

Thursday 22^d July 1800

M. Pond's Lecture on Astronomy

Introduction - State of the Science previous to Newton. Of the great change which his Discoveries have effected in it. Of the inference that may be drawn from the apparent Diurnal motion of the Heavens. Opinions of the ancients on this subject. Investigation of the Motion of the Sun. Of the Instruments employed for this purpose by the ancient and modern Astronomers -

Instruments made use of in the Lecture
Celestial Globe - Gnomon - Circular Instrument -

Royal Inst 24th Dec. 1800

M. Davy's 2 Lectures on Experimental
Chemistry - Chemical attraction. General
facts of this power illustrated by Experiments
Large and expensive apparatus not necessary

A few sheets of glass tubes and Florence flasks
will serve for the most useful experiments.

Bucher, Priestly ^{and} many other eminent chemists
had no Laboratories. (Davy says he began his studies
without either an apparatus or the least knowledge
of Chemistry. Two of the most eminent Chemists in
this Kingdom have no other Laboratory than common
stoves with fire places in them. -

Chemical attraction.

- Exp 1. Salt in water - solution. - Glass basin
2. Sulphuric acid into sol: Pot ash - Solid formed
3. Sulphuric acid on solid Lime - Absorbent
4. ~~Sol: of~~ ^{Sol: of} Lime on sol: of pot-ash solid
5. Sol: of pot ash on ^{Sulphuric acid} Magnesia - Sulphat of P. A.
6. Sulphure burned in Ox: gas - Sulphuric acid
7. Charcoal in Vitell - Carb: acid gas.
8. Nitrous gas into ^{nat: air} Oxygen Gas. - Nitric acid
9. Muratic acid gas into Ammoniacal gas. - Solid
formation of Ammoniac.
10. To Dept seventh, Metal of Pot ash was
added to decompose the Carb: acid which could
not be done till the latter had decomposed
of the Alcohol - This was proved by the breaking
of the vessel. -
11. Compound affinity - Dept: only described
small glass vessels with large stopcocks were made
use of for Experiments on the gases.

Is this all: an ultimate quality or property
— Electricity — Negative and positive — produced by
the common machine — Not to be considered as a
fluid or in a state of combination. —

— All of bodies possessed of Chemical affinity are
in opposite states of Electricity and this affinity
is dependant on their state of Electricity. This
was illustrated by various Experiments which
prove that bodies which have their states of Elec-
tricity altered by means of the Galvanic Apparatus, have
also at the same time their Chemical affinities
altered. Thus a body which is naturally positive
but in a low degree, will have a weak affi-
nity for oxygen which is naturally negative; but exalt
this naturally low ^{positive} state by means of the appa-
ratus and its attraction for oxygen shall be
strong in proportion. For Example Silver which
is naturally positive in a low degree, is in-
capable of acting on water; but if you exalt
this nat. state by means of the Galvanic ap-
paratus it will become capable of extracting
the Oxygen from the water.

— Mr Davy also stated, that as a further illustration
of the theory, that if the states of bodies which
naturally possessed strong chemical affinities were
by means of the apparatus entirely reversed, the
consequence would be a disunion and disturbance
of the compound, which they formed in consequence
of their Nat. affinities. To prove which the
following experiment was performed.

— Mordant Sulphat of pot ash was placed on
the Galvanic circle and presently it was decomposed

pot ash appearing at the negative, and Sulph:
acid at the ^{Positive} ~~Positive~~ plate - This effect is produced,
according to Mr. D. by the action of the G⁺ appearing
in excess in state of Elecⁿ in the sulph⁺ acid the
reverse of that which is natural to it, and the
same in the positive pot ash; and consequently the
two substances instead of combining, actually repel
each other, and are found on opposite ends of the cup
in which they were placed in combination, the acid
at the positive, and the potash at the negative side

+ In this theory it may be objected that if the
Electricity in both bodies be changed and the
acid be become positive and the Alkali negative
then, from the theory, they, being contrary, should
unite as before. —

++ These objections to Davy's Hypothesis were stated
by a Gentleman in the Phil⁺ Magazine under the
signature of Auditor.

Thursday 5 Jan. at 2 o'clock W. Bond
 Whomsey Sect 2. Investigation of the Nature of
 the Sun's Apparent Motion whist. Machine to it-
 include the Hypothesis of Ptolemy and the Annual
 Anomalies. Of the Rotation of the Sun on its
 axis; its magnitude and distance. Of the Moon;
 its Mass and Motion.

