Thursday 22 Oct 1800

Mr Ponds Lecture on Astronomy

Introduction — State of the Science previous to Newton. Of the great change which his Discoveries have effected in it. Of the inferences 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 the Lecture Celestial Globe — Gnomon — Circular Instrument —

Royal Inst. 24th Oct. 1808

Mr. Davy's 2 Lecture on Experimental Chemistry — Chemical attraction. General facts of this power illustrated by Experiments

Lays and expensive apparatus not necessary. a few phials, glass tubes and blowpipe stand will serve for the most useful experiments. Becher, Priestley, Black and many other eminent chemists had no Laboratories. (Becher, says he began his chemical researches 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 closets with few shelves 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 — Alabaster
— 4. Muriat of Lime on Sol: of pot-ash — Solid
— 5. Sol: of pot ash on Magnesia — Sulphat of P.a.
— 6 Sulphurous burned in Ox: Gas — Sulphuric ac
— 7 Chalk in Dilto — Carb: and Gas.
— 8. Nitrous gas into Oxygen Gas. — Nitric acid
— 9 Muriatic acid Gas into ammoniacal gas. — Solid muriate of ammonia.
— 10 To Exp. seventh, Metal of Pot ash was added to decompose the Carb: and which could not be done 'till the Carb: Gas was decomposed by the Alkali — This exp. proved by the breaking of the retort. —

11. Compound affinity — Exp. only described small glass vessels with brass stopcocks were made use of for Experiments on the gases.

Is this att.ⁿ an ultimate quality or property
— Electricity — Negative and positive — production by
the common machine — Not to be considered as a
fluid or in a state of combination. —
— All the bodies possessed of Chemical affinity are
in opposite states of Electricity and this affinity
is dependant on this state of Electricity. This
was illustrated by various Experiments which
prove that bodies which have their states of Elec.ⁿ
altered by means of the Galvanic apparatus, lose
also all the combinations their Chemical affinities
altered. Thus a body which is naturally positive
but in a low degree, will have a very weak attraction
for oxigen which is naturally negative; but exalt
this naturally low positive state by means of the appa-
ratus and its attraction for oxigen 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.l state by means of the Galvanic ap-
paratus it will become capable of extracting
the Oxigen from the water.
— Mr Davy also stated, that as a further illustration
of the theory, that of the states of bodies which
naturally possessed strong chemical affinities were
by means of the apparatus entirely reversed, the
consequence would be a division and destruction
of the compound, which they formed in consequence
of their Nat.l affinities. To prove which the
following experiment was performed.
Mercury and sulphat of Pot ash was placed on
the Galvanic circle and presently it was decompo-

Just ash appearing at the negative, and Sulph: and at the Positive pole — This effect is produced, according to Mr Davy by the action of the Gs oppositely evidencing a State of Elec[y] in the sulph: and the reverse of that which is natural to it, and the same in the positive Just ash; and consequently the two substances instead of combining, actually expel each other, and are found on opposite ends of the cupful in which they were placed in combination, the zinc at the positive, and the potash at the negative side

+ To this theory it may be objected that if the Electricity in both bodies be changed and the zinc 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 Sceptic.

— 1009 —

Thursday 5 Jan. at 2 o'clock Mr. Dond
Astronomy Lect 2. Investigation of the Nature of
the suns apparent annual orbit. Machine to il-
lustrate the Hypothesis of Ptolemy and the Ancient
Astronomers. Of the Rotation of the sun on its
axis; its magnitude and distance. Of the moon;
its Phases and motions.

— Instruments — Dr. of 10 inch Equatorial
German-Equatorial Instrument — Two rings
to represent the Equator and Ecliptic.
Meridian circle (common) fitted to represent the
Horizontal System — Earth in the Centre.
a rod with the sun on the Extremity of it, and an inclined plane in the
middle — Inclination of the Eq.r to the Ecliptic
Long. Sol.: Decl.n Right ascension — Precession
of the Equinoxes — Days and Nights.
Terrestrial Telescope, its construction
and use — five lenses in the Telescope.
Distance of a Star from the Zenith — Transit of
the pendulum in interval of the passage over
the meridian —

— Potassium in Carbonic acid gas decomposed it, pure pot ash and carbon were produced (this experiment failed at last lecture).

