any
kind may be first refined on the test or
flued in a ^{small} pot with salt peter. If refined on
the test, the same method is used as with
silver — When the coarse metals are
separated by either process, melt it in a pot
with three times its weight of fine silver or
Dollars (they having no alloy but fine copper)
granulated by pouring it out of the pot into
a deep pan filled with water — It is then
put into large glasses 10 inches in diam. at
bottom, in shape like a common wine de-
cander or not more than 100 oz in each glass
Down in an equal quantity of strong aqua-
fortis and water, as with twice twice the metal
Set the glasses on the frame on the stove with
a bed of sand sufficient to keep the glass
from breaking — Fuel in the stove is charcoal.
Let there be a strong fire till the aqua-
fortis begins to work, then let it have a gra-
duated heat. When the aqua fortis has done
working, pour that off into jugs, and add
more till the red fume no longer appears. Draw this
off and add as much of very strong aqua fortis
as will just cover the gold. Let it boil for a short

time, then pour it off and wash the gold
out of the glass into a melting pot. Dry it
on the fire, melt it with a little salt peter
and it will be quite pure. The aqua fortis
(except the last) must be put into large
barrels or pans and there bring the quantity
of soft water added. Put two or three large
plates of copper into each vessel which will
gather the silver, let the plates be occasionally
moved, and the silver shaken from them until
no more silver adheres to the copper. Take out
the plates and leave the water to settle.
When the silver is all fallen to the bottom,
pour off the water carefully, and put the silver
into an iron pan and wash what adheres to
the sides into the iron. Dry it over a slow fire,
then melt it with a little salt peter and it
will be very pure bright silver — There is
no loss of gold in this last process if the aqua
fortis be poured off carefully. The loss on the
last is about $\frac{1}{3}$ that of silver already mention-
ed — This last process is the best for Dollars
them being less waste, and in India probably
less expensive

until the crust on the metal disappears
Having put enough on and the furnace running
slow, lower the gutter end of the bar by the one screw

At last when the furnace is nearly run off,
which is easily known by the oily matter dis-
appearing, if the heat happens not to be strong
enough to keep the silver in fusion, the silver
will not be quite fine, but will still and leave
furnace on the top of it. But if the fire is kept
up and the heat sufficient, the furnace will run off
and leave the silver fine. It will shoot up from
the surface in various forms, half an inch high.
This is called springing by the workmen, a sign
of its being fine or nearly so. Lower the fire
and when the silver white rises it from the bar
with a roller, for if left till cold it will be difficult
to separate it from the rest. If it is wanted particu-
larly fine it must be melted in a pot with
a little Salt Peter, as there is always a small
quantity of noise. The bottom for this furnace
should be 30 inches broad. Double-rozge. It is
brought by a woman Kachin. like Smeth's is
- 1000 lb. may be wrought off an one on this fur-
nace. Keep the gutter always open.

205. A solution of Alum retards the purification
of almost all substances. This is an excellent
and very cheap way of preserving natural pro-
ductions which are sent as specimens from one
country into another. F-7

206. Without the help of Alum no colors
would be permanent, or good against water.
F-7 5 105

207. Triturate 50 grains powder of Sulphur, 369
very dry powdered charcoal of willows, and 3
of common Phosphorus, in an iron mortar, the
result is a good Cyphorus. J. D. Physique

208. A citreous-colored ointment made up
of hog lard and the Nitrous solution of
Mercury is an excellent cure for the itch.

209. The monsoons in the Indian seas
almost always give way to the sea
and land breezes near the shore. A
happy circumstance to the inhabitants.

290. The Katakata of Strabo, now Calcutta Bay was the first harbour in India in which an European Fleet was made - Alexander first Com: by Nearchus - situated a few miles to the W. of the W. mouth of the Indus -

291. Several travellers have remarked that where palm trees grow, however arid the soil, there is always water to be found by digging 10 or 15 feet -

292. The largest vessel in the Nearchus's fleet probably did not draw more than 6 feet water -

293

294 The circumference of the Earth according to Eratosthenes = 252,000 Stadia
- Aristotle = 400,000 Paces
Aristotle's Stadium to that of Eratosthenes as 250:400 that is as 5 to 8 nearly - This is a much more exact proportion than that of 4 to 7 which makes Erat: Stadium too large by almost $\frac{1}{9}$; whereas the :: 5:8 makes it too ~~large~~ large by no more than $\frac{1}{120}$

Roman foot to English as 97:100
hence Roman foot = 11.64 inches
- Papyrus = 3 feet = 4.10.2 English
Roman Mile (miliaria) = 1000 papyrus = 7 furlongs
76 yards 2 feet = 4040 feet English

(all the Roman papyrus & the miliaria M. and the St. Stadium S from Polybius as quoted by Strabo

$M = 8S + \frac{1}{3}S$ - Hence $1250 (= \frac{1}{8}M) =$
 $S + \frac{1}{24}S = \frac{25}{24}S$ - Hence $50 = \frac{1}{24}S$
and

Section	$\frac{7}{2}$
Est. Height	4.1
Height of Grate	1.0
Grate to Dome	1.0
Masonry of Dome	0.9
Height of test bars	1.4 $\frac{1}{2}$
Thickness of the two bars each	0.12 $\frac{4}{4}$
Thickness of test	0.4 $\frac{1}{2}$
Dist. From base of fire place to mouth of grate	0.9 $\frac{1}{2}$
Height of mouth of grate	0.9
Masonry to lower top	0.0
Height of first flue	1 $\frac{1}{2}$
Length of Lead trough	1.9
Length of chimney flue horizontal	1.9
Lead trough square	4 $\frac{1}{2}$

The chimney flue goes down to the bottom - as in shown - The test ring is an oval having a little gutter and hole at the smallest end - The test is supported on a plate of cast iron against which two screws press to raise it to the pitotape height - The screws go through the two iron bars - The bars for the peaking stove grates are as usual packed above -

Fire place (Dimensions
 of Furnace -
 East: ^{Class} Length - 2' 1/2
 - Breadth - 7-6
 Masonry to grate - - 3-9
 Brⁿ. of Grate - - 9
 Length of Chimney - 1-1
 Mason: to Chest - 1-2
 Breadth of Chest - 1-9
 Length of Chest - 2-5 1/2
 Mason: from Chest
 to Chimney - 1-1
 Breadth of Chimney
 Flue - - 9
 Mason: from Chim. Flue - 9
 Door of fire place in
 front - 1-1
 Ditch at grate - 5 1/2
 From door to grate - 9 1/2

and $120 P = S$ -

Name S or Olympic Stadiums = 502
feet English or 194 yards
Olympic Stadium = $0.110227\frac{1}{27}$ Miles Engl-
 $0:5 = 0.110227\frac{1}{27} : 0.060092045\frac{1}{45}$
Name Aristotle Stadium = $0.060092045\frac{1}{45}$
Miles London ~~was~~

- Greek foot was supposed to be to the
Roman as 25 to 24 - It is more pro-
bable that they were the same, that
the Romans adopted the Greek foot -
- If the Roman foot was what Polyb:
makes it $0\frac{1}{5}$ Olymp. Stadium, the length
of the Stadium turns out exactly 120
Roman paces \neq to 600 Roman feet.
And since it was also 600 Greek feet
the Greek and Roman foot must have
been the same.

295.

Revivings of the Constellations -

- Cornucop - at Sun rising
- Astrucut at Sun's setting
- Nebucut - both at near the sun
- + Cornucop affected by the Lat of the place
and Declination of the Star - Astrucut the
same - Nebucut also by the state of the
atmosphere and brightness of the Star -
- In N. Lat with Star to North: of the sun
the time of the Stars rising ^{locally} happens a
few days sooner than that of its setting. Asti?
- Star invisible at either of the two first
risings and settings -
- + Precession of the Equinoxes occasioned by
the oblique action of the sun and moon
on the equatorial parts of the earth - This in-
creases the Long of every Star $50\frac{1}{5}$ in the year
- no change in the Lat of the Star - Chang-
ed declination, because the motion
of the Equinoctial points is in the plane of
the Ecliptic. - Hence the risings &c are later
now than in former ages -

In 1760 Dr. Bradley determined the
 Longitude of Lucida Pleiadem to be
 $82^{\circ} 30' 34''$ and Lat $4^{\circ} 1' 36''$ North
 Hence at this time (1760) in the Lat. of Rome
 the Pleiades rise comest on or about the
~~10th~~ 10th May, and set astronomically about the
 20th of the same month. And they rise
 astronomically about the 12, and set astronomically
 about the 21st Nov. The two last took
 place according to Columella on the
 10th of October and 8th of Nov in the year of
 Christ 42

— Calculation —

1760 Long: R. Plei: — $82^{\circ} 30' 34''$

$\frac{1760}{1710}$ precep: for which is — $28^{\circ} 1' 12\frac{2}{3}$
 Long of the Star = 42 — $2 37 21\frac{1}{3}$

Pl. of Cap: which rose with the Star was $\vee 29, 7, 9$

Obliquity — $23 41 24$

Point which set as star rose $\underline{\underline{=}} 29 7 9$

By Meyer's Tab: sun in that point on
 the 19th of Oct. By a similar precep the Cos: setting
 was $m 4^{\circ} 20' = 29^{\text{th}}$ of Oct —

The former of these differs more and the latter
 ten days from the former as given by Columella
 Cause. It is highly probable that the evening
 and setting mentioned by Columella show
apparent, and consequently the one might be
 sun nine or ten days before, the other as
 much after the ^{time} true. This correction brings

the Colant: and Columella's time to agree —
 Strabo says "Pleiades sailed from the
 Indies at the season when the Pleiades rise
 in the evening". Arrian informs us that
 it was on the 2 October 326 years before
 Christ —

From 326 before and 42 of Chr: precep = $5^{\circ} 0' 42\frac{2}{3}$
 which subtracted from $82^{\circ} 37' 21\frac{2}{3}$ the Star Long
 in 42 leaves $\vee 27^{\circ} 20' 30\frac{2}{3} =$ Long in 326 A.C.
 Obliquity of the Ecliptic in 326 A.C. = $23^{\circ} 44' 13''$
 Point of the Eclipt: which rose with the Star was
 $\vee 19^{\circ} 26' 41''$

The Opposite the same in Libra = 17 Oct.
 326 A.C. fifteen days later than Arrian's Date