Instruments — D^y of 10 inch Globes
 Gnomon — Circular Instrument — Two cups
 to represent the Equator and Ecliptic.
 Menstruum (common) fitted to represent the
 Ptolemaic System — Earth in the Centre,
 a new arm with the Sun on the Extrami-
 ty of it, and an inferior planet in the
 middle — Inclination of the Eq^r to the Eclip^t
 Long. Lat. Dist. Right ascension — Occurrence
 of the Equinoxes — Days and Nights.
 Terrestrial Telescope, its ~~own~~ construction
 and use — five wires in the Telescope.
 Distance of a Star from the Sun — Length of
 the pendulum in interval of the passage over
 the Meridian —

— Potassium in Carbonic acid gas decom-
posed it, pure pot ash and carbon were pro-
duced (this experiment failed at last lecture).

— Copper and burned in Oxim: and
Gas.

— Nitrogen Gas extinguished a taper.

+ W. Davy replied to the objection in the
Philosophical Magazine, and showed that
the acid in the Sulphat of pot ash is attracted
by the positive pole, and the Alkali by the negative
pole of the battery, more powerfully than the
acid and alkali are attracted by each other, they
must consequently separate from each other,
and the salt be decomposed. —

+ Nitrogen and oxygen gas in the proportion of
79 to 21 by measure were mixed and formed Atmos-
pheric air, proved by a taper burning with the
same light as in ^{at.} air. —

— Supporters, as in Thomson's theory of Combustion,
not necessary Potassium burns in Carb: and gas.
which is not a supporter of Combustion. —

Saturday the 7th Jan^y at 2 o'clk Mr. Davy
 Agency of Oxygen as ~~effects~~ opposed to other
 bodies in Nature. Combustion illustrated
 by Electric facts and Chemical Experiments

— Atmospheric Air - Impurities of the
 subject - Life - heat - sound. Concepts supposed
 to underlie. some thought it was derived from
 water. Discovery of the Air pump, preparation
 and spring of the air. Part only of the air
 employed in breathing - discovered by
 $\frac{1}{4}$ of the quantity, called Oxygen Gas.

Discovered by J. Priestley and ^{Mr} Scheele about
 the same time and without any knowledge
 of each other. Atmospheric air consists of
 21 parts Oxygen and 79 of Nitrogen by
 measure. The variations from these are
 very trifling, they seldom exceed 1 part of Oxygen
 - Methods of preparing oxygen gas - Vermillion
 Red Lead - Manganese - Nitre, and Oxymuriatic
 acid of Potash, this the present.

- Experiments -

- Paper in a jar of Oxygen Gas
- Oxidation of Oil and Phosphorus in a glass of water,
 sulphuric acid through a tube - fire in water
- Wire burnt in Oxygen Gas
- Mixture of Oxim. of P. A and loaf sugar
 a little Sulphur acid from a glass tube - fire

Royal Institution Sat. 14 Jan 1809
M. Davy's ^{fourth} Lecture on Exp. Ph.

Inflammable bodies; their nature. Metals;
their Electrical and Chemical powers. General
distinctions of inflamm. bodies as opposed
to Oxygen, illustrated by Experiments. —

— Atmosphere air long known to be
nearly to combustion — Oxygen Gas. —

Inflamm. bodies — first, by the Ancients, derived
from heaven from the sun. Principle of
inflamm. — Candide Philosophia — Exp.

— Hydrogen Gas most inflamm. substance
when hydrogen gas is burnt in a glass
jar moistened — Exp. — Same when mixed
with oxygen. Exp. — W. Cavendish first show
that water was the result of burning Ox-
gen and Hydrogen Gases. — Water Decomposed

Exp. — Gun barrel bent — Carbon next in
flam. substance — Not a simple substance
contains Hydrogen — Exp. — (Diamond contains
a small quantity of Oxygen, hence its great
difficulty in burning) — Light and heavy

Hydrocarbons Hydrogen Gas — Exp. — Gas
oxid of Carbon — Exp. — Olefant Gas — Exp.

Potassium attracts oxygen from every other
substance. Now several experiments on
Charcoal, Carbonic acid &c with Potassium which
is the most inflamm. substance known

Royal Institution 1809

12 Jan

M. Pond on Astronomy 3 Lectures

Continuation of the former Subject -
of the moon - Its Phases - Investigation of the
nature of its Orbit - Lunar irregularities.