— Potassium and burned in Oxi: m: acid Gas.

Nitrogen Gas extinguished a taper.

— + Mr. Davy replied to the objection in the Philosophical Magazine, and shewed that the acid in the sulphat of pot ash is attracted by the positive pole, and the alkale by the negative pole of the battery, now supposing that the acid and alkale 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 are mixed and formed Atmospheric air, proved by a taper burning with the same light as in at. air. —

— supporters, as in Thomsons Theory of Combustion, not necessary Potassium burns in Carb: acid gas. which is not a supporter of Combustion. —

Royal Institution 1809

Saturday the 7th Jan.y at 2 o'clk M. Davy
Agencies of Oxygen as opposed to the
bodies in Nature. Combustion illustrated
by Electrical facts and Chemical Experiments
— Atmospheric Air — Importance of the
subject — Lost — heat — sound. Ancients supposed
it an element. some thought it was derived from
water. Discovery of the Air pump, preparation
and specific gravity of the air. Part only of the air
employed in breathing — discovered by
= 1/4 of the quantity, called Oxigen Gas.
Discovered by Dr. 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 Oxig.
— Methods of procuring oxigen Gas — Vermillion
Red Lead — Manganese — Nitre, and Decomposition
of Potash, this the purest.

— Experiments —

— Taper in a jar of Oxigen Gas
— Mixture of Oil of Vit. and Phosp. in a glass of water,
sulphuric acid through a tube — fire in water
— Iron burnt in Oxygen Gas
— Mixture of Oxi. m. of P. K and loaf sugar
a little Sulphuric acid from a glass tube — fire

Royal Institution Sat. 14 Jan.y 1809
M.r Davy's Fourth Lecture on Expl. Ch.a

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

— Atmospheric air long known to be
necessary to combustion — Oxygen Gas. —
— Inflam.e bodies — Sun, by the ancients, derived
from heaven themselves. Principle of
inflam.y — Candela Philosophica — Expt —
— Hydrogen Gas most inflam.e substance
when hydrogen gas is burnt in a flask
j.r air moisture — Expt — same when mixed
with oxigen. Expt — M.r Cavendish first shew
that water was the result of burning Oxe-
gen and Hydrogen Gases. — Water decompos.d
Expt. — Gun barrel bent — Carbon next in
flam.e — Combustible — Not a simple substance
contains Hydrogen — Expt — Diamond contains
a small quantity of Oxigen, hence its great
difficulty in burning) — Light and heavy
Hydrocarbonate Hydrogen Gas — Expt — Gaseous
oxid of Carbon — Expt. — Olefiant gas — Expt —
Potassium attracts oxigen from every other
substance. Most recent experiments on
Chemical Carbonic acid Gas with Potassium shew
it to be the most inflam.e substance known

Royal Institution 1809

12 Lect

Mr 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 Jasper pasted on board
exhibiting the phenomena of the moons mo-
tion and phases — Elliptical orbits of the Earth
and moon — Obliquity of the Earths orbit — length
of time till it becomes least — whole revolution —

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

— The Phlogistic system may with certain modifications be maintained. Mr. D. gave a specimen of the manner of reasoning in this way, which however is not so satisfactory as the Anti-phlogistic —

– Coal insoluble substance, – When burning the may be seen the Hydro-Carbonet of both sorts gaseous and of Carbon &c by the colour of the flame. In burning certain substances of the coal Round the smoke passes of without leaving fire-ball known experiment of throwing a piece of burning paper to set the coals on fire – Coal and about 200 years. was thought prejudicial to health – had more as it produces more of the Oxylegnous Acid –

Gas light – Expt. first tried by D. Clayton – afterwards by Mr Mendroby Soho – Manchester – Savings – On Partition Burning Depot to light the Whole town, as advantageous as the scheme for regulating the weather by Electricity Lately proposed. – Absorption of the consumption of all the coals in Britain unfounded – Strata of metal perpendicular and sloping in various directions The Strata of coals horizontal or nearly so. Calculation from 40 square Miles, consumption ¼ mile in 50 years. The whole in 8000.