It is highly probable that Strabo spoke in general terms pointing out only the season of the year, and that the apparent rising was meant, but in this case it must be remarked that if nights in nine days were sufficient to render the rising of the Pleiades ~~apparent~~ visible at Rome no more could be necessary at the mouth of the Indus — Diff: of five or six days too much — True calculation are founded on the Julian style, which was not introduced till about 45 years before Christ. Diff: mode of computation used before that From 326 A.C. to 42 A.C. space was found to be $5^{\circ} 0' 42\frac{2}{3}$ a space which the sun is more than five days in passing over, it may therefore be supposed that the diff: of the risings should have been made five or six days, whereas it is made less than two, but it must be considered that near three of these days are anticipated by the leap of the Julian about the true tropical year —

from

Some Subject by Dr. H. G. —

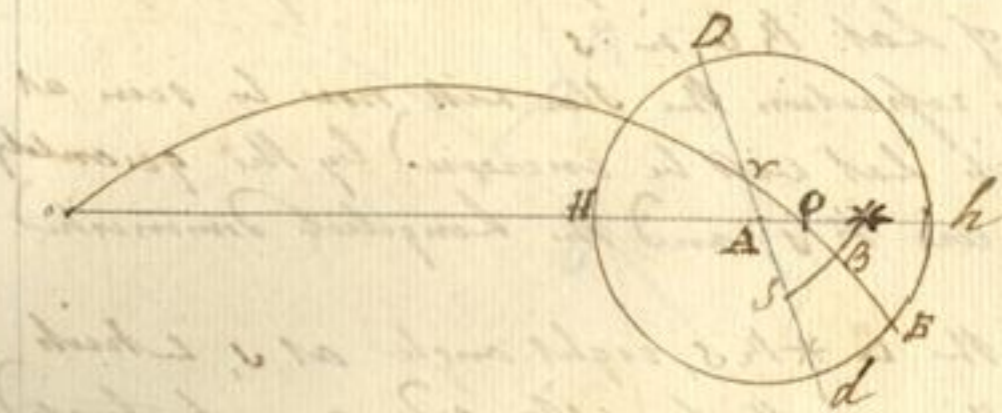
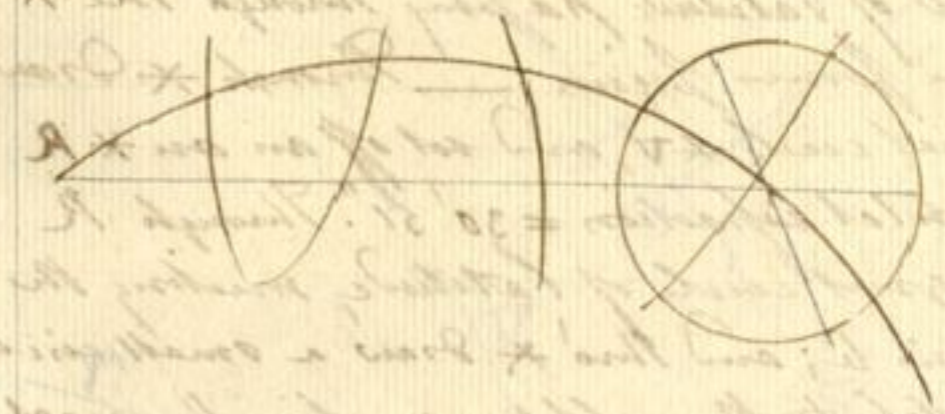
Strabo says "The fleet sailed in Autumn
 " about the season of the evening rising of
 " the Pleiades, before the winds were fair, the
 " Barbarians attacking them, and forcing them
 " to sea" — These are also Strabo's own words
 and are such as might be supposed to be
 those of a Journal. A more proper writer
 would his like have mentioned the particu-
 lar day — They saw the Pleiades on the
 East about an hour after sun set probably with
 that latitude, that they concluded it had arisen
 at our set.

	Comp:	
1. Lat	of Luinda St. by Bradley	$8^{\circ} 26' 30'' 34''$
1760	Lat	4 - 136
	Lat of mouth of the Indus	24 -
Int. b ^{ty}	of 1760 and 326 A.C.	Julian yr. 2005
	Ob. of the celestic	25 44 14
	Revol ⁿ of Eq: 5 ^m	$29^{\circ} 7' 35''$ 27 30 39
Therefore	Long: Luind: A.C. 326 was	27 30 39

Let HAh represent the horizon, DAE the Equinoctial and YOE the ecliptic all projected upon the plane of the Meridian of the mouth of the river at the instant when Lucida Placidia is rising. Let the eclip: intersect the horizon on the eastern side in O and on the western side in o . Let $*$ be Lucida $P.$ upon the eastern horizon. Then O will be the point of the Ecl: that rises with the Star; and the opposite point o in the west will be the point which sets when the Star rises.

— Third $*$ Draw a great circle of Lat: $*B$ meeting the Eclip: in B and the Equinoctial in S . — Then in the Δ $*BS$ given $\angle B$, $\angle BS*$ = $23^{\circ} 44' 14''$, the side BS the Longitude of $L: P.$ = $27^{\circ} 30' 39''$ — by resolving the Δ , the $\angle BS*$ will be $69^{\circ} 4' 57''$ and the side $*S$ = $11^{\circ} 28' 56''$.

But the Arc $*B$ is the Lat. of $L: P.$ = $4^{\circ} 36''$, and $*S$ = $*B + BS$ = $15^{\circ} 30' 32''$. Therefore in the Δ $*SA$ we have the side $*S$ = $15^{\circ} 30' 32''$, the $\angle *SA$ or $BS*$ = $69^{\circ} 4' 57''$, and $\angle *AS$ the Comp: of Lat. of the place = 66° . Hence by Δ : $*SA$ = $48^{\circ} 24' 29''$. The arc of this last Δ is from the effect of the Δ refraction — as follows.

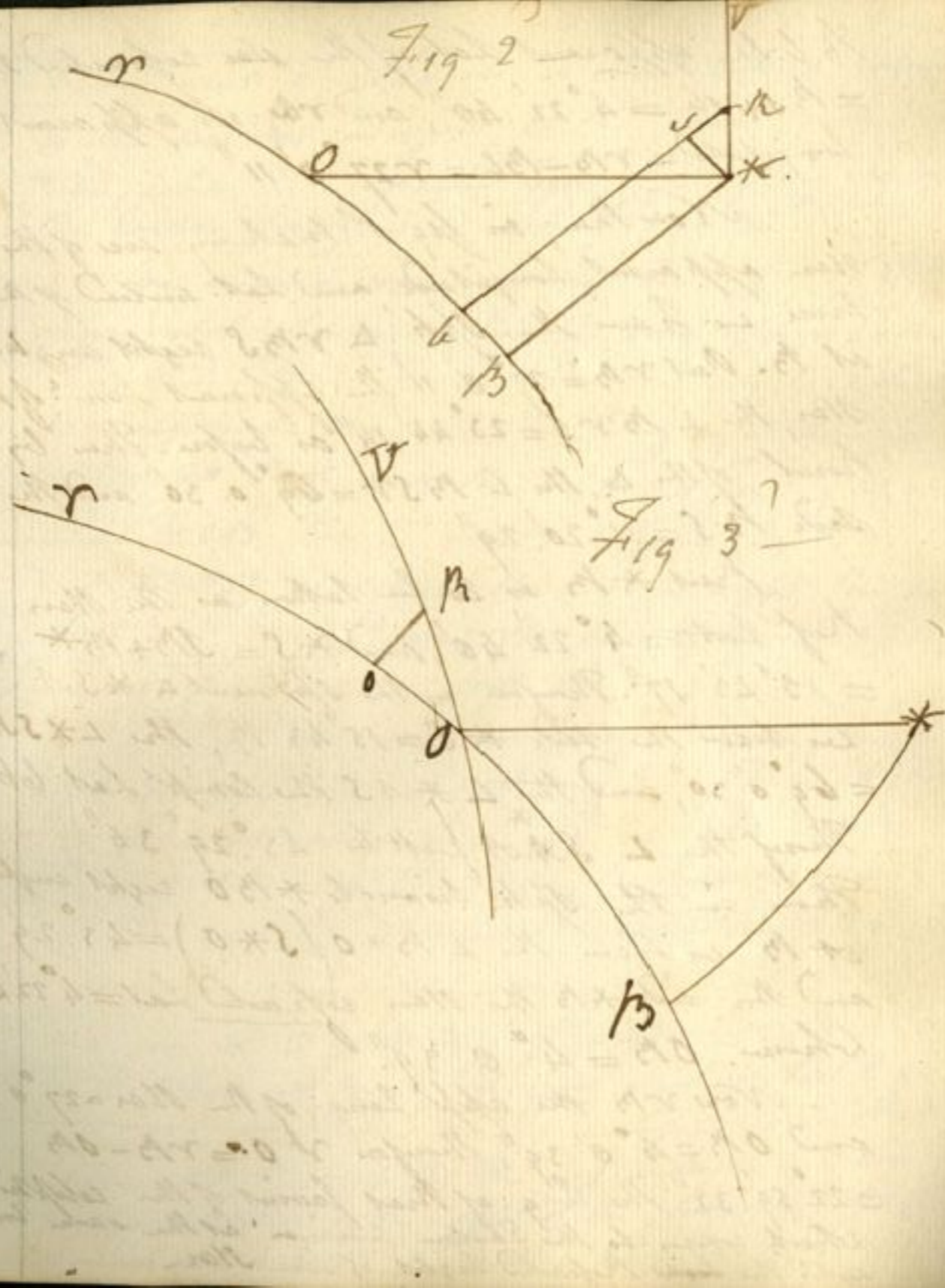


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In fig: 2 Let O^* OB and $*B$ represent
 the same arcs of the ~~celestial~~ Horizon, Ecliptic,
 and circle of latitude passing through the $*$
 in in the former figure — Through $*$ Draw
 a vertical circle $*V$, and set off an arc $*R$
 $=$ horizontal refraction $= 30' 51''$. Through R
 draw a great circle of latitude meeting the
 ecliptic in b ; and thro' $*$ draw a small circle
 $*s$ parallel to the ecliptic meeting the great
 circle of Lat: Rb in s

By refraction the Star will now be seen at
 R , its Lat will be increased by the quantity
 of the arc $*R$, and the Longitude diminished
 by Bb

In the $\triangle *Rs$, right angled at s , which
 from the smallness of its sides may be treated
 as a rectilinear triangle, the side $*R = 30' 51''$,
 $\angle R*s$ which with $s*O$ makes a right
 angle, must be equal to $O*B$ ($A*s$ of Fig: 1st),
 which with the same $s*O$ makes a right
 \angle : Therefore the $\angle R*s = 43^\circ 24' 29''$ — Then
 by the Prop^{ty} of the \triangle the side $R*s = 21' 12''$, and the side
 $*s = 22' 24'' =$ the length of $*s$ in parts of a great
 circle — whence Bb will be found $22' 28''$ — Hence



κ is the apparent Lat. of the star refracted star
 $= \kappa_s + s_b = 4^{\circ} 22' 40''$, and r is its apparent
 longitude $= r_{13} - 136 = r 27^{\circ} 0' 11''$

Now then, in fig 1 making use of the
 star apparent longitude and lat. instead of r
 time we have the sph: $\Delta r_{13} S$ right angled
 at r_{13} . Put $r_{13} = 27^{\circ} 0' 11''$ the apparent long: of the
 star, the $\angle r_{13} S = 23^{\circ} 44' 14''$ as before. Then by the
 Prop: of the Δ , the $\angle r_{13} S r = 69^{\circ} 0' 30''$ and the
 side $r S = 11^{\circ} 20' 29''$

Put κ is to be taken as the star
 Ref: Lat: $= 4^{\circ} 22' 40''$, and $\kappa S = 13 + 13 \kappa$
 $= 15^{\circ} 43' 17''$. Therefore in the sph: $\Delta \kappa S A$
 we have the side $\kappa S = 15^{\circ} 43' 17''$, the $\angle \kappa S A$
 $= 69^{\circ} 0' 30''$, and the $\angle \kappa A S$ the Compl: Lat: 66°
 Thus the $\angle S \kappa A$ will be $43^{\circ} 29' 34''$

Then in the sph: triangle $\kappa B O$ right angled
 at B , we have the $\angle B \kappa O (S \kappa O) = 43^{\circ} 29' 34''$
 and the side κB the star refracted Lat $= 4^{\circ} 22' 40''$
 Whence $O B = 4^{\circ} 0' 39''$

Now r_{13} the app: long: of the star $= 27^{\circ} 0' 11''$
 and $O B = 4^{\circ} 0' 39''$, therefore $r O = r_{13} - O B$
 $= 22^{\circ} 59' 32''$ the long: of that point of the celestie
 which comes to the Eastern horizon at the same time
 with the light refracted light of the star.