— Two Schemes paper pasted on board
establishing the phenomena of the moon's mo-
tion and phases - Elliptical orbits of the Earth
and moon - Obliquity of the Earth's orbit - length
of time till it become least - whole revolution -

on the inside, occasioned by the cold produced
by the evaporation of the Ether. —

— The Phlogistic system may with certain mo-
difications be maintained. M. D. gave a speci-
men of the manner of reasoning in this way,
which however is not so satisfactory as the Anti-
phlogistic —

- Coal sufficient substance, - when burning there may be seen the Hydro-Carbonet, of both sorts granular sized of Carbon &c by the colour of the flame. In burning certain substances of the coal kind the smoke passes of without taking fire - well known experiment of throwing a piece of burning paper to set the coals to on fire - Coal used about 200 years. was thought prejudicial to health - had more so as it produces more of the Pyro-lignous Acid -

Gas Light - Exp. first tried by D. Clugton - afterwards by Mr. Murdoch, John - Manchester - Savings - One burning vessel to light the whole town, as ridiculous as the scheme for regulating the weather by Artificially, lately proposed. - Observation of the consumption of all the coals in Britain unaccounted - State of metal preparation and cropping in various directions. The State of coals horizontal or nearly so. Calculated from 40 square Miles, consumed $\frac{1}{4}$ mile in 50 years. The whole in 2000.

Detached Exp^t

- Water decomposed by Elec^t - and Galv^{an}
The results found by Elec^t -
Galvanic Battery laid on the floor - four troughs of 50 each, 2 inch plates.
This battery fired charcoal ^{Potassium} in the upper part of a barometre tube. in vacuo
- All gaseous substances contain water. Exp. moisten the outside of a retort containing a gas, with Ether then will appear moisture

Royal Institution Thursday 19th Jan^r 1809
4th Lecture on Astr. M. Dowd

Rotation of the sun on its axis, determined by
the path described by its spots, Solar Atmosphere
and Zodiacal light. Solar and Syderial days.
Equation. Of the moon and its Phases.

(Dr. D. did not attend this ~~the~~ lecture.)

Exp. Chem^y
Saturday 21st Jan^r 5th Lect. on ~~Chem~~ M. Davy

Inflam^{ble} substances continued. Formation of
acids. Properties of acids. New Experiments on
this subject. Ovens respecting acidity. Water spent
to ~~exhibit~~ this property.

In this lecture Sulphur and Phosphorus
were considered

+ Sulphur known to the ancients and applied to the
same uses as at present. — Found in many
parts of the world — Volcanos — prepared arti-
ficially in England from Pyrites, and at Paris
in mountain, in N. Wales it is sublimed from the
copper ore. A vessel shown, in which the production
of Sulphur from Pyrites had been effected, Sulphur
sublimed in the neck. — In burning Sulphur
~~was~~ some degree of acidity was perceived on the
objects with which the smoke came in contact
instantly it was ~~concluded~~ ^{concluded} many attempts were
made to condense the acid, but on being the
sulphurous. At length it was found that
Sulphur burned with Fe too was produced

produced Sulphurous, and with a greater heat
Sulphuric acid, the former being Volatile the
other fixed - Scheele's Theory - Lavoisier's Theory
- Sulphur hitherto considered as a simple substance
the present state of Chemical science proves it to
be a compound - A triple compound - consisting
of Oxygen, Hydrogen, and an unknown base, proba-
bly an inflamm^{ble} substance - Acids character
some last - This not always the case, some acids have
nothing some in the last

- Convert the blue vegetable colour into red - Test paper -
If the acid be strong and the paper be dry, no change
of colour takes place. Exp. Oct. acid and test paper -
None water is necessary to this effect of acids - No attention
has been paid to the Chemical properties of
colours, when these shall be better known, it will perhaps be
not very difficult to explain the effects of acids and Alkalies
on colours. -

+ Phosphorus - History - Fable of the man who on
his death bed, told his sons that he had buried a treasure
in one of his fields. ^{It was under the surface} On this death, the sons set to work
in turning up the field again and again, they did not find
the treasure, but they had much better crops than their
neighbours - Now the history and progress of the discovery,
which is well known - Phosphorus made in a small stone
retort, The neck of the retort was broken to take out the
Phosphorus. - Purified through leather in hot water.

- If Phos. be burnt slowly it produces phosphorus,
if rapidly, phosphoric acid.
- If Phosphorus be burnt ^{with potassium} in Ovens, both Oxygen and
Hydrogen gas are produced - This experiment was performed
in a small retort furnished with a stop cock by which it
was exhausted by a small air pump - The same Expt.
and result from Sulphur - Some Sulphur and Phospho-
rus instead of being ^{simple} substances as is commonly supposed, are

Triple compounds, consisting of Oxygen, Hydrogen and an unknown base, which, most probably, is inflamm. —

— Sulphureted and Phosphoretted hydrogen gas prepared
The Experiments on the latter are said, by M. D. — to be the most curious and entertaining in Chemistry. — Several several of the result — The gas in making from Phosp. and ^{ferrous} Kali in a small retort escaped in several conversations into the atmosphere. — Fire at top and bottom of a glass of water