Potash – Expt

– water decomposed by Elect.y – or Galv. The results found by Elect.y –

– Galvanic Battery laid on the floor – four troughs of 50 each, 4 inch plates. –

This Cutting fixed Charcoal on in the upper Potassium part of a Barometer tube. in vacuo

– All gaseous substances contain water. Expt. moisten the outside of a retort containing a Gas, with Ether this will appear moisture

Royal Institution Thursday 19th Jan.y 1809

4h Lecture on Astr. M. Nord

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

— Mr. D. did not attend this the lecture. —

Lecture Room

Saturday 21st Jan.y 5th Lect. on Chem.y Mr. Davy

Inflam.ble Substances continued. Formation of acids. Properties of acids. New Experiments on this subject. Views respecting acidity. Water essential to this property. —

— On 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 artificially in England from Pyrites, and at Paris mountain, in N. Wales it is sublimed from the copper ore. A retort shewn, in which the procession of Sulphur from Pyrites had been effected, Sulphur sublimed in the neck. — In burning Sulphur in some degree of acidity was produced on the objects with which the smoke came in contact instantaneously it tasted — Many attempts were made to undecompose the acid, but as being the sulphureous. At length it was found that Sulphur burned with fix'd air produced —

produced Sulphurous, and with a gentle 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 subtle combustible — consisting of Oxygen, Hydrogen, and an unknown base, probably an inflammable substance — Acids characterized by last — This not always the case. some acids have nothing sour in the taste

— 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. Vol. acid and test paper — Some water is necessary to this effect of acids — Since my 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. On his death, the sons set to work & it was turned the ground in turning up the soil again and again, they did not find the treasure, but they had raised better crops than their neighbours — Now the history and progress of the discovery, which is well known — Phosphorus made in a small glass retorts. The neck of the retort was broken to take out the Phosphorus. — Pressed, shavings, feathers, in hot water.

— Exp. Phos: to be burnt slowly it produces Phosphorous, if rapidly, Phosphoric acid.

— Exp. Phosphorus to be burned in Oxygen, both oxygen and Hydrogen ~~gas~~ as produced — This Experiment was performed in a small retort furnished with a Nose cork by which it was connected by a small air pump — The terms Exp. and results from Sulphur — Terms Sulphur and Phosphorus noted of binary Simple Substances as is commonly supposed, are

triple compounds, consisting of Oxygen, hidrogen and an unknown base, which, most probably, is inflam.ble. —

— Sulphuretted and Phosphuretted hidrogen gas prepared The Experiments on the latter are due, by Mr. D— to be the most curious and interesting in Chemistry. — Shewd several of the effects — The gas in making from Phosp.s and [illegible] in a small retort escaped in dense convolutions into the atmosphere. — Fire at top and bottom of a glass of water In Inspiring Phosphuretted Hydrogent gas, the retort should be full to prevent the inflammation in the retort. This is effectually done by filling the retort with ~~Oxy~~ Hydrogen gas. —

+ Mr Davy thinks that the luminous appearance of fish, rotten wood, will with the wisp and other ~~the~~ phenomena of the kind on all phosphorus. — and thinks the objection from the first appearing luminous in water may be obviated by supposing the phosphorus metter very much diffused in the body of the fish. —

Royal Institution — 1809

Thursday 26th Jan.y Astronomy 5 Lectures

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

— Phases of the moon illustrated by a ball one half black, the other white (similar to mine) only just on the fixed Lamp and moved by the hand — Motion in the Orbit irregular — Retarded in the 1st and 3d, and accelerated in the 2 and 4th quarters — Course — Tho' the axis 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.y 1809.