The point o opposite to this which comes
 to the western horizon, at the same instant of
 time, when the refracted light of the star is upon
 the Eastern horizon is $= 22^{\circ} 59' 32''$

We must now estimate the effect of the
 horizontal refraction upon the semi apparent
 Longitude. This depends upon the angle which
 the celestie makes with the horizon, at sun rise
 or sun set that is on the $\angle v O A$ (fig 1) or its
 equal $\kappa O B$. The $\angle \kappa O B$ is found by the
 sph: $\Delta \kappa O B$ in which the $\angle B$ is right, the \angle
 $\kappa O B = 43^{\circ} 29' 34''$, and the side $\kappa B = 4^{\circ} 22' 40''$
 Whence $\angle \kappa O B$ comes out $46^{\circ} 39' 59''$

Now to avoid confusion draw the
 sph: $\Delta O \kappa B$ by it self (fig 3) show O draw
 a vertical circle $O V$, and take the arc
 hor: refraction $= 30' 51''$. Through K draw a great circle
 of Lat. and let it meet the vert: circ: in the
 point o . Then the sun when early on the
 horizon at O will by Ref: appear at K . The
 light appear at K in the great circle of Lat: $K o$.
 o will be true place in the celestie, and the arc
 of the celestie $O o$ will be the Diff: between true
 apparent place or the effect of the horizontal Ref:
 on the apparent Longitude.

In the triangle KOo which for its smallness
 may be treated as a rectilinear triangle, the
 angle at o is a right angle, the angle KOo is
 being the comp^t of $\angle O'P'o$ is $43^{\circ} 20' 3''$ and the
 side KO is $30' 51''$ horiz^l refⁿ. - Then oo comes
 out $22^{\circ} 26''$ = the effect of the horzont refraction
 on the rising sun in app^t long^t, his true
 place being O in Lat $24^{\circ} N.$, and the same
 will be the effect of the setting sun in the op-
 posite point of the ecliptic in the same lat.

The effect on the rising is always the same on
 the opp^t point of sun setting because opposite
 points of the ecliptic make equal angles
 with the horizon and on this the effect of
 refⁿ depends. The effect lies in opposite
 directions, the app^t in raising the apparent
 longitude of the sun west of his true place,
 and the app^t long^t of the setting sun east
 of his true place - Hence we must put the
 sun's true place $22' 26''$ west of O. Therefore

$\Rightarrow 22^{\circ} 59' 32'' - 22' 26'' = 22^{\circ} 37'$ the app^t place
 of the sun at the birth of Lucius Pleid^{us} in 326 A.C.
 by Meyer's table = Oct. 19th 10 25 9^h 15^m 9^s Just. Sley
 mean time Mer: Greenwich To this add refⁿ
 from the legend of the year "at Oct. 19th = + 16'' as

the sun's place was deduced from the longitude
 of the star. Add also $\Delta 36$ = Diff. Merid:
 between J. and the mouth of the Indus and the
 result is Oct. 19th 15 17 mean time by the
 meridian of the mouth of the Indus.

4300 y. Jul. P. 326 A.C.
 + As the real act. rising cannot be ob-
 served in actⁿ of the twilight, and as a
 star of the 3^d mag. (L.P.) requires the sun to
 be $14'$ below the horizon that its actⁿ rising
 may be perceived - Then the sun's longitude
 when he was $14'$ below the horizon will be found
 to be $\approx 3^{\circ} 33' 56'' = 30^{\text{th}} \text{ Sept. } 12 59^{\text{th}} \text{ Jul. } 30^{\text{th}}$
 app^t as from "the long^t for precessⁿ + 15'' and $4, 36$
 for Diff of merid; and then results Oct. 1 5 50 am
 mean time under the meridian of the mouth of the
 Indus - This corresponds perfectly with Strabo.
 - From this the apparent rising and setting
 must always have been meant -

The reckoning the year before Christ is set
 down with precision, but in Astronomical tables
 In Meyer's table the year of Christ 0 corre-
 sponds with with the year of the Julian Period
 4713, but this Chronologer call the year 1 before
 Christ at the same time they call the next
 succeeding year viz 4714 the 1 after Christ.
 By this inaccuracy they make the interval
 between any day in the one and the correspon-
 day in the other 2 years instead of one

E. Year before Christ 326 = 4300 J. P.
 year after Christ 1760 = 6473
 2006 = 2005 Jul. year

This example shows the error - The first is
 by the tables and is one year too much; the
 other, by the Julian is correct. —

+ There is very seldom an exact astronomical
 rising of a Star at any place, because it very
 seldom happens that the instant of the Sun's
 appulse to the equinoctial point in the ecliptic,
 and the instant of Sun set are the same.
 The same with the longest and shortest D.,
 and Settings. Take the nearest Day —

296. Remarks on Dr. Wren's compound
 Screw —

Let c be the circumference of the circle
 described by the power P , and let the distance
 of the threads of the great and small screws
 be d and d' respectively. Then if P be applied
 at any given distance from the center of the
 screw AB to move it round its axis, then will
 $\frac{cP}{d}$ express the force acting upwards at B .
 Now if we conceive AB to be a hollow tube
 into which FE may pass freely without
 any being affected by a female screw, and
 let FE rest on an obstacle connected with
 the tube, which obstacle shall sustain a
 pressure equal to $\frac{cP}{d}$ applied at F , supposing
 F to meet with resistance in its motion up-
 wards by the cross plate $2y$: this obstacle
 is, consequently a resistance equal to the force
 at B , by supposing it just sufficient to oppose
 the pressure at F . Then far with respect to
 the simple screw AB . Now if the pressure
 $\frac{cP}{d}$ at F be supposed constant, or which is

The same thing, let a weight be placed
 at F , equal to $\frac{CP}{d}$, and then the second
 screw applied, then in case AB would move
 round its axis, without having any pro-
 gressive motion upwards, that is, suppo-
 sing the screw to be immovable ~~and~~ the
 tube to rest on the plate CD , and turn
 on an axle from it which CD sustains
 the weight $\frac{CP}{d}$, then under those circumstances
 F would be forced down by the inferior
 screw against the obstacle in the tube
 with a pressure that shall be to the weight
 $\frac{CP}{d}$ as the circumference of the circle de-
 scribed by the power is to the distance be-
 tween the threads of the smallest screw: or in
 other words, the pressure of the weight $\frac{CP}{d}$ will
 be increased to $\frac{PC}{d}$, for while AB moves
 round its axis, without a motion upwards,
 the female screw would act on the edge
 of the threads of the inferior screw,
 and consequently force it down. But while
 AB continues to be acted by its screw
 and to have a vertical motion, the

weight at F is sustained by the two
 screws in place of the one AB , and the
 small screw not having any circular motion
 slides thro' AB , while AB slides & ascends:
 but the force is only affected by the screw AB
 in passing thro' the space CD : For these two
 screws are similar to two inclined planes,
 when a weight is drawn up one plane,
 while that plane is sliding down another
 either parallel to, or making a given angle
 with it, a circumstance, exclusive of friction
 that never will affect either the power or
 weight; for it is immaterial whether a weight
 be drawn up a plane at rest, or a plane
 be drawn ~~down~~ under a weight at rest, so long
 as the power applied to sustain that weight
 preserves the direction in which it was at first
 applied. Neither will it signify, if while the
 sliding plane is moving down, the weight in
 the mean time be moved a little upwards,
 and so gain in its perpendicular height,
 and this reasoning will apply to the case
 in question, for if the threads of the smallest
 screw are at a less distance than those of the
 large one, the weight at F will ascend because

More perpendicular height has been
gained thro' CD than has been lost at B
in one revolution. Now if the Distances
of the Threads in each screw be the same,
then F will remain at rest, and yet the
pressure or weight there will be the same
and it will require the same power to
move AB round its axis, as if the entire
Screw were free to move with AB , and
from the same circuit as well as pro-
gressive motion. So that whether E & F move
Downwards as fast as AB moves upwards
so that F may be at rest, or whether
 F move with the same velocity as B ,
it matters not as to the force at F : and
like wise if E & F move up, so that F may
have any velocity upwards less than B ,
it can never affect the force at F , when
friction is not taken into consideration.
But friction here must be great, because
there will be the same friction in CD as
if it were but a simple screw, for the
ultimate pressure is there, and the

action of the small screw, being retarda-
ly in opposition to that of the other the
friction will therefore increase the parts of the
whole. So that, if this reasoning be right,
this compound screw cannot answer the
purpose intended as to force, having in its
friction no advantage over the simple
screw, while every defect arising from friction
will be against it —

Extracts from Dr. G. S. account of
the China Embassy

— China proper —

Population — — — — — 333,000,000

Square Miles — — — — — 1,297,999

E. Acres — — — — — 830,719,360

Revenue rec. into the Treasury —

Cash — Tahels & ounces of Silver: 36,540,000

Measures of rice and other grain — — 4,245,000.

Rough calculation of the military
establishment of China —

1,000,000 Infantry at 2 Tahel Tahel
& month provisions included 22,000,000

800,000 Cavalry at 4 Tahel & M^c
provisions include — — — 30,400,000

All expenses yearly — — — — — 10,600,000

43,000,000

Salaries of military officers — — — — — 1,974,450

74,974,450

Salaries of Civil officers 2,960,000

China trade

Exports to China for 21 years ending with 1795

In goods	6,909,460
Provision	3,676,010
	<u>£ 10,585,470</u>

Tea exported from China

1776 Total foreign	£ 16,410,900
Total English	13,400,691

1700 Total foreign	10,267,400
Total English	17,991,032

1705 Total foreign	5,577,200
Total English	23,733,010

NOTE. The great increase of British exports from Canton in 1705 arose from the commutation act -

King's Duty on tea from 1st Sept. 1704 to the 1st March 97 = £ 4,032,109

from 96 to 97	£ 705,572
— 05 to 06	292,193

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Mode of calculating a Lunar Star
by Capt. N. —
abridged

1. Take the Diff. up: all from Vert: and sub-
tract the remainder from the app. Vert.
There remains a residual arc
Take the Log sine of half the Diff: and re-
sidual arc, rejecting their indices of 9, but
if under nine, take their complement to 9
as the proper Index, which index is always
negative, and must therefore be deducted
from the index of the Log: of reduction
2. With the moon's app. Altitude in Degree
and Minutes only, and her horizontal
Dist: take out the Log: of reduction of Par:
and Ref: from the Lunar Tables, to which
add the Log sine of half the Diff: and Resi-
dual arc, their sum is a common Log:
find the corresponding Number which shall
remain

3. To be the proportion at Log: of the
 moon's horizontal Par^l, the Sect: of
 the moon's app: altitude to a place re-
 jecting the index, add them together, and
 in the table of proportionat Log: find
 the number and seconds, from which sub-
 tract the refraction of the moon's apparent
 altitude; the remainder is the correct: of
 the moon's altitude. If the moon's alt:
 is less than that of the sun or star, this
 Cor: is to be subtracted from the Diff: of the
 app: altitudes and v.v. added.

The note must be observed respecting the
 Prof: True altitude, in order to obtain the true
 Diff: of altitudes

A To the Log: found by 2. add the
 Nat: Versed Sine of the difference of the
 true altitudes found by the last article,
 the sum is the Natural Versed Sine
 of the true Distance chord of N. & Par^l.

Example

O; app: alt.	33° 53' 34"	D; N. P.	54' 36" - 5101
D; Table	32 0 56	Dist	0722
Diff	1 44 0	P. Log	46 14 590
ap: Dist:	03 30 53	D; Ref:	1 31
$\frac{1}{2}$ Diff	01 54 15	44 43	Cor: D. Alt
Rem: sine	42 41 46	S.	0.016524
Log Product			0.831300
			4 297549
		Cor: Lon	5.945373
001006			0 1
		Diff: ap. alt	1.44.38
		Cor: D; alt	44 47
		O; Ref: alt	1 24
000145	N. V. Sine	Diff: T. alt	0.50 31
001951	N. V. Sine of T. Dist		03° 13' 14"

298. It appears from a series (22) of lunar observations taken at Greenwich Obs: in 1791, on purpose to determine to what degree of accuracy the longitude may be found by this method, that the time elapsed from the observed distance of the moon and sun or star, was less than that by the clock and if a mean of the whole be taken it amounts to 52 seconds = 13 minutes of Longitude that is - East and + West. This error seems to arise from the dip being set down 30" of a degree too much to the Eastward in the Ephemeris.

299. It has been calculated that four hours labour in the day, by every individual would be sufficient to produce all the necessaries and comforts of life for the whole Society.