* In preparing Phosphoretted Hydrogen gas, the retort should be full to prevent the inflammation in the retort. This is effectually done by filling the retort with ~~some~~ Hydrogen gas. —

+ Mr. Darcy thinks that the luminous appearance of fish rotten wood, with the wisp and other ~~phenomena~~ phenomena of the kind are all phosphoric. — and thinks the objection ^{to} for the fish appearing luminous in water may be obviated by supposing the phosphoric matter very much diffused in the body of the fish. —

Royal Institution - 1809

Thursday 26th Jun^y. Astronomy 5 Lecture

Irregularities of the moon's motion compared with those of the ^{moon} sun, its parallax and distance. Solar and Lunar eclipses (the last article tho' in the course, not introduced into this lecture.)

Phases of the moon illustrated by a ball one half black, the other white (similar to mine) only put on the planetarium and moved by the wire - Motion in the Orbit irregular - Retard^d in the 1st and 3rd, and accelerated in the 2nd and 4th quarters - Cause - Greater part of the earth's orbit remains always the same, but the breadth of the orbit or mean distance increases. To this tendency of the orbit to a circle is owing the moon's acceleration

Royal Institution 20th Jan: 1809.

Let 6th Experimental Chemistry by W. Davy
Continuation of the subject of inflamm^{ble} bodies and the
compounds. Nitric acid - Compounds of Nitrogen;
experiments on their properties. Decomposition of
fluoric acid. -

Nitric acid - ~~formed~~ - compound of Oxygen and Hydro-
gen. Nitrogen how made. Muscular fibre and
nitric acid in a small extent, or by burning phos-
phorus or any other very inflamm^{ble} substance in
close vessels filled with Atmospheric air -

Properties of Nitrogen. Kills animals, hence is called
azotic. This not proper, for some of the gases ^{are} more
noxious. Compounds of Nitrogen and Oxygen forms
Atmospheric air, nitrous oxide, Nitrous Gas and Nitric
acid by, only, varying the proportions - Nitrous oxide
made by exposing Nitrate of ammonia in a glass
retort to the moderate heat of a patent lamp (not above
400°) with a metal chimney, or ^{the} water cistern, in
the usual manner. Properties of Nitrous oxide
Paper burns brighter than in Atmospheric air -
Effect when breathed, very extraordinary. Different
in different persons. Dr. Mitchell thought it con-
tagious - to be the very contagion of the yellow fever
Davy breathed a bag of it without much effect
sensations rather pleasurable. ^{When} it produces
violent effects Mr. D. thinks the gas is not pure

A bit of Sulphur burning freely was extinguished
in Nitrous oxide, but when ^{lighted} burning ~~more~~ more
strongly, on immersion into the gas it burnt
with brilliancy. - Capt - Nitrous acid poured gently
into a phial holding a small quantity of Alcohol
a metal tube put thro' a common cork in the phial
upheld, a stream or column of flame 10 or 12 inches in

light, continued to burn for several minutes, towards
the end, a noise and sparkling. - beautiful capium
- Fluor acid decomposed by potassium.

Process. A small bit of potassium was put into
one of the retorts with brass stopcock. This retort was
first filled with hydrogen gas to expell all the
atmospheric air. It was then exhausted by the
small bell air pump. The retort was now filled
with fluor acid gas from a jar with a stopcock
on its top. The retort with ~~with~~ the potassium
was held over a lamp, when the potassium took
fire and produced potash and a black matter the
base of the acid. The acid therefore consists of oxygen
and a particular base, the properties of which have
not been examined. -

+ Nitrous oxide with hydrogen gas in a tall
tube inflamed by the discharge of an electrical
spark -

Royal Institution 31st Jan. 1809

Lecture 1st on Perspective - by M. Wood

Introduction. Nature of the picture. Definitions &c.

- Short history of perspective - Definition -
Picture - Object - Definitions - angles, right
acute, obtuse - perpendicular - parallel lines

Names, perpendicular, horizontal, oblique - Picture
always on the perpendicular plan interposed be-
tween the eye and the object - Horizontal planes
pass through the eye of the spectator. This plane
may have different heights. One third is in general
reckoned a good height for the eye. In drawing the inside
of Gothic buildings, the position of the eye may be
lower. Distance of the picture and object, must
vary according to the size of the object.

Royal Institution Saturday 4th Feb. 1809

Experimental Chemistry Lect 7th M. Davy

Muriatic acid; its combinations - with water - with oxygen. New experiments on this subject.

Decomposition of Boracic Acid, and its re-composition.

History of Muriatic acid. Glauber the first who discovered this substance, and who first produced it by decomposing common salt by Sulphuric acid - Glauber's salt. This process is still the best.