Last 6th Experimental Chemistry by Mr. Davy
Continuation of the subject of inflam.e bodies and their
compounds. Nitric acid — Compounds of Nitrogene;
experiments on their proportions. Decomposition of
fluoric acid. —

— Nitric acid — known — composed of Oxygene and Nitro-
gene — Nitrogene how made. Muscular fibre and
nitric acid in a small retort — or by burning phos-
phorus or any other very inflam.e substance in
close vessels filled with Atmospheric air —
— Properties of Nitrogene. Kills animals, hence it called
azotic, this not proper, for some other Gases are mor
Noxious. — Compound 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, in Wilkinson's water cistern, in
the usual manner. Properties of Nitrous oxide
Taper burns brighter than in Atmospheric air —
Effect when breathed, very extraordinary. Different
in different persons. Dr. Mitchel 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. Dr. Johnson it produces
violent effects Mr D. thinks the gas is not pure
— A bit of Sulphur burning feebly was extinguished
in Nitrous oxide, but when lighted burned more
brightly, on immersion into the gas, it burnt
with brilliance. — Capt — Nitrous Gas poured gently
into a phial holding a small quantity of Alcohol
a metal tube put thro' a common cork in the phial
lighted, 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 experiment — Fluor acid decomposed by potassium.

Process. A small bit of potassium was put into one of the retorts with a brass stopcock. This retort was first filled with hydrogen gas to expell all the atmospheric air. It was then exhausted by the small table air pump. The retorts were now filled with fluoric acid gas from a Jar with a stopcock on its top. The retort 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 fluoric acid gas consists of oxygen and a particular gas, the properties of which have not been examined. —

+ nitrous oxide with hydrogen gas in a tall tube inflamed by the discharge of an electrical phial —

Royal Institution 31st Jan.y 1809

Lecture 1st on Perspective - by Mr. Wood

Introduction. Nature of the picture. Definitions &c.

- Short history of perspective - Definition -
Picture. - Object - Definitions - angles, right
acute, obtuse - perpendiculars - parallel lines
Planes perpendicular, horizontal, Oblique - Picture
always on the perpendicular plane interposed be-
tween the eye and the object - Horizontal plane
passes 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. Mr Davy

Muriatic acid; its combinations – with water – with oxigene. New experiments on this subject. Decomposition of Boracic acid, and its re-composition.

History of muriatic acid. Glauber the first who understood this substance, and who first produced it by decomposing common salt by sulphuric acid – Homberg's salts. – This process is still the best. –

This acid is pure only in a state of gas. Water absorbs this gas very rapidly. It must therefore be procured over mercury – M. ac. Gas is capable of combining with oxygen in two proportions, oxygenized, and hyperoxygenized M.ic a. gas. Mode of preparing the latter – common process – applied to bleaching – M. first ingenious the cloth, this prevented by pouring it thro' some water – Injurious to the lungs of the workmen. Mr Davy recommended Ammonia to be used 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 Saline crystals of muriat of ammonia. The paper she makes has not that it answers the purpose – Muriatic acid gas rising under steam; but hyperoxygenized gas promotes combustion. Many inflammable substances take fire in this gas, even at the temperature of the Atmosphere – As this gas is very hurtful to the lungs, Mr Davy has contrived a respirator for living bodies in it. He puts the nostrils &c. of a horse into one of the small retorts which he has used in many

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

— Muriatic acid gas contains a great quantity of water perhaps a third of its weight — Mr D. has not been able to produce it free from water in its uncombined state, but by uniting this acid with Phosphorous and phosphoric acids, sulphuric acid and phosphorus, he obtained ~~fluid~~ compounds for more than monther. These compounds even ~~to~~ when fluid, though composed of matter supposed to be intensely acid do not act on Litmus or deprive alkalies, and are non conductors of Electricity; but a very small quantity of water destroys their energies, ~~makes~~ renders them conductors, and makes them capable of acting violently ~~acting~~ on Litmus paper and alkaline substances

— Exp! — Potassium detonates most violently with these compounds of muriatic 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 retort 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 shew that the muriatic acid has been decomposed.