300. The horizon is one of the most useful circles of the Sphere and the only apparent circle. To this belong all the celebrated phenomena in respect to the motion of Day and night - risings and settings of the heavenly bodies - Altitudes &c.

301. I have often considered that a region which had the best temper for Europe, was too soft in India. I find the sun observations made on journey took by Mr. A. G. - gave would the same degree of artificial heat produce the same effect in Europe? If not give the reason.

29
302. What is fog? and what material does
it contain that so much affects the eyes?

^{qu.}
303. How are the Diff. Gases different respects
power, how is this to be ascertained?
qu. would not this lead to some discovery
respecting the Atmosphere?

304. Some plants in this country will not thrive
but by the culture of the air - some for
example must be enclosed - Is not this
a proof that there is some other de-
struction ingredient exists in the Atmosphere?

305. What are the best experiments to
ascertain the existence or non existence
qu. of Nitrous gas in the Atmosphere? -

306. A mountain in Tibet is said to have
been seen at Madra = 300 Miles distance!!
This would require a height equal to about
12 miles. If the above assertion can be de-
pended on, the refraction of the Atmosphere
must occasionally be much greater than
commonly supposed - This was related
to me by Capt. ... who has seen the moun-
tain from Madra - also by M. Carey -

307. The skinmings of Glass in fusion
(sandiva) thrown into water produce a
violent explosion. N.B. The Athlete
used in making the glass must be far
Keif for this experiment -

300. The pendulum rods of some regulators
are made of brass tubes. Query what
is the proportion of expansion between
a tube and a rod of the same length?
- The bell is also made cylindrical
- Query what advantage has this over the
common form -

309. Can any instrument be constructed
on the principle of Hadley's Sextant to
give the angle on the limb equal to
that measured by the center Speculum
or without the angle of the limb being
doubled? J. Walker says Mr. F. has
constructed a model of an instrument to

effect this — I think such an effect
will be inferior to that in common use
— D. Kowal's Circular Instrument doubles
the angle like the sextant. It has
two indices with a mirror on each
one carries the Horizon glass, and the
the other and the telescope; the other index
carries the centre of spectrum and has no
connection with the horizon spectrum

310. It seems doubtful whether the public
good, or anxiety, as it should more properly
be called, has increased beyond the ratio
of improvement, and the decrease of the
value of money — It is probable that
it was a less proportion to the gross
revenues of the country now than at any
former period —

311. A person bit by a mad dog continues
in health generally for 20, 30, 40 days
or even a much longer space of time
The bite, if not prevented will in general,
be healed long before that time

The Hydrophobic seems to be a symp-
tom of Canine madnes, peculiar to the hu-
man race, for the mad animals which
communicate the infection do not seem to
have any dread of water — Cattle bit by
a mad wolf dying nearly under the same
symptoms as the men and women, but

without exhibiting any signs of
Hydrophobia.

All other dogs avoid and run away
from one that is bit. The largest
will not attack the smallest of
the latter be infected. To discover
whether a dog (Maddy Rith) was mad
rub a piece of meat along the inner
of his mouth, offer it to another dog,
if he eats it, the dog was not mad,
if he rejects it with a kind of bawling
noise, it is certain the dog was mad.

The convulsive fits of the Hydrophobia
consist on every character of an human ac-
cording to Doctor Wolf of Warsaw.

The Dogs voice is altered much in
tone as the disease increases.

The human patient blows the foam
out of his mouth with great force
and noise somewhat resembling
the barking of a dog. There probably are

^{relatives}
the ~~accident~~ given of patients, barking
like the animal which bit them. —
A hot steam and want of water
are two causes assigned for Canine mad-
ness. But this cannot be true, for in
the island of Antigua where both pre-
vail, the Hydrophobia is said to be
unknown —

312. The Church of St. Jermi at Constantinople
is said to have been built by Const. the 5th.
The Turks have converted it into a granary
Armory - It is said to contain the
Roman Military Engine used by Alexius
at the siege of Nicea in 1097. and the
Arms and weapons of the Crusader
which might may probably be thrown
in ancient war by an inspection of the
Arms

313 The Greek mariners are totally igno-
rant of the modern Art of Navigation nor
have they any acquaintance with Nauti-
cal instruments. Except certain improve-
ments in the form of their boats, they seem
to have learned nothing more from their
Genoese and Venetian Masters. It is doubt-
ful whether they really exceed the Argona-
les in Nautical Skill -
Their two words for Deloway

314 No Domestic in Constantinople performs more than one office; this serves the coffee, and that hands the Mevlevi, but no emergency can command any other service
Dallaway

N. B. Mr. Abbott says the above is a mistake, and that the servants in Turkey turn their head to any thing

315 The length of the pipe is in proportion to the dignity of the Smoker, often being feet. The head of pipe is made of Siam wood with the bark preserved, the bowl of a delicate red clay, and highly ornamented. It is carried from place to place by two servants, with much ceremony, and the bowl is supported on a stick.

316 The Turks have the shew of belief in witchcraft, particularly in an evil eye.

317 The Instrument which is used for the service of their Circassian music has much resemblance among the Jews.

The lower class cannot learn a second part to any tune. This was the case with Matrocks beyond the first strain of which they could never go, tho' they had adapted to it words in their own language.

318 Dogs are said by Dallaway to be subject to the plague at Constantinople - Canine madness very rare.

319 Some years ago no Turk could walk the Streets of Constantinople without being liable to insult; but since the peace with the Russians 1794, when Prince Repnin paraded the Streets with 600 Soldiers with drawn sword, the treatment of foreigners is much altered, their insolence much humbled.

320 Opium is made up with various other articles, composition is called Mesh Allah, the work of God, or a word to Allah "well done, in Heaven."

321 Considering the population of Canton
temples, Capital punishment, are
very rare - Generally happens among
the military. There is no place of
public execution, the criminal is led down
the nearest street by the Executioner
who is provided with a large mat
and laid, which he places over the door
of any shop where he is not paid for
his forbearance! - ~~About~~ a few
inches from the ground, the body must
be left untouched for three days.
In instances of decapitation, the man
honorably from retirement, it is exposed
the same number of days with the
head under the arm or between its
legs -

322. Elephants have been seen in the
act of Copulation in the
enclosure in which they are taken wild
and the female brought forth in 22 months
after -

323. Cock roaches, it is said have been known
to eat arsenic which had been pre-
pared for killing rats, without ^{experiencing}
any inconvenience!!

324. When a prisoner of Hindostan writes a
letter, which he wishes to have forwarded
by express, he encloses it in a red bag.

325. M. Amiot, in the memoirs of his
C. a description of the manner of making
the Chinese Gong
consists of Copper 10, Tin 3 and Bis-
muth 1 - Trade of Mammaring -

326. Method of cleaning mercury by agitating
C. violently in a strong phial held by both
hands, inverted the lower hand shaking ag-
the brass - 20 or 30 strokes, after which the

The clear mercury is to be let out
and the ~~bottom~~ ^{residue} ~~is~~ ^{is} preserved as
prepar'd till the mercury be com-
pletely gone. The process is founded on this fact that
the metals, with which mercury is gene-
rally ~~found~~ ^{found} contain water, become con-
vert'd into a black powder, by a proce-
dure when agitated with respirable
air. Nichols - Journal of N. Am. 4

327. The Foxes of Sampson. M. Hapselgunt
says ~~and~~ ^{and} Jackals, and ~~where~~ ^{where} the word
occurs in Scripture, it ought to be so
translated. - These animals collect in
great numbers ^{at night} in all the cities of the
East, through all Asia. "Zion is deso-
late, the Foxes walk upon it,"
- The Jackal is less than the wolf
and larger than the Fox -

328. Herons and Forks are unknown
in China, Hindostan, Turkey, Greece, and
probably to all the Eastern nations.

329. Fire Drappers frequently, at Constantinople
when a fire has burnt one town, the Sultan
is obliged to attend in person bringing with
him much good bread with fragrant herbs
he distributes with his own hand ~~among~~
among the fire men, who are very in action
before his arrival: the women assemble in
a group near the Sultan, unmercifully
tear him with the bitterest reviling, and
charge him with the cause of their present
calamities. As this is the only permitted
line of conveying the voice of the people
to the his ear, and as women in Turkey
say any thing with impunity, it is pre-
sumed that many of the fires are not ac-
cidental.

Deloway; Constant;

330 It is remarkable that notwithstanding
the prodigious number of dogs at Constantinople,
canine madness is seldom known there, tho' the dogs subject to the plague.

331 The same Author
of the blood, while flowing from a vein
be abstracted it is turned to so fixed a
black colour that exposure to oxygen will not
restore the bright red - The converse
is also true, that if the blood which has
been rendered bright red be abstracted it
generally is rendered black.

332 Evergreens have leaves of a different texture
than deciduous plants. The latter give out
little or no oxygen gas when the weather
gets cold, whereas the former give
out pure air through the whole year -
The leaves of deciduous plants absorb
moisture during the night then freeze in
in the veins of the leaf, destroy the organiza-
tion, and the leaves consequently fall off -

333 What is the cheapest and best com-
position for smothering a ship in order to
kill rats? -

334 On the 16th June 1794 a tremendous
cloud was seen in Tuscany near Siena
coming from the north about seven o'clock
in the evening - Sending forth sparks like
rockets - throwing out smoke like a furnace
- sending violent explosions and shocks, more
like those of cannon and of numerous
muskets than like thunder - and casting
down to the ground hot stones, whilst the
lightning that issued from the cloud was
remarkably red, and moved with less velo-
city than usual - The cloud appeared of
different shapes to persons in different situa-
tions, and was ^{described} as a long bar; but every
where was seen to be burning and smoky
like a furnace - Its height seemed to be
much above the common region of the clouds.

The wisdom in proof of the fact is perfectly satisfactory - The stones were on a minute examination found to be composed of blackish crystals of different kinds with metallic or pyritic spots, all united together by a kind of consolidated ashes; and on being polished, they exhibited a ground of dark ash colour interspersed with blackish cubical crystals and shining specks. Hence the author concludes that the stones were generated in the air by a combination of mineral substances, which had risen as exhalations from the earth; but not as he seems to suppose from Vesuvius.

The author however is of opinion that on numerous stones of ashes mixed with Pyritic dust, and with numerous particles of iron, having being projected from Vesuvius to a great way off, became afterwards condensed in the descent - look for

both of it self, as well as by means of the Electric fluid which it contained - produced many capacious - melted the pyrites and metallic and crystallaceous particles of which the ashes were composed - and by this means had a sudden crystallization and consolidation of those particles taken place, which formed the stone of various sizes which fell to the ground; but did not render the clayey ashes so rapid by as the metallic particles crystallized, and therefore gave an opportunity for imperfections to be made on the surfaces of some of the stones as they fell, by means of other imperfections on them.