This acid is found only in a state of gas. Water absorbs ^{this gas} it very rapidly. It must therefore be preserved over mercury - M. acid gas is capable of combining with oxygen in two proportions, oxygenized, and superoxygenized M. a. gas. Mode of preparing ^{the latter} - Common process - Applied to bleaching - At first it injured the cloth, this prevented by passing it through lime water - Injurious to the lungs of the workmen - M. Davy recommended Ammonia to be put mixed with the gas in the room where paper is bleached at a paper mill. The ammonia prevents the pernicious effects of the acid by uniting and precipitating with it in ^{white fumes} which are mixed of ammonia. The paper ^{is improved} for makes ^{it} better that it answers the purpose

Muriatic acid gas is very unburning; but superoxygenized gas promotes combustion. Many inflamm^{re} substances take fire in this gas, even at the low pressure of the atmosphere - As this gas is very harmful to the lungs, M. Davy has contrived a new ^{app.} ~~mode~~ for burning bodies in it. He puts the vessel e.g. Gold leaf into one of the small retorts which he has used in many

of his former experiments, having a large stop cock fitted
on the extremity. He exhausts the retort by a small table
air pump, and then screws it on the top of a large jar
containing the ~~the~~ ^{the} gas. By opening the communication
between the retort and the jar the former is filled with
the gas which inflames the ^{leaf}. Several metals were burnt
in this way, but not so brilliant ^{with} as when the metal is
dropped into the gas in a common phial or jar. —

— Musiac acid gas contains a great quantity of water
perhaps a third of its weight. Mr. D. has not been
able to produce it from water in its uncombined
state, but by uniting this acid with Phosphoric
and phosphoric acids, sulphuric acid and phospho-
rus, he obtained fluids compounds ^{from} ~~from~~ water.
These compounds even ~~to~~ when fluid, though composed
of matter supposed to be intensely acid, do not
act on Lignum or Depolme alkaline, and are non
conductors of Electricity; but a very small quantity
of water develops their energies, ~~makes~~ ^{renders} them conduc-
tors, and makes them capable of acting violently
acting on Lignum paper and alkaline substances

— Exp. — Potassium decomposes most violently with
these compounds of musiac acid, even at common
temperatures. Exp. a small bit of potassium
was dropped from the hand into one of these compounds
the report was as loud as that of fulminating
silver. Mr. D. informed us that in making the only
experiment he had tried before the lecture, the re-
port was broken with such violence, that he would
not venture to perform the experiment in the same
manner again. The ~~result~~ result of this experiment
Mr. D. thinks may probably show that the musiac acid
has been decomposed. —

— Boracic acid was decomposed in a manner similar to that
of the fluoric in last

Royal Institution Thurs. 7 Feb 1889

Lect. 2 Perspective M. Wood-

Theory of vanishing lines and points

Definition of last lecture recapitulated

Royal Institution 9th Feb^y 1809.

Astronomy Lecture 6 - W. Pome

Solar and Lunar eclipses illustrated by Machinery. On the figure and Magnitude of the earth. History of the various operations that have been undertaken by different nations to determine the Dimensions of the earth.

- Lunar and Solar eclipses described by a figure as usual - by an instrument ~~of~~ the same form as Martin's planetarium, but containing only the annual motion of the sun and monthly motion of the moon. The direction of the sun is represented by a wire which should be produced to an Earth's orbit. The moon moves on an inclined circle round the earth ~~earth~~ in the center of the instrument both the earth and moon are very small - Remarks upon the absurd constructions of the common Telluriums, of the Shops. - Calculations of eclipses very difficult - The same in the Ptolemaic as in the Copernican System - Ancient could not calculate eclipses - Accounts of their having done so to be received with great caution. Antiquity of the Chinese and Hindus Art? Doubtful - Bailin - History of the ancient methods for measuring the circumference of the earth; Eratosthenes &c and John Norwood the first English Astronomer - His method the best Distance between London and York - It is not known who Norwood was - His name counts high as a man of science.

Saturday ^{the} 7th Feb^r 1809. Royal Instⁿ:

Experimental Chemistry Lect 8th M. Davy
Metals. Amorphous metals. Experiments on
their combustion and solutions. View respecting
the elementary matter of metals.