— Boracic acid was decomposed in a manner similar to that of the former in Exp!

Royal Institution Tuesd. 7 Feb 1809

Lect. 2 Perspective Mr. Wood –

– Theory of vanishing lines and points

Recapitulation of Last Lecture

Royal Institution 9th Feb.y 1809.

Astronomy Lecture 6 — W. Pond

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 in 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 Ecliptic circle. The moon moves on an inclined circle round the earth in the center of the instrument both the earth and moon are very small — Remarks on the absurd constructions of the common Delineations of the Shapes — Calculations of eclipses very difficult — The same in the Ptolemaic as in the Copernican System — Ancients could not calculate eclipses — Accounts of their having done so to be received with great caution. Antiquity of the Chinese and Hindoo Astr.y doubtful — Bailie — History of the ancient methods for measuring the circumference of the earth, Eratosthenes &c and John Norwood the first English Man — His method the best Distance between London and York — It is not known who Norwood was — His name ranks high as a man of Science.

Saturday 11th Feb 1809. Royal Inst.

Experimental Chemistry Lect 8. H. Davy

Metals. Acidifiable metals. Experiments on their combustion and solution. Views 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 since the discovery of the new metals seems to be a characteristic property of metals, for Potassium a very light body: it is to water as 6 to 10. Inflam: a property of all metals. Experiments shewing the inflam: of Iron. Iron burnt in a furnace Copper on Charcoal with a stream of Oxigen gas. Iron wire fixed to a gazometer — Gold and Silver leaf burnt by the Galvanic Battery — 10 troughs, 25 plates each. Gold in square pannage in three rows of three cells each with one trough acids the end — Inf: of Potassium shewn by throwing it into water, flies for a few seconds it explodes with a small crack — Iron wire burnt in Oxigen gas — Metals soluble in acids, oxidizes, iron unites with the oxigen of the water, the Hydrogen escapes in Inflam: gas. — Metals precipitated various ways — Copper by iron Expt: 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 the metalic form Sol: alkali in an oxid of Gold, Lime water

fulminating silver taken in an oxide — fulminating Gold and Silver exploded on Iron over a Lamp — in an exhausted retort the fulminating Silver was also burnt — — process of refining Gold and Silver briefly explained Cupellation — Cupels shewn — History of the noble 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 Cloth, still made as Shabo described — many new metals lately discovered — last of all Potassium and Sodium by M. Davy —

+ The detonation of fulminating gold has been the Instrument of much deceit with the Alchymist 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 shews particles of the gold scattered about by this terrible amount.

— The idea of the Philosophers stone was absurd; that of the Occult alchymist was just otherwise — Every metal formed from a kind of seed, that of Gold requires a long time to be matured. This process may be assisted by art &c — The contrary to this cannot be proved — Should Gold be found to be a compound substance, from that moment the possibility of making Gold will be fully established — —

+ The ancient Romans were acquainted with Bismuth, Cosmetic — 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 in Britain — no occasion for it.

Royal Institution Sunday 11th Feb 1809

Perspective 3d Lecture — Mr Wood —

— Recapitulation of part of last Lecture

— Application of the principles of perspective to practice

Mode of Ruling down & putting a point on the picture — Representation of a square in different positions — Rooms in perspective shown. —

Astronomy Lecture 7th — Feb. 16th — 1809 — Mr Pond

Continuation of the former subject of the menuration 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. Cooke, a large Theodolite, Two circular Instruments, and the Bordas repeating circle. — The modern method of measuring an Arc of the Meridian — Troughton — Case of verification — French and English measurements — French instruments much inferior to the English &c &c

Royal Institution 10th Feb.y 1809

Experimental Chemistry Lect. 9th — M.r Davy

— Metallic substances continued. commencement of the investigations respecting the metals of the Alkalies. Potassium. —

Description of Alkalies bodies — Principal properties — fixed — volatile — Vegetable, mineral, this division improper — Method of preparing the Alkali Pot ash and Soda, pure. Former attempts to decompose the Alkalies — what induced M.r Davy to attempt the decomposition by Galvanism —