Plin's remarks on Showers of Stones
4^{to} 26 Vest. 1796

335 The acting of plays when Enclitic or Latin
 in public schools seems improper. It
 destroys that modesty, that amiable de-
 fidence in youth, which has many other
 causes concur to destroy - Let not a young
 man be taught to over act his part, or to
 express feelings which youth and imma-
 turity do not possess - In short ~~the~~
 his mode of performance will be imitation
 and mimicry, not such as comes from the
 heart

336 The noxious air in the Grotto Del Lano
 seems to consist of Carbonic Acid, ozob and
 and perhaps some oxygen. It is warmer
 than the air above, Gun powder may be
 fired in it, and phosphorus will burn in it
 Sp. Travels -

337 M. Dodd's estimate of the Expense
 of the Tunnel below the Frames from
 Tully to Gravesend

To 900 yd running measure of Tunnel including the Excavation and Balling with Ties stones at 12 £ p yard -	£ 10,000
To relaying the bottom with new made ground, 900 running yd at 1 £ p yard -	900
To strong lamps and Lamp rooms through the Tunnel Toll Collectors rooms, gates &c at each end -	400
To making good entrance roads at each end of the Tunnel -	160
To a Steam Engine & pipes &c, off found necessary, to draw off the drainage water -	1,700
To necessary machinery during the excavation -	500
To 10 p Cent on the whole for Contingency	1,450
	£ 15,995

338. In the Cotton mills one person does the work of eighty in the old mode of spinning —

339. Mr. Dodd proposes to make a central arch of London bridge ^{full} 300 span and 100 feet above high water mark built of iron. This would allow the largest ships in the river to pass into the space between London and Blackfriars bridge which when accommodated with Quays and Wharfs would contain many more shops than the docks proposed, and be executed in less time and at less expense. —

340. The author of "Thoughts on a new currency," by a Banker - Disapproves the idea of debasement of the coin, and thinks that any alteration ^{in value} would be attended with the most serious consequences. — The reversion of the Standard in Ed: 6th reign occasioned an unusual and uncertain value to be assigned to all the necessaries of life —

The quantity of silver in circulation. The ^{estimate} Hales at about 4 millions, in crowns, half crowns, shillings and pence — worth at an average

Crowns -	4, 8
Half C.	2 2
Shill -	0 1/2
Pence -	2 1/2

Now if the silver coin be called in to keep up the public faith a new coinage of full value must be issued this will cost £250,000 or 1 1/2 millions — It would be inconvenient for Gov: to open this sum at present (1790) and let it fall on the publick would be great injustice, particularly as silver coin is mostly in the possession of the middling and lower classes.

— ^{what} given is the amt: of the Gold in circulation

341. Zippoos war rockets consisted of an iron tube of about a foot in length and one inch in diam. fixed to a bamboo rod of ten or twelve feet in length. It is fired from the hand and flies to the distance of upwards of a thousand yards. Some rockets have a chamber and burst like a shell; others called ground rockets have a serpentine motion, and on striking the ground rise and bound several times till the composition be spent. The rockets make a great noise, and excite by annoying the native cavalry which generally move in great deep bodies; but are rarely availed in seldom take much effect among our troops —

Learn what is the composition with which ^{the} rockets are charged?

342 The followers of an Indian army on a moderate estimate be reckoned at four times the number of fighting men.

343. The light & the much used in sieges by the natives of India are of no use to discover the position of the enemy if at any considerable distance. Indeed they ~~are~~ ^{were} of more use to the assailants than to the defenders at the siege of Seringapatam in 1792. — The Garrison could not discover our people at work within 100 yards of their walls.

344 Mercury for an artificial horizon, ^{may} be rendered clean enough, by passing it once or twice thro' a paper flannel with a small tube —

345. The following extract of a letter from
the Army in Bedrood Dala Camp 17th Sep
(1799) "We are all very much fatigued after
"crossing the Tonge and Boodra rivers
"in European felt in who was saved by
"an Elephant sent after him for that pur-
"pose. Before the creature reached him, he
"went down, as we thought for the last time,
"but fortunately rose again, when the Ele-
"phant made a grasp at him and pushed
"him, the noble animal then followed him
"down, and made another effort which was
"successful. The poor man was motionless
"when the Elephant formed his trunk like
"a hook, and raised him to his keeper.
"The man perfectly recovered in a few hours

346. Scipio's tomb, which is said still to exist
in the vicinity of Naples, has this inscrip-
tion
"Ingrata patria! neque opera mea habebis"

347. Several of the Bengallee numbers have a
great resemblance to the European - Dos, two
Teen, three, Chauri, Quatur, four - Saumh;
Aunke - Saute, Septem - Aurt, eight, as the
Scots pronounce it aught - Noie, Novem,
Dos, Duem, Noy, 20, hence perhaps our
word score - Ahk Noy, a score

348. Words in Bengallee similar in sound to
English words of a different sign.
Adamee, a man - Kender a woman

349. The King and queen of Otaheite are always carried about on mens shoulders for where ever they set foot on ground the place is sacred and not that their own domestics can walk on it — If an umbrella is expanded over their heads, it becomes sacred to their own use

350. Whatever an Otaheitan asks ^{in private} includes the utmost bounds of their expectations, so that to add more is superfluous and unnecessary

351. To appear an angry god, a human sacrifice is often offered at Otaheite — Sam in Bengat — See Spiker's remarks Oct. 3th —

352. The Dignity of the Otaheitan King will not permit him to help himself at meals — after he has requested that the same might be kept for his sole use, and that no woman or might be permitted to touch it

353. The mode of carrying the King and Queen is with their legs hanging down before them

on the shoulders leaning on the heads of their carriers, and frequently answering them — return with greeting and the women who attend them abound. It is the singular privilege of the Queen that of all women she alone may eat them. Whose privilege she seldom fails to make use of

354. In Otaheite poverty never makes a man contemptible; but to be effeminate and covetous is the greatest shame and reproach. —

— Disputes are all settled by Arbitration —

355. Women in Otaheite have no appropriate place of worship; nor are they ever present at their domesticities; nevertheless they or they shall be admitted to happiness with the Eatooas as well as the men —

356. In Otaheite tattooing is universal with both sexes — Distances are computed by the time employed in travelling — Day and night as in China, are divided into 12 hours or equal parts, and the time measured with Colubine

accuracy by the Sun and Stars.

- Sit usually on the ground cross legged
on a mat. - Sleep either on the same
or low bedstead. - Follow a wooden stool
nearly wrought out of one block.

- Excellent judges of the weather from the
appearance of the sky and weather. - Have
names for many of the fixed stars and can
predict their time of rising and setting with
so considerable precision, and what is more
singular many of their names and the ac-
count of them resemble the Greek fables
They have their heirs, or two children,
their castles and towers.

- Year consists of 13 months, being run as
they calculate by lunations, and the time
when the sun is vertical.

- Well acquainted with conversing by
signs and perfect masters of the language
of the eyes.

- Language smooth and soft, in some in-

stances ~~of~~ very capricious &c. The persons
we differ according to the number of persons the
house of

- Have no partitions in their houses.

- Religion is a good and Evil spirit. In
a future state of happiness is granted but
not of misery. - Most devout in public

- The high priest Manne, Manne. Did not
relish Capt. Wilson's discourse of on the pro-
pity of having but one wife. His five
wives, however who were present said it
was my Ty, my Ty very good

- Spear or javelin from 8 to 14 feet long
- point it on the fore finger of the left hand.
- mark at 30 or 40 yards distance

- Bows of Arrow wood, arrows of small bamboo
pointed with Ias wood (very hard, substance of it)
Bow strings of the bark of the Pease - never used
in war - Parties shoot against each other,
quietly distance, not at a mark.

Of the

— They both for amusement and used in
war - of Coir fibres - Held round the shoulder
down kept fast the left thumb - gave a jump
whistling three times round, the left hand
grasping the right wrist - great force -

N. N. It is curious that the Roman practice
the string was held three times round
There however were esteemed the best stringers
who discharged the stone at the first round.

357 The deep drains on each side of the street in
Calcutta are a great nuisance. Instead of carrying
off the water as is supposed, the water stagnates
in them for a long time after the rain has
ceased - Would it not be better to make the
streets all covered with a very shallow gutter
on each side?

358 There is a Portuguese Schoolmaster in the
neighbourhood of St. Ursula. After dinner
that is about 4 or 5 o'clock he has always
a card party in the school room while the
boys are getting their lessons!!

359 The continuance of Scipio in restoring the
young wife to her husband has been
praised as the first trait in his Character
Is there any Officer in the British Army
who would have done otherwise?
— Scipio's Character was above being hurt
by an act which any man might have done.

360. The best English Alum contains
Glauber's salt and vitriolated Tartar.
This may be discovered by calcining
the Alum with Charcoal powder which
decomposes the alum only, leaving the
other two salts unaltered with the
Alum earth, & hence they may be ex-
tracted by water — Prop. of Arts —

361 With steam of noxious air by a
long metal or wood tube with a fire
place of stone at top —

362 Archimedes's demonstration of the fun-
damental property of the lever, would be very
satisfactory and elegant, provided the
principle on which it is founded could be
clearly proved, viz "that two equal powers
at the extremities of a lever in their sum
at the middle of a lever, would have equal
effects to move it about any point."
In a progressive motion this is sufficiently
clear; but not so in a rotatory motion —

The principle may be thus proved
Let AC be two equal bodies placed in a
straight lever AP movable about P ; bisect
 AC in B , produce PA to Q and let BQ
 $= BP$, and suppose the end Q to be sus-
tained by a prop. Then as A and C are simi-
larly situated in respect to each end of the
lever; that is $AP = CQ$, and $AQ = CP$ the
prop and fulcrum must bear equal parts
of the whole weight; and therefore the prop
at Q will be supported with a weight equal
to QA . Now take away the weights A & C
and put a weight equal to their sum at B ;
then the weight at B being equally distant
from Q and P , the prop and fulcrum must
sustain equal parts of the whole weight, and
therefore the prop will now also sustain a
weight equal to A . Hence if the prop Q be
taken away, the moving force to turn the
lever about P in both cases, must evidently
be the same; therefore the effect of A and C
upon the lever, to turn it about any point,

363. There are two low points, one between the Earth and Moon, the other on the side of the moon opposite to the Earth, at which, the attraction of the Earth and Moon is equal.

Let the Dist: of the moon from the Earth be d the quantity of matter in the Earth e in the moon m - call the Dist: of the point from the center of the earth x - the distance from the moon will be $d-x$ - But G^2 is as the matter directly and square of the Dist. inversely - therefore the Earth's attraction is as $\frac{e}{x^2}$ and the moon's is as $\frac{m}{(d-x)^2}$. But these are equal to each other therefore

$$\frac{e}{x^2} = \frac{m}{(d-x)^2} \text{ and } \frac{\sqrt{e}}{x} = \frac{\sqrt{m}}{d-x} \text{ therefore}$$

$$x = \frac{d\sqrt{e}}{\sqrt{e} + \sqrt{m}} \text{ or multiply both num. \& den. by } \sqrt{e} + \sqrt{m} \quad x = \frac{de - d\sqrt{em}}{e - m}$$

round numbers let $d = 60$ cent: Earth $e = 40$, $m = 1$, then $x = 52$ nearly. To find the other point, put $x-d$ for the square ~~the square~~ which in this case would be a positive quantity then $x = \frac{de - d\sqrt{em}}{e - m} = \frac{de + d\sqrt{em}}{e - m} = 72$ cent: nearly

Quantities - If the Equation had been multiplied before extracting the roots the adjusted equation would have given the same two roots - Fi's Algebra -

364 The best mortar for brick work in Bengal is $\frac{1}{2}$ lime $\frac{1}{2}$ sand and $\frac{1}{3}$ Sulphur. Sulphur is old bricks pounded - Both Stone and Shell lime are used, the first is by much the best.

- Saut timber is commonly used for beams and joists. It is very strong, but heavy.

- A species of dirt among the natives here is to gather the refuse of pieces of brick at the kiln, before they are burnt, and use them as Sulphur. The mortar made with this, never binds but crumbles to pieces -

- Query what reason is given for using flat roofs in India and Pitch roofs in Europe?

365 As Sulphate of Soda loses near half its weight by efflorescence this circumstance should be attended to in prescribing Dose of this Salt. Rather more than one third left in a state of efflorescence should be given than in few transparent Crystals -

366 Nitrate of Soda (cubic nitre) Dissolve in two
C parts of cold water to 1 of the salt, and in
nearly the same proportion of in boiling water

367 The best process for Crystals, only sets which
C Dissolve either in hot and cold water, is to ex-
pose that solution in a dry place to the slow
evaporation of the atmosphere. In this way
the Crystals are larger and more perfect.

Ex: nitrate of Soda

This salt is not found in Nature, is a product
of art, and has hitherto been applied to no useful
purpose.