Properties of the metals would require a course
many courses of lectures to discuss. General
properties, great weight, this seems the discovery
of the new metals seems to be a characteristic
property of metals, for Potassium is a very light
body: It is to water as 6 to 10. Inflamⁿ: a
property of all metals. Experiments showing the
inflamⁿ: of several. Iron burnt in a furnace
Copper on charcoal with a stream of Oxygen
gas. Glass pipe fixed to a gargonete - Gold and
silver leaf burnt by the Galvanic Battery - 10
troughs, 25 from each. Inches square arranged
in three rows of three ^{troughs} each, with one trough across
the end - Inflⁿ: of Potassium shown by throwing
it into water, after two or three seconds it exploded
with a smart crack - Iron wire burnt & its
Ox: gas - Metals soluble in acids, oxidized,
iron unites with the oxygen of the water, the
Hydrogen set free in ^{hydrogen} gas. - Metals
precipitated various ways - Copper by iron
Exp: a little sulphat of copper poured on a plate
of iron, the iron becomes coated with copper
(transmutation). - Sulphat of iron precipitates
Gold from its solution in its metallic form
Vol: alkali in an acid of Gold, Lime water

precipitates silver in an oxide - fulmenatory gold
and silver exploded on paper over a lamp. In an
exhausted retort the fulm. silver was also burnt.

— process of refining Gold and Silver briefly explain
Cupellation - Cupels shown. — History of the metals
Gold and Silver first known, in the early ages of the
world - used first for ornament - brilliancy.

Copper - tin first account of tin mines in Britain
Shabo - square blocks, still made in Shabo Discombe

— many new metals lately discovered - list of
all Potassium and Sodium by Mr. Davy.

+ The detonation of fulmenatory gold has been the
instrument of much Deceit with the Alchemists
when he finds that no more money is to be
squeezed out from the pockets of his employer, he
contrives to explode the retort and shows partake
of the gold scattered about by this terrible accident.

— The idea of the Philosophers stone was absurd; that
of the smooth alchemists was far otherwise. — Every metal
grows from a kind of seed, that of Gold requires
a long time to be matured. They process may be
assisted by art &c. — The contrary to this would
be proved. — Should Gold be ^{con}found to be a com-
pound substance, from that moment the possibility
of making Gold will be fully established.

+ The ancient Romans were acquainted with Bes-
beth, Cosmick - Juvenal - powdered antimony
made use of to paint black, the inner part of the
eye to make the pupil and iris look more
brilliant - never used in Britain - no account of
it.

Royal Institution Sunday 14 Feb 1809

Perspective 3 lectures - Mr Wood

- Description of parts of last lecture

- Applications of the principles of perspective
to practice

Made of hanging down a picture a point
on the picture - Representation of a square
in different positions - Flowers in perspective
shown.

Astronomy lecture 7th Feb. 16th 1800 - Mr. Don

Continuation of the former subject of the measure-
ment of the Earth. Of the operations that have
been carried on in different countries to determine
the dimensions of the earth. Of the different methods
of finding the latitude and longitude of places on
the surface of the earth.

- In this lecture were shown an Astronomical
quadrant which belonged to Capt. Cook, a large
theodolite, two circular Instruments, and the
Borda repeating circle. - The modern method
of measuring an Arc of the Meridian - Transpa-
rance - base of verification - French and English
measurements - French instruments much superior
to the English &c &c

Royal Institution 10th Feb^r 1809
Experimental Chemistry Sect. 9th - M. Davy

Metals substances continued. Commencement
of the investigations respecting the metals of the
Alkalis. Potassium. —

Description of Alkaline bodies - Principal prop-
ties - fixed - volatile - Vegetable, mineral, their de-
vision improper - Method of preparing the Alkali
Pot ash and Soda, pure. Former attempts to de-
compose the Alkali - What induced M. Davy to
attempt the decomposition by galvanism -
The Experiment shown. 11 troughs of 25 pair each
6 inches square - conductors copper wires, with
two short wires of platinum hooked to the copper wires.
The pot ash was decomposed in a minute or so.
The pot ash was recomposed by heating a bit of potas-
sium in a small retort filled with ~~oxygen~~ oxygen
gas. It was shown by test paper that it was pure
pot ash - Pot ash and Soda articles of great
importance in Manufactures - Bleaching - Glass
making described - Kirwan's account of the origin
of Glass - Merchants, ^{Water} Soda to cook their victuals.
Liberius's glass cup with a handle cost 50,000
L^{ds} pounds - Great utility of glass - Discoveries in
astronomy, Chemistry &c. - The great demand for
the Alkali has given birth to different methods
of decomposing Sea Salt to obtain the Soda
Two processes described - M. D. thinks that

The new Discoveries in the class of Alkaline Bodies
may probably lead to a more Economical mode
of Efflux than Decomposition.

Tuesday 21st Feb. Perspective by M. Wood

The perspective of regular and irregular
buildings &c &c

(Did not attend this Lecture.)