The Experiment shewn. 11 troughs of 25 pair coppers 6 inches square — conductors copper wires, with two short wires of platina hooked to the copper wires. The pot ash was decomposed in a minute or so. The pot ash was decomposed by heating a bit of potassium in a small retort filled with ~~oxygen~~ oxygen gas. It was shewn by test paper that it was pure pot ash — Pot ash and Soda articles of great importance in Manufactures — Bleaching — Glass making described — Pliny's account of the origin of Glass — Merchants, Natron Soda to rock their victuals — Liberius Glass cup with a handle cost 50,000 Lr.s pounds — Great utility of glass — Discoveries in astronomy, Chemistry &c. — The great demand for the Alkalies has given birth to different methods of decomposing sea salt to obtain the soda — two processes described — M. D — thanks Mr.

the new discoveries in the class of Alkaline bodies may probably lead to a more Economical mode of effecting this decomposition.

Tuesday 21st Feb. Perspective by Mr. Wood

The perspective of regular and irregular buildings &c &c

— Did not attend this lecture. ——

~~Did not attend Mr Wood on Monday last 20th~~

Royal Institution Thursday 23 Feb. Mr. Pond

Mr. Pond's Lect 9 — Continuation of the Subject relative to the figure of the Earth. Consequences arising from its Spheroidical form. Of the different methods of finding the Latitudes and Longitudes of Places on its surface. —

Short recapitulation of last Lecture — ~~Brief~~ Principal measurements to ascertain the magnitude & figure of the Earth — French Measurement by Picard and others. English Do. by Blackburn, connected with the French, carried to the Pyrenees and lately through Spain

Difference between the French and English Obs. as found by the French Measurements to be

1 9 21.4 in time, by the Eng.h 9, 19.5 — By D. Maskelyne Astr. observat.r 9, 20. probably the nearest to the truth

— From the result of all the determinations it is appears that the difference between the Polar and Equatorial axis is about 12 miles, and that the Sphaeroidism of the earth is not regular that is the meridians are not in any part of the same Ellipses. — Hence plain may be cast on part of a meridian of the earth, and yet under the same celestial meridian. — Several drawings made use of. One an Ellipse with two convex ends Equatorial check below the centre ⋮ the Ellipse described by the dotted string. — Another figure to illustrate the effect of gravity on the pendulums in different latitudes.

+ At last lecture in describing the measurements on the Andes, Mr. R informed us that an obelisk or Pyramid was erected at each end of the base with plates full of high encomiums on the King of Spain and French Academicians. The Spaniards thought the praises too limited for such deeds their nation, and have since destroyed the towns. + Earth now bound with a fillet, after Mr. Bouguer

— Methods of finding the latitudes — Gnomon — Altitude of the Sun or Star — Astronomical Quadrant — 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 explosions of Gunpowder or any other instantaneous phenomenon — By a Chr. 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 Chemical means. Sodium, its properties. General views connected with the decomposition of the fixed Alkalies — Nomenclature. Different modes of preparing it. Ancient methods of accounting for its appearance. Mr D thinks that in the process of preparing it, Potassium is produced. A compound of Potassium sulphur and produced a substance of the same kind as pyrophorus — Prepared a large quantity of Potassium by the French or chemical mode (see Davy's appl.n in his paper) Phil.l 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 against those persons who are perpetually asking what is the use of such discoveries. He acknowledged that such questions produced at first some irritation but he now &c &c. — Suppose a person should ask what is the use of painting, Statuary &c &c, He would be considered as a Goth and Barbarian. — Mr W.D. did not mean to elevate experimental Philosophy to the level of the fine arts. — Its great utility to society. Even the late discoveries already seem to point to improvements in some Manufactures &c. — Sciences of Bacon & Newton —

Tuesday 28th Perspective Lecture 5 Mr Wood.