368 A republican Lamp was found in the grave
of a Roman in the Island of Nisida near Naples
which is said to have burnt with a clear light
in a glass sheet horn, securely sealed; and was
extinguished the moment the glass was broken!!

369 When Augustus conceived a better judgment to
concern the thought of restoring the ancient freedom
of the Republic, Agrippa advised him to pursue his
plan; Messius advised the contrary, Messius was
right. Political Chimeras are innumerable; but the

most chimerical of all is the project of imagining
that a people deeply sunk in degeneracy, are ca-
pable of recovering ^{the} ancient grandeur of freedom
who before the bird into the air after his wings
are clipped. To far from restoring it to the power
of flight it will but disable it the more.

370. Pettae are said, from the Latin name (nota) to
have been invented at ~~the~~ Nola in Italy, in
the fifth Century - Pettae are much older men-
tioned by the ancient Greek and Roman writers.
Eschylus - Aristophanes &c. -

371. The boatmen in the neighbourhood of Capra
by whistling collect a great number of Dolphins
round the boat - so that the story of their being
some foundation -

372. The Lark tree is the only one which lives
after shepherds off its back - The bark is from 3 to
4 inches thick -

373. A state is free or Slavish according as ^{much} good
law governs or are neglected -

374. In P. Buddon's report, respecting the use of nitric acid in the cure of the venereal disease, the quantity of nitric or nitrous acid was from 1 to 3 Drams in a quart of water, sometimes with the addition some times of water of sweet, but often with common Symplic from 6 to 8 ounces to the quart of the compound. This mixture did not fast once in 3 or 4 times - its general effect was to increase Appetite, revive the spirits, and improve the constitution - To prevent the acid from acting on the Teeth it was drunk through a tube -

375. It is remarkable that the word innovation which simply signifies change by the introduction of something new, should almost universally be understood in a bad sense. An innovation may surely be an improvement as well as a corruption - Every discovery is an innovation -

376. The strongest spirit ever produced in England was rectified by Mr. Lewis Dabbin Holburn - Specific Gravity at 55° Fahrenheit was 0.092
J. G. Faraday produced spirit of 0.13 at the Temp. 60°, that is, 0.102 at 55° - Alcohol at Apothecaries Hall is 0.20 at 55°

377. Menaces assured us that all laws ^{anciently} both Divine and human, exhorting to virtuous illustrious actions, were written in verse and publicly sung by a Chorus to the sound of instruments, this was found the most effectual means to impress Morality and Religion on the minds of men -

378. The Nitrates of Silver, Mercury and Potash are all equally clear - Green the best mode of distinguishing them -

379. Nitrous gas from iron is very variable and therefore uncertain in Eudiometric experiments - Alkali's Sulphures are much preferable as tests for determining the quantity of air -

380. All the oxides of copper that are formed or dried in the air, precipitate, besides the blue, a green oxide -

301

To analyze gun powder -
 Boil the powder in distilled water
 On evaporating, the filtered liquor, the
 residue is obtained by crystallization
 Then remains on the filter the Sulphur
 and the Charcoal. These may be sepa-
 rated either by subliming the Sulphur
 in close vessels; or by exposing the mass
 to a degree of fire capable of burning
 the Sulphur without kindling the Char-
 coal which is easily done under a
 muffle -

N.B. In separating the Sulphur and Char-
 by subliming part of the Sulphur adheres to
 the Charcoal, Mr. Macassar thinks about
 $\frac{1}{24}$ part of the whole -

302

As the Azale and Coralline some
 times approach near to each other in
 colour &c. They may be easily distinguished
 by their fracture, that of the Azale being rough
 & the Coralline smooth and shining
 M. J. - a Tubby

303

The velocity of a body may increase
 to such a degree that friction will nearly
 be diminished - Every immense mass will
 find to fall into every cavity immediately
 before it -

304

Attrition is hurtful in many cases
 than are some in which it is useful -
 - In the action of files, - $f = \frac{1}{2} \frac{v^2}{r}$ -

305

Friction is diminished by daubing the
 surfaces with some greasy matter, to fill
 the cavities, or act as small rollers -

306

A Gun discharged on the water or from
 one side of the river to the other is said
 not to carry a bullet so far as one would
 estimate arising from a wrong estimate of the
 Distance -

387. Dr. Carter Esda and some other
Microscopists supposed the universe a
Plenum, and constituted a plenum by
an elastic fluid. But Electricity is incom-
patible with a plenum.

388. It is alledged by some that a lecturer on
Chemistry should be a prudent man.
If this be true, ~~with the~~ for the same reason
he should be a Dyer, Bleacher, Brewer,
Distiller, Potter, Glass maker, and fifty
other arts and manufactures.

The medical virtues of certain bodies are
belong to the Physician, not to the Chemist.
Every Physician should be a Chemist
but a Chemist need not be a Physician.
Chemistry cannot account for one medicinal
property of a body. — Exemplified by
Sugar of Lead and common Sugar —
— Struggling at reasoning has hitherto been of
little use in the medical science.

389. Pharmacy is the art of collecting, pre-
serving and preparing for the use of the Phy-
sician the various substances employed to act
on the human body with a view to the
production of health and establishment
of health — Dr. Black —

390. Dr. Black's course of Chemistry consisted of
110 Lectures, of which only the last and
part of the preceding are dedicated to Phar-
macy — and this merely as an example of
the application of Chemistry —

391. In freezing mixtures does the composition
itself ever freeze? — No.

392. In Cap. Rands patent telescope
the divisions on the Micrometer scale
must be double, because as both systems
of wires move, the scale moves thro' but
keeps the space — When double, the
scale gives minutes of a Degree

393 A whistling - howling wind is u-
niversally considered as a sign of rain.

The sign is common to all climates
and all ages - This is the sound at-
tributed to most probably in same temp-
ture "And Elijah said unto them get
the cup for there is the sound of abun-
dance of rain" 1st Kings: 18:-
- Given the cause of this whistling?

Is it owing to an increased quantity of
moisture in the air? Is this moisture
in a combined or free state? -

394 The Dominion of the priesthood over the
Laird is in proportion to the absurdity
of the doctrines, and multiplicity of cere-
monies of any particular religion. -

395 A calf is more effectually nourished
by diluting its milk with an equal
M quantity of water, than by the milk alone
- D. Cullen -

396. From Chemical investigation much
Knowledge with regard the medical virtues
of Radix has been expected; but it is now
known that little can be obtained
- D. Cullen -

397. The effect of warm water on the stomach
M is a difficult problem. - D. C. -

398 A weakly Child totters as it walks;
M but by giving it a weight to carry on
by thus increasing the tension of the ligaments
it walks more steadily - D. C. -

399. In Britain the latest fruit of the sea-
son is always the earliest. -
In cold climates a longer time is requi-
site to elaborate the juices, than in
warm climates - D. C.

36
400. It is generally supposed that the
short sighted become less so as they
advance in years. Mr. Wynn always
found the reverse to be true. That deeper
concerns become necessary as the person
advanced in age

401. A person who has been corrected for the
cataract, requires two pair of spectacles
one for distant, the other for near objects
- x This proves that the power of adjusting
the eye to different distances, resides in the
the Crystalline lens. Focus from $1\frac{1}{2}$ to 6

402. A Galilean telescope does not ad-
mit of a Micrometer or cross wire
because the wires cannot be so placed
to be seen distinctly with the object.

403. When the number of real images is
even, the object appears upright; when
odd, inverted —

404. Pythagoras is said by several ancient
authors to have sacrificed a hundred oxen to
Apollo on discovering the Theorem which goes
under his name. This seems inconsistent with
the doctrine of Pythagoras, the Metempsychosis

405. G.M. in the end of a Syllable in English
sounds like N. with ^{the} preceding vowel
long, E.g. Reign, resign — G.M. should
perhaps be pronounced in like manner
offense? — Mr. Crawford pronounced the
word so, but Miss Young sounded the
G — I am sure you know the nasal sound
of such Syllables? — Condemn, Malign &c

406. Is not a. but some beam with springs at
each end the best; for the beam
can be accurately adjusted ^{and easily} immediately
before the experiment? —

407. The sum of the lines forming the angle
of incidence and reflection is less than
the sum of any other two lines drawn
from the same points that is
 $AB + BC$ less than $AD + DC$
The course of the rays should be
the shortest possible. Nature simple &c —



36
400. Of the five regular Solids, a combination
of Cubes only can fill a Solid Space -
Menton in his Opt. 1st Part. says all con-
trary is a mistake

409. As a white heat is required for the di-
- Distillation of Phosphorus, why does not the
- Vapour in its passage into the receiver
take fire? - It has not atmospheric air -

410. If two bullets one of Cork the other
of Lead be discharged in Vacuum the for-
mer will go farther than the latter. -

411. Last night (12 Feb^r 1801) Calcutta -
I was much entertained and somewhat
alarmed with the following phenomena
of Vision. I lay awake till, I think after
12 when some luminous spots appeared
on the bed curtain I first thought it must
have been a fire fly moving about in
the room, but soon found that it was not
the eye itself. The following are the
principal circumstances attending the

various phenomena -
- Stars appeared towards the sides of the
eye, and when the eye was moved the stars
 fled from the axis. - When a star approached
the extremity of the eye it parted in a large
part of light, like the tangent lightening
sometimes observed near the horizon. These
spots took place when ever the eye was
suddenly moved. They sometimes spread
and divided like branched lightning or
like the strong Electric sparks. Some times
a kind of faint white light with stars
resembled the heavens. The bed appeared
distinctly and when I held out my hand
I could discern its white colour, and distinguish
each finger, tho' there was no moon and the
room was shut perfectly close. I tried a new
English blanket whether Electricity had
any share, but found not the least appearance
- The Phenomena was nearly the same
whether the eye was open or shut. On
looking towards a window I could not ap-
- perceive a star or any the least appearance
of light. I now began to be alarmed for my

36
eye sight. Occupied fully with this
subject I fell a sleep, and Dreams on the
hour consequent succeeded my waking thought
I was happily revived by the morning
sun, when looking out of the window
I found my sight as usual. —

412. Oak Casks render the country room better
like Oak, if the casks be new — A few
casks of this room wood rendered the room as
much like birch that the owner of the
was obliged to enter it at the Custom house
in London and to pay the Duty for Amack
which is much higher than for rum. —

413. The magnifying power of a Solar Micro
is as the Distance of the screen to the fo-
cus of the magnifier

414. In the compound reflecting Microscope the high
Magnifier does not much exceed that of
lenses. For altho' the power of the
object lens is greatly increased by two eye
glasses, yet the former must be a much
less magnifier than in a single Microscope

415. Would it answer the purpose to extract
the Gallic Acid from the numerous woods
of this country which contain it for Tanning?

416. Gypsum when applied as a manure
and sown at the rate of about six
bushels per acre, produces excellent effects —

417. Two pieces of an iron rod are to
be screwed, given what proportion should
the interior screw have to the exterior? —

418. In a long continuance of hot weather the
Burning Glass does not act so powerfully as
on the Sun's shining immediately after a shower
given the cause

419. Spirit of wine cannot be inflamed by the most
powerful burning Glass — given the cause —

420. Wednesday 6th March 1799. The French caught
two large Sharks, when got on board and
opened, six young ones were taken out of one,
two feet long, they were not only alive but ex-
hibited the greatest vivacity, and in a tub of
water swam with as much liveliness as

if they had been in the sea.

Gregory's Journal of the ^{Ruff-}
second W. Voyage

quere from what part of the Sherk
were the young ones taken? —

421. The Mercury been and con volutions with
some other plants follow the Sun from east
to west; whilst hops, honey suckles and
many others move in the contrary Direction

422. Receipt for curing butter —

Take fine salt 2 parts, Salt peter 1
and Sugar 1 mix them well together by
blending the whole completely. Take one ounce
of this composition to a ^{lb} of butter work it
well into the mass and store it up for use
It ought to stand three weeks or a month
before it is begun to be used —

Dr. A. N. view of the world:

423. Cure for the Dysentery by Dr. Paken

M Take any quantity of the best Vinegar with
Lemon or orange Salt. To one large table
Spoonfull of this solution add four times the quant.
of boiling water. Let the patient take of this

preparation, as hot as it can be swallowed,
one Spoonfull every half minute till the
whole be drunk: this is for an adult. If ne-
cessary repeat the dose once in six or eight
cooling simple drinks, such as plantain
tea Sage &c. may be used.