~~+ Did not attend M. Wood on Monday last 20th Feb~~

Royal Institution Thursday 23rd Feb. M. Poore
Mth Lect 0 — Continuation of the Subject re-
lative to the figure of the Earth. Consequences
arising from its spheroidal form. Of the Diff:
methods of finding the Latitudes and Longi-
tudes of Places on its surface.

Short recapitulation of last Lecture — ~~Monday~~
Principal measurements for ascertaining the
magnitude of and figure of the Earth — French
Measurement by Picard and others. English Do.
on Blackheath, compared with the French, carried to
the Pyrenees and relayed through Spain

(Difference between the French and English Do.
is found by the French Measurements to be
1^m 9^l 21.4 in favor of the Eng^l 9^l 19.5 — By D. Marshale
Art. observatⁿ 9^l 20. probably the account of the truth

- From the result of all the Determinations it appears that the Difference between the Polar and Equatorial axis is about 12 miles, and that the Spheroidism of the earth is not regular that is the meridians are not in any part of the surface, Ellipses. - These planes may be cast on each of a meridian of the earth, and yet contain the same celestial meridians. - Several Drawings made use of. One an Ellipse with two curves like Cycloidal Arch below the center. The Ellipse described by the dotted string. - Another figure to illustrate the effect of gravity on the pendulum in different latitudes.

+ At last lecture in describing the measurement on the Cordier, M. D. informed us that an obelisk or Obelisk was erected at each end of the line with plates full of high incense on the King of France and French Mathematicians. The Spaniards thought the prizes too limited towards their nation, and have since destroyed the towers. + Earth now covered with a fluid, of g. m. P. and

- Methods for finding the Latitude - Gnomon - Altitude of the Sun or Star - Shadowed Dead-cent - Circular Instrument - French call the height of the pole the Latitude - The English the Distance of the Zenith from the Equator. They are the same in quantity. Longitude by explosion of Gun powder or any other instantaneous phenomenon. - By a Chron. and by Lunar Observations. - The same instruments on the table as at last last Lecture.

Royal Institution 25 Feb. 1809 —

Experimental Chemistry Lect. 10th — Mr. Davy
Potassium continued. Preparation by Chemi-
cal means. Sodium, its properties. General views
connected with the decomposition of the fixed Alkalis
— Howberg's Pyrophorus. Different modes of preparing
it. Ancient methods of accounting for its nature:
imperfect. Mr D thinks that in the process of preparing
it, Potassium is produced. A compound of Potassium
sulphur and ~~potassium~~ produced a substance of the
same kind as pyrophorus — Prepared a large quan-
tity of Potassium by the French or chemical mode.
(see Davy's app. in his paper) Phil. Magazine
Vol. 32. — Experiments on Potassium and Sodium
mixed in different proportions, several of them very curious
— Mr. Davy concluded the lecture with a philippic a-
gainst those persons who are perpetually asking what
is the use of such discoveries. He acknowledged that
such ^{very} quantities produced at first some irritation
but he now &c. &c. — Suppose a person should ask
what is the use of painting, Matruary &c. &c, He
would be considered as a Goth and Barbarian. —
He Mr. D. did not mean to elevate experimental
Philosophy to the level of the least of the fine arts.
— Its great utility to society. Even the late discovery
already seen to point to improvements in some Manu-
factures &c. — Success of Bacon & Newton —

Tuesday 20th Perspective Lecture 5 Mr Wood.

Perspective of objects ^{upon} inclined planes. Applications
of the circle &c. &c. — Did not attend this lecture

1809

Royal Institution Thursday 2 March
 Lecture of Astronomy - W. Bond.

On the Planets and other bodies of the Solar System. Various theories which have been invented to explain their motions.

- Planets distinguished from the fixed stars by their motions - Revolution of the stars regular - Planets not prop the fixed stars at different altitudes. The ancients supposed the planets to lose part of their light when they become stationary, for in the middle between the two stationary points the planet was brightest. This is certainly the case for the planet ^{then} nearest to the sun. Figures of the orbits of the inferior planets Mercury and Venus, copied from the planetarium on paper - Phenomena the same in the Ptolemaic as in the Copernican Syst.
- Quantity of a planets retrogression depends on the velocity and distance from the sun. In general the nearer the sun the greater the Rⁿ - Observations on the superior planets, Mars Jupiter and Saturn and the geometry. The earth cannot be the center of Mars's orbit for in one point of his orbit his (diam.) is in another only seconds. Jupiter flattened at the poles - Observations on Saturn - His ring an extraordinary phenomenon. Its nature and use wholly unknown - Rotation of the planet - Rotation of the ring - Ring consists of two parts, discovered by Herschel.
- Calculations of the figure of a planet from its velocity on its axis - two answers - This illustrated by Algebrae quadratae Equⁿ - here one Equⁿ equⁿ absurd or impossible. Some however both are possible - as in Clavius's calculation of Earth's

Royal Institution Saturday 2 March 1809
Lect: 11th Experimental Chemistry. Decomposition
of the Earths. Metals of the Earths.