Perspective of Objects upon or inclined planes. Applications of the rules &c &c. — Did not attend this Lecture

1809

Royal Institution Thursday 2 March

Lecture 9 Astronomy - Mr. Pond -

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 - Constants of the Stars regular - planets not. prop. the Ancients supposed the planets to lose part of their light when they become Stationary, for in the midst between the two Stationary points the planet was brightest. This is certainly the case for the planet is nearer to the sun. Figures of the orbits of the inferior planets Mercury and Venus, Copied - how described by the planetarium on Jupiter - 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 R.n - Observations on the superior planets Mars Jupiter - Saturn and the Georgium. 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 flatted 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 Herschell -
- Calculations of the figure of a planet from its velocity on its axis - two answers - This illustrated by Algebra Quadratic Equ.n - here one Equ.n equ.s absurd or impossible - Saturn however both are possible - as in Mercuries orbit. Earth -

Royal Institution Saturday 4 March 1809

Lect: 11th Experimental Chemistry — Decomposition of the Earths. Metals of the Earths.

The Decomposition of the Alkalies & Earths requires a greater Galvanic power than the Alkalies — Battery of 20 Troughs each 25 Inches employed

Now the Alkalies & Earths enumerated —

— Barytes decomposed — metal — several experiments with

— Strontites — Magnesia, decomposed

+ These new discoveries promise many improvements in Arts and Manufactures — Potassium will probably be employed to produce decompositions of great use in the Arts and Manufactures. Many phenomena of Nature more satisfactorily explained — Volcanos. Dr. Hutchyns from the general mean gravity of the Earth more than the gravity at the surface. Hence it is probable that the interior parts consist of metallic substances. When through clefts and fissures air and water have access to them, inflammation takes place, hence lava and all the products of an eruption — Meteoric Stones may enter our Atmosphere in a Metallic State, they will by the oxygen of the Atmosphere become inflamed — earths. — The phenomena attending the Stones that fell in North America described —

Royal Institution. Tuesday 7th March 1809.

Perspective. Lect 6th – Mr Wood.

The ground arch. General application of the law of Elevation. Steps in different positions &c &c.

Astronomy Lect: 9th 10th Mr Pond. –

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

– Five new planets – Georgium discovered by Dr Herschel in 1780 – 6 Sat^s – Their orbits perpendicular to that of the primary planet!! Period – Distance from the Sun. &c – Ceres discovered by Piazzi in 1801. Orbit between that of Mars and Jupiter. Analogy supposed a planet in that space, not from any demonstration 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 Astron^r. Pallas is at the same distance from the Sun as Ceres and they describe nearly the same orbit Their nodes are the same, the excentricities 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 depend on the progress 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 falling from the heavens, have been mentioned by many writers of antiquity, believed by them tho' but rejected as vulgar errors, by Philosophers. The instances that have happened lately have put the matter beyond dispute — ~~Mr D~~ Mr P thinks they have fallen from some of those exploded bodies — Comets — Ancient opinions respecting them — Meteors — Kepler thought they move in straight lines through our Systems and never return. Newton on the contrary thinks they move in curves round the sun, Parabola, Hyperbola if in them they never return. Ellipses very uncertain — Mr D thinks the comets cannot all belong to our Systems 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 Inst.n 11th March Mr Davy
Exp.l Chemistry Lect. 12th — Metallization of
Ammonia. Experiments on Amm.a New
views concerning its Elementary Matter. Decom-
position of Nitrogene. General ideas flowing from
the new facts. — Conclusion of this course.

History of Amm.a — Scheele and Priestley's Discoveries. pure Ammoniacal Gas. — Decomposition of amm.a often attempted. History of these attempts last by Berthollet — Results. Amm.a is composed of Nitrogen and Hydrogen — Objections to this. — Mr Davy finds Oxygen in Amm.a and a Metallic Base — Several Experiments on Ammonia — Potassium used — Three different modes of attempting the decomposition of Amm.a all Positive in the Results. Mr Davy decomposed Amm.a by Potassium. Recomposed. — Used the same kind of small vessels 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 was the dream of Newton — Concluded the Course.