424. There is no row in the Swedish Lan-
guage for Adultery!! —

425 That Gravity decreases in the ^{upper}
proportion of the square of the distance
is proved from Gravity acting in
straight lines, and from the motion
of the moon — That Gravity acts in
straight lines is proved from the pen-
pendicular descent of bodies to the surface
the descent arising from the sphericity of
figure of the earth makes little varia-
tion for the law. —

30
426 Professor Jacquin of Vienna has lately
(1800) made some experiments on the gas
in which of second. A small tube about
six inches in length was fixed into the
neck of a receiver on the shell of the
Omnium-thermo apparatus. A bladder
full of any air was adapted to the mouth
of the tube and the gas in receiver was filled
with the same air

- results

The intensity did not vary, but the pitch
when compared with Atmospheric air was
as follows

Oxygen gas half a note lower
Ozone - half a note lower
Hydrogen - nine or ten times higher
Oxygen and ozone in proportion of
At. air gave the same tone as A. A.

When the two gases were not in proportion
or properly mixed, the sound was very harsh
Sup: to Eng: 13° -

427. Dr. Chladni of Wittenberg has lately
invented a new musical instrument
composed of glass tubes about the size
of a quill and 16 inches long (42 in.)
This instrument is played on by rubbing
the tubes horizontally by the wet
finger. - Sup: E. 13°

428. Chimneys were unknown to the ancient
Greeks and Romans - between them not
say a word on their construction. In Persia
near the rocks were found in some private
houses, yet neither chimney nor stove has
been found -

429. To three parts of gutta serena, newly made, add
two parts of a saturated solution of fixed
alkali on water, the compound is a liquid
somewhat milky, which kills earthworms
caterpillars and other vermin when on the
insects they touch it, without injuring in
the least the most tender vegetables. Sup: 13°

430 One ounce of Gum Arabic renders a pint of water considerably glutinous: four ounces gives it a thick syrupy consistence; but for sweetening one part Gum to two parts water is required; and for some purposes an equal proportion will be necessary.

431 Not water is best for Stealing Limes than cold, the absorption impeded by the heat of the water added to that of the limes.

432. A metal by being forged or drawn frequently through a hole in a steel plate has its cohesion greatly increased. This may depend to be accounted for. The general density in all of the metals is increased except lead which is rather rare by being wire-drawn; but its cohesion may be more than tripled by the operation. Gold silver and brass have their cohesion nearly tripled; copper and iron have it more than doubled.

X Iron says the density is increased with wire

433. A piece of iron in a solution of tartaric acid is almost instantly converted into copper. Gum why does the process continue till the whole iron is somewhat wholly dissolved? Should not the first incrustation prevent the further action of the acid on the iron and consequently any further precipitation of the copper?

434. The Schedule to the act of Parliament in the year 1751 or 24th of George the 2^d contains the Calendar of the Church of England then introduced on account of the alteration of the Style. In the table for finding Easter day - "For the next century, that is from the year 1000 till the year 1099 inclusive, add to the current year

435 To measure the diam^r of wire. could be wrapped the wire several times round a cylinder to measure the whole, which divide by the number of coils -

436. After pouring Sulphuric acid through a glass funnel which was perfectly dry the tube of the funnel in a minute or two became so hot that I could scarcely bear to touch it. This is a proof of the great violence of the latent air at this season (rains) 15 July 1805.

437. Water enlarges its bulk about $\frac{1}{67}$ from 60° to 100° of Fahrenheit's Therm.

438. Specific Gravity ^{of fluids} may be ascertained by weighing them in the same bottle which should contain at least a pint, and should have a long stem, the bore of which should not exceed a quarter of an inch.

439. Olive oil has been found to be a cure for the Plague at Smyrna. It is rubbed into the body all over - About one pint each time.

440. A very limited room can contain 12 cubic feet of air and a ~~very~~ fifth. The friction of the Glottis between these extremities does not amount to $\frac{1}{12}$ of an inch. The must therefore be divided by the most ordinary singer into more than a thousand parts, and this must be done in an instant and repeated with rapidity, without ever mistaking one of those Divisions. The mechanism for effecting this is very remarkable and seems to prove that the Nature of our being means to give us this pleasure.

441. The Forte Piano was invented by Mr. William Mason an English man.

442. A brass wire has a considerably lower tone than a steel wire of the same Diameter and tension - Guess how much, and the cause. - Steel lighter and more Elastic than brass.

443. The Celestine^{us} Described by Marsennus
by the name of Achivota. A fine kind
of horse hair or silk is extended below
the strings and drawn smoothly along
by a wheel. By a particular mechanism
of the Keys this band is made to pass
or cut on any string transversely as
the strings of a lute are touched by
a bow. —

444. There is no sensible difference between the
ancestral and Roman owner and our
Aquadupine owner — W. Cotes —

445. In 1705 the Variation of the Compass
on the Plains of Abraham was $12^{\circ} 35'$
In 1793, $12^{\circ} 5'$

446. W. Canton thinks the Diurnal vari-
ation of the Magnet to arise from heat.
— Heat diminishes magnetism

447. The concrete acid of Lemons (Citric acid)
is not so powerful an antiseptic as
the juice it self. — Exper. Shipp to China

448. It is said that the best soil is that
which distinguishes most inflamm.^{us} air —

449. Le Cat's experiment of the pin head being
inserted when held between the eye and
a small hole in a black card is said
to have puzzled the late Mr. Ferguson to
account for it — Why? —

450. The night tides in the Goochly and Farnes
are always higher than the Day tides.
This is known to every Bengellu — Where
the cause, and what the usual difference?

451. ^{Dr. Franklin} first observed that the non-
conductors of Electricity are also non-conduc-
tors of Caloric, and c. contr. — Examples metals,
Glass. But to this rule there ^{are} many exceptions

The common Torricellian Vacuum affords a ready passage to the Electric fluid, but Mr. Thompson found that it was less permeable to caloric than Atmospheric air which is a very bad conductor of caloric. Sulphur and oils which are even conductors of Elect. are represented by Humbolt as the best conductors of Caloric.

452. Iron powder from at 600° of Fahrenheit scale

453 Formoz is not correct in saying that all mineral substances are dictated by heat. The minerals which contain a large proportion of Aluminous earth afford a striking exception to the general rule - Wedgwood's Phos. is an exception - See Phil. Trans. 1779 p. 6

454 Light sustains no decrement in passing thro' the flame of several candles according to Count Rumford

The light emitted during combustion is derived principally from the combustible body or from the oxygenous gas, for it seems improper to derive it exclusively from either. When there is reason to believe that it enters into the composition of both, the present state of our knowledge of Chemistry does not enable us to determine.

456 The Caloric of the French Chemists is synonymous with the caloric fluid of Lavoisier, the absolute heat of La Place, and with the matter of heat of Laplace. These terms express a particular kind of matter, or a particular quality of matter which exists under a variety of modifications that are mutually convertible. One of these modifications is free Caloric. It is in this state that caloric affects movements with heat the sensation of heat, and that it expands in every direction thro' bodies.

into which it ~~enters~~ enters. Free
calore was formerly called sensible heat,
and is synonymous with the expressions
of intense calore, uncombined calore,
thru unmixed fire, and calore of lump powder

Thompson notes in Fourcroy.

457. To purify Zinc, melt it with Sulphur and
any fat substance to prevent its oxidation -

458. Corrosive Sub: is the best test for discovering
whether a fluid contains Vol: alkali - a
precipitate. -

459. By a late census (1801) of the united States
of America, it appears that their population
is 6 million, their Merchant Shipping at
least 10,000 the value of their yearly exports
above 70 Million of Dollars, and their public
revenue 15,000,000 of Dollars
Calculus Test -

460. This day, 21st Dec: 1801) after looking at the
Sun thro' a pair of Spectacles of coloured glass

I wrote a few words in my Diary, the letter
became gradually of a very bright red co-
lor, the ink in the pen was extremely bitter
On repeating the experiment, I found the result
the same. The beautiful red was produced only
from a Black Body. - quere the cause? -

461 In the Danish Language it is always sound
like a - Primer Muskenbrock -

462 It is contrary to the Jewish religion to at-
tempt to make Prosylytes -

463. Phosphorus is ^{not} considered as a useful reme-
dy in cases of Debility, narrow Stomach, Catarrh

M epistaxis, impotentia virilis &c - in
one occasion lately in which a person
possessed by aqua tofana was saved by
Phosphorus. Its effects are at the same
time in a considerable degree decretis
and diaphoretic - Phosphorus is obtained
by mixing it with osunives with oil, both
improper the last is however disagreeable to the

4.

Tests. A solution in Ether, has its heating and irritating qualities are greatly increased and as only 10 grains of Phosphorus are soluble in one ounce of the Ether, 120 drops must be taken to bring one grain into the body, which in most cases would be too dangerous. However this Naphtha Phosphorata may be of great benefit in use in a very high degree of nervous debility, combined with a total want of sensation.

M. & P. Jour. vol 4

464.

M

To exhibit Phosphorus. Rub 2 grains with sweet Almonds in a sufficient quantity of Gum Ar. to make an emulsion and by an addition of Spirit. ret. Dul. or Symp. Sarsaparilla, the taste and smell of the Phosphorus is rendered less disagreeable. Madam Leprieu may 30 drop to two grains of Phosphorus - A table spoon full every two hours. - 6 ounces of water used.

465.

M

Sores of the worst kind cured by the Symplic. Symp. of Nutmegs, Pepp and other aromatics

M. & P. Jour
vol 4

466

M. Humboldt In three comets for measuring the quantity of Carbonic acid in the air
see M. and P. Jour. vol 4

467

In Cook Baker the following custom prevails. If a Rhyot or peasant owes a sum of money which he is unable to pay, he is compelled to give up his wife as a pledge, and possession of her is kept until the Debt be discharged, sometimes for the space of two or three years. Should there be any children during her residence with the creditor, half goes to him, and the other half to her husband. *Swiss Embassy*

468

Even one of the Protons in our atmosphere is not so much as a Whimper for they seriously believe that loud speaking gives such a concussion to the air that a delay of rain is sure to be the consequence

469 In Bostan and Tibet the cups bear
always under the fingers before his mouth
press a little into the hollow of the hand.
This practice to prevent spitting.

470 The Bostan bow is six feet long, straight
when unstrung, made of a bamboo similar to
the mountains of that country. Bow string is
small cord of hemp - Arrows of a Discus
bamboo, headed with barbed iron - Bow held in
the right hand, bent by the thumb of the left
armed with a ring or piece of leather, the fore
finger on the thumb nail. -

471 The piece used for arrows is of a very soft
unsalted jess, but this it inflames the wound
it is seldom fatal. -

472 The Bostan Arrow is a basket with
a hole in the side. This this piece is
bamboo, which round by two persons who
take hold of each end of a string - The
upper end of the shaft being fluted is inserted
into a hole in a bit of wood which is occa-
sionally tied to a tree etc. The lower is split
into four pieces, which are kept asunder
by a cross piece etc. -

473 In Bostan (Dead bodies are exposed to the
open air like the Persians to be devoured
by ravens Kites and vultures (Dogs. -
Tibet)

474 In Bostan raw mutton is preferred to
cooked meat -

475 The Bramin can sound their Chamma
(Shells) for a quarter of an hour without
intermission - Same as the of Glass pipes

4. 476 The Germans celebrated the last day of the year by a peculiar custom, that of the men throwing water on the women and the women on the men to wash away the stain of last year.