The Decomposition of the Alkaline Earths
requires a greater Galv^y power than the Alkalis
- Battery of 20 Troughs each 25^{inches} ^{of 4 inches square} employe $\frac{54 \text{ that}}{= 10,800}$
More the Alkaline earths enumerated. -
- Barytes decomposed - metal - several experiments not
- Mercury on the Barytes as an edge as in the
Swedish manner, greatly facilitates the decom-
position - Strontites - Magnesia, decomposed
+ These new discoveries promise many improvements
in Arts and Manufactures - Potassium will pro-
bly be employed to ^{produce} decompositions of great use in
the Arts and Manufactures. Many phenomena
of Nature more satisfactorily explained - Volcanoes.
G. Maskelyne found the general ^{in mass} gravity of the Earth
more than the gravity at the surface. Hence it
is probable that the interior parts consist of me-
talic substances. When through cracks and fissures
air and water have access to them, inflammation takes
place, hence have and all the products of an erup-
tion - Meteoric Stones may enter our Atmosphere
in a Metallous state, they will by the action
of the Air or fire become inflamed - earths. -
The phenomena attending the stones that fell
in North America described -

Royal Institution, Tuesday 7th March 1809.

Perspective. Sect. 6th - Mr. Wood.

The groined arch. General application of the line
of Elevation. Steps in different positions &c. &c.

Astronomy Sect. 9th & 10th Mr. Dove.

On the new planets. Comets. Stones fallen
to the Earth. Fixed Stars.

Five new planets - Georgians discovered by P. Lalande
in 1780 - C. Satⁿ - Their orbits perpendicular to that
of the primary planet!! Period - Distance from the
Sun &c - Ceres discovered by Piazzi in 1801. 6th
between that of Mars and Jupiter. Analogy sup-
posed a planet in that space, not from any demon-
stration of the necessity of the thing, but from the
magnitude of the space between these two planets.
Soon after the discovery of Ceres another planet
was discovered by Dr. Olbers, a German Astronomer.
Pallas is at the same distance from the Sun
as Ceres and they describe nearly the same orbit
Their nodes are the same, the eccentricities are different
These bodies are very small, much smaller than our
moon. Doctor Olbers thinks that they are fragments
of some larger planet by an explosion. He endeavours
to demonstrate that the position of their orbits would de-
pend on the force and direction of the explosion, but
that they would pass through the same node. This theory

was rendered at least probable, by the Discovery
of ^{a third} another planet near the node of the former - Stones
- Stones falling from the heavens, have been mentioned
by many writers of antiquity, believed by them to be
but rejected as vulgar errors, by Philosophers.
The instances that have happened lately have put
the matter beyond dispute - ~~Mr. D.~~ Mr. D. thinks
they have fallen from some of those captured bodies
- Comets. Ancient opinions respecting them - Metons -
Kepler thought they move in straight lines through
our system and never return. Newton says they
move on courses round the sun, Parabola, Hyperbola
if in these they never return. Ellipse very uncertain
- Mr. D. thinks the comets cannot all belong to our
system the number is so great. A comet appeared
in 1770, the period was calculated to 5 years, but it
has never since been seen. - The tails or train of light
attending a comet has not yet been explained. Mr. D.
says he cannot form any theory to account for it.

Royal Instⁿ 11th March Mr Davy
Exp^t. Chemistry Sect. 12th - Metallization of
Ammonia. Experiments on Am^a. New
view concerning its Elementary Matter. Decom-
position of Nitrogen. General ideas flowing from
the new facts. - Conclusion of this course.

History of Am^a - Scheut and Priestley; Dis-
covery from Ammonia Gas. - Decomposition of
Am^a often attempted. History of these attempts
led by Berthollet - Results. Am^a is composed
of Nitrogen and Hydrogen - Objections to this.
Mr Davy finds Oxygen in Am^a and a
Metallic Base - Several Experiments on
Ammonia - Potash used - Three different
modes of attempting the decomposition of Am^a
all shown in the Lecture. Mr Davy decom-
posed Am^a by Potash. Recomposed. - Used the same
kind of small retorts as in his former Experiments
- Observations on ^{the} probable utility of these Discoveries
to Arts and Manufactures. It has been supposed
there was only one original kind of matter in the
universe, and that the great variety of bodies arises from
the different combinations of these particles. If this be a
dream it is the dream of Newton - Concluded the
course.