477 German houses of wood and straw are constructed in the same manner as the Chinese — Sycamore Embassy

478 Mr. Robinson has repeated Volta's Experiment for the first time at Paris — 100 grains of silver and Zinc contained atmosphere and separate sparks, the divergence of the Electrostatic and electric fluid — He closed the circuit by charging 100 of the Leyden bottles with the metallic plate; discharged the fluid of Volta by the pole and of the Galvanic spark.

Medus Gazette &c
21 March 1802

479 Gilbert Wakefield says Pope did not understand Homer in the original. —

480 Is it possible by means of a small hole in a very large syphon to raise the crown of the instrument to supply a house with water while the syphon continues to discharge the larger quantity in the usual way? — Mr. Hutton finds the experiment to succeed when the hole is very small —

481 Green flax after the seed has been taken from it forms a good starch for a human let it be fastened together with a cord well impregnated with pitch. The thread is in a wet state. In a short time it swells and throws out a glutinous matter which makes the contiguous stalks adhere together and form a solid impervious to the elements, affected by neither sun wind or rain

The shower described in this volume
fully year ago is as dry as when first
put on —

482. The following may be depended on as
a fact, A man who had been condemned
to be hanged and had only three or four
days to live was complaining to a friend
who visited him in prison, of his hard
fate. His friend replied there was nothing in
it at all, and asked him what he would give
him to take his place. The prisoner said
he had only four rups, I will take it
said the other. He accordingly sent on the
drop of the other, shaved his head, got
the irons changed and looked so like
the prisoner, that he passed undetected
till the moment of execution. When the
felon was found concealed in another part of the prison.

483. The custom of crying at parting, between
the parents and the Bride is common all
over India, the same in England Scotland
Ireland and probably all over Europe. —

434 The families of Distinction at Junk Cylon
make a point of keeping their deceased
friends as long as possible from the Pile
so that the body is perfectly purified
and consequently dangerous to come near
it. At the nearest solution must be left
the pit he does by the following con-
trivance

435 The National Debt of Great Britain being
530,365,000 £. If the amount were in silver
and allowing 30 to be wanted in a minute for
ten hours in the day and six days in the week
would require something more than 1917 years:
Weight in Gold = 5760 Tons. In Guineas it would
extend in a right line 8092 miles, would cover

upwards of 63 acres of ground. In the morning
it would extend in a right line 169,932
or surround the earth seven times

Lat: $g: 10^{\circ} N$ $05^{\circ} 1002$

436. The greatest limit of solar eclipses is $17^{\circ} 32'$
least $15^{\circ} 2'$

Greatest duration about $2 \frac{2}{4}$

+ not correct — Lamy's Astr. Vol. 2

437. Just before a north wester begins to blow
hard there is a dead calm. During this interval
the winds vary from Easterly to N westerly.

It is said that during this short calm stagnation
water and every other object emits a strong
odor than at other times. (I shall ascertain this
during next or next season) True

438. Best English Double aquafortis consists
of 9 parts Nitrom acid and 1 part Sulph. acid
Ch. — Single aquafortis of 20 parts Nitrom acid
7 Sulph. acid and 30 water — by weight

439

Nitroarsenic recipe for an excellent ink —
8 oz Galls and 4 oz Log wood in boiled in 12
Pounds of water for an hour, or till one half the
quantity be evaporated. This liquor is poured thro'
a hair sieve, and 4 oz Sulphat of iron 1 oz Sulph:
of Copper 3 oz from Arabia and 1 oz of Sugar
Candy are added. Stirred and let stand for
24 hours. Liquid poured off from its thick
sediment, and preserved in well stopp'd Glass
bottles.

440

New Planet Ceres

30th April 1802 Right Ascension $176^{\circ} 29'$
Declination $17^{\circ} 17' N$

29th June 1802 Right Asc: 102.59
Decl: $0 53 N$

True Calculated by D. Gauss.

17th March was in opposition to the sun and
30th just its perihelion

- Apparent Diameter about $1\frac{1}{2}$
its real Diameter about $\frac{1}{7}$ of that of earth or
 $\frac{1}{2}$ that of the sun

441. On the 20th March 1802 Dr. Olbers of
Bremen discovered a new planet in the
northern wing of Vega like a star of the
7th Magnitude - The color is Yellow
- than distance a little less than that of
Ceres. Eccentricity greater than that of Mercury
Inclination of orbit $-33^{\circ} 39'$
Perihelion $41\frac{1}{2}$ being 2 hours
less than that of Ceres. - It crosses the
orbit of Ceres near the Sun in Perihelion
and farther in Aphelion than that planet
Dr. Herschel has made obs^{ns} on both
he makes the Diameter of Ceres 162 miles
of Pallas 95 Ditto

Monthly Magazine, Mar and Jun 1802

442. In North America and in the northern
parts of Germany, apples are preserved through
the winter by putting them into a room pre-
pared in the upper part of the house for the
purpose with a linnen cloth spread over it. A
woolen cloth it is said will not answer the
same purpose! - given the same -

443. If a rope be ~~inter~~^{woven} among the branches of a
fruit tree in blossom, and one end of it brought
down to water in a bucket, the tree will not
be affected by a slight frost in the night.
A film of ice will be formed on the surface
of the bucket, tho' there will often be no ice in
another bucket which has no ~~ice~~ rope in it.

444. In leveling if double and equidistant stations
are used, there is no necessity of reducing the
apparent level to the true, the visual ray on both
sides being raised equally above the true level.

445 There is a patient brought to Calcutta
from the Cape, which thrives well till
it rains, when the first shower, it is
saw instantly destroys the patient -

446 M. C. still much on the effects of the
first rains of the season, in producing pain
both on Natives and Europeans. It says
that water particularly that of small
rivers produces the same effect - Can bathing
in the lakes after the first rain of the
seasons pain in the Ears, on the face and
almost every part which the water has
touched are the consequence - Can this
qually this the first rains of the season
to produce this effect? or may it not probably
be the consequence of the state of the body
after so long a Drought and heat.

446 An Arithmetical book is not peculiarly
adapted to the introduction of Sentiments of piety,
and of Arguments in favour of religion. Every
thing is beautiful in its reason. The Art prop: of
Euclid, however true and elegant, could not with
propriety be introduced into a charity sermon
M. P. on §. 4 Art.

447 Sir Isaac Newton has never introduced
Fluxions into his principles, nor even
Algebra except in Book 1 prop: 45
I find the motion of the Apides in
orbits approaching nearly to a circle -
- and this only in the Examples

448 and in Prop: 10 B. 2 Given the constant
= square of the velocity and Density of the
medium conjointly, to find the Density of
the medium in each place that will make
the body move in any given ~~right line~~
with the velocity of the body and resistance
of the medium at in each place
Cor? 2 Example 2

440. If a candle be placed at an angle of about 30° it will require no snuffing, and will burn with an uniformly steady light.

449. Bass sleeps in a collection of Niter effectually keeps off the weevils and other destructive insects from Corn —

450. Pieces of old hat immersed for a few minutes in Sulphuric acid becomes excellent protection for the hardest metals

451 It has been lately ascertained that Lavoisier's apparatus was the original invention of Gay Lussac

452. Lavoisier & Berthollet discovered that Ox: M: and gas is well adapted for the recovery of the Drown. (Drowned rats were recovered by this gas in his laboratory. He tried the Experiment on several other animals with success at last on himself! —

News Paper May 1803

453 It is said that violent gales and great hurricanes happen in this country generally at the quarter and not at the full of the moon as commonly supposed in Europe

— In the year 1707. Aug 2. Nov. A Dred full moon destroyed the crop in Birmah and a famine was the consequence. The like happened about 17 or 18 years before, in the month of May — Guess what was the position of the Moon's Nodes ~~at~~ ^{at} ~~the~~ ^{the} ~~time~~ ^{time} ~~of~~ ^{of} ~~the~~ ^{the} ~~year~~ ^{year} 1805? —

— To the above may be added that there was a Hurricane in 1769 and a famine in 1770, which corresponds nearly to the first mentioned interval. —

454. Is the long line of a sharp heavier of water, as is affirmed by many sea-faring gentlemen? If so how is the fact, if it be a fact, to be explained, that at a certain depth the ~~water~~ ^{water} will sink no farther, - all vegetable substances when completely soaked in water are heavier than water. - a wet shirt instantly sinks

455. A few specims and shreds of different kinds just cleaned, were placed with their handles on the floor and their points rest against the wall of the room in a ~~sharp~~ ^{slight} sloping position about a month ago. The sides of the blades which are next the wall remain perfectly clear while the others are covered with rust. As the air had equal access to both groups the cause was the white washed lime wall any effect on the moisture of the air near it.

456. This morning I found a square phial lying flat on the table of my laboratory with two small sticks of Phosphorus half covered with water. The water was ^{and} ~~was~~ oily - The phial having remained in that position for a long time, the upper part of the Phosphorus ^{had} ~~was~~ but whence the oily consistence of the water?

457. What drawback is there on glass imported into India from Britain? - Different wines &c -

458. A transmission on the East coast of America happens more at a place to the southward by about one hour for every 100 miles -

459. If a piece of charcoal be struck by a flint on any other body it will produce sparks. Hence the danger of employing charcoal in striking in making of Powder

~~460. In the ^{glass} experiment with the glass tube and feather when the tube is moved against the feather the latter turns round in the direction of the~~

460. The pigeons of this country (India) are fond of rock salt, which they are said to eat in considerable quantities —

461. When a watch is winding up, it requires a greater force near the end than at the beginning — Does the cause, and does she go faster immediately after ^{being} wound up? — Probably owing to the inner spirals of the main spring rubbing on each other — In adjusting the fusee to the spring, the look allows for this.

462. The Malabar Music resembles very much the Scots. — The smoking pipes used by the Malabars ^{in Opium} are brought from the Moluccas, mostly from Banda —

463. The short tubes of unannealed flint called by the English people, which break by the smallest bit of flint dropped into them, break with much difficulty in this country (India). I am told this is because the tubes become partly annealed by the heat of the climate. All edge tools, as is well known, become so soft in this country. —

464. To give Malt spirits the flavour of brandy — To one quart of Malt spirits put $3\frac{1}{2}$ ounces of finely powdered charcoal and $4\frac{1}{2}$ ounces of ground rice — 15 Days frequently stirred or shaken — Liquor much improved —

465. Instead of the Gold leaves in Cavetto's Elects — if very fine threads steeped with glue be used, the embrocment will be found nearly as sensible as with Slips of Gold leaf. —

466 In the Electric experiment with the glass tube and feather, if the tube be moved round the feather, the latter turns round its axis keeping the same side towards the tube.—

467 The writing paper used by the Boermahs consists of the bark of a particular tree, flatted and dried. This is rubbed over with charcoal and the charcoal is rubbed in with the leaves of a particular tree, ~~of~~ containing, no doubt, a Germany or resinous substance.—

468 In the case of oblique angled plane trigonometry, where the three sides are given to find the angles, the supposition of the ~~base~~ perpendicular is falling without the base is of no use, because a side may ^{be} assumed, in any ~~case~~ ^{case} for the base so that the perpendicular will always fall within the triangle

469. Water may be kept in open tanks made of wood lined with sheets of tinned copper, perfectly sweet ^{during} the longest voyages—For this discovery the Society of arts has given to Genl. Benthon this gold medal

470 The Retina of a sheep's eye had been preserved for some time in water. About half the water ~~water~~ was taken out and the vessel filled up with spirit of wine, in three days the Retina was totally dissolved in the water—

471 A change of air or place is such a removing from the Country to town going on board a ship is generally followed by a certain habit of body. This has several times happened to me on moving from one house to another. On the 1st of March 1805 I moved from ^{the 39} Lyons Place to ^{the} 5 Crooked Lane in Calcutta, and had no ~~was~~ ^{was} ~~was~~ for the 1st to the 5th this regularly afterwards I leave the cause

