Askesian Society

Contributors

Askesian Society

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Experimental Committee

of the

Askesian Society

Sessions

1801—2

Committee

Wm. H. Pepys

Wm. Allen

Sam.l Woods

a — distinct

single ——— sharp

c — with a double bough very sharp —

1 one bough filled with muriat of ammonia

2 ——— with that of ——— do.

No 1 appears to be the strongest —

circuit of 8 — intensity diminishes as the No. —

b — very sensible — effect increased by a piece of moist pasteboard between the cups —

d — very distinct from a point & a flat surface —

deflagration of gold leaf & of gunpowder effected —

f — effect upon the galvanometer in diverging the gold leaf very sensible — striking distance according to the register exactly 1/2 inch —

Askesian Meeting – 3d Novr. 1801 –

Galvanism
first noticed by Galvani at Bologna abt 10 yrs ago –
when dissecting a frog observing the strong contraction
of the nerves when a spark was drawn from the conductor
of an electrical machine
this contraction produced by zinc & silver

a plate of zinc on the upper surface of the tongue
a Silver — under
on contact a sensation resembling taste – subacid
accomp^d by a slight shock & sensation of a flash of light

b water in a tin or zinc cup placed on a silver support
if the tongue be applied to the water it is quite insipid
but if the hand well moistened holds the silver support
a distinct taste is perceptible – the diff^t taste of water
a porter in a glass & pewter pot owing to the galvanic
influence –
pile of Volta – galvanic trough –

c shock resembles that of a Leyden Phial feebly charged –
does not penetrate the skin unless each hand be well
wetted & a piece of metal grasped in each
not instantaneous – tremulous & cont^d sensation

d galvanic spark – fine pointed iron wire – knob
both extremities of the conductors armed with
gold leaf

e — flash at the extremity of the silver wire
(or that which is immersed in water & disengages
hydrogen) – the oxygen or zinc wire exhibits only
a faint luminous point –

f plus & minus – condenser & electrometer –

a — with great success — production of gas & of acid of silver very rapid & distinct

d* — Syp. violets blue — } Zinc wire — ~~blackened with pink col~~
Silver wire — green cloud & green line ascending —

f — repeated with success — metallic needles formed on the silver wire —

h — ~~metallic bands on the~~ bubbles of air on the Zinc wire
silver wire with a white crust —

Shock — very sensible thro 13 persons —

17 Nov.r 1801

At our last meeting we shewed the mechanical operation of galvanism — we shall this evening display its effects as a chemical agent in the decomp.n of water, of acid tinctures & on the solution of metals —

a decomp.n of wat.r — fine stream of gas from the lower wire in very minute bubbles (i.e. comm.g with the silver end of the trough) — this wire will remain clean & bright — from the upper (or zinc) wire no gas but oxidates rapidly the oxyd gradually subsides in the form of very fine cloud water diminished in quantity — gas ex.d hydrogen — tube inverted — vice versa —

b — use two unoxydable wires — gas issues from each & the water diminished — mixture of hydr. & oxy. — explodes —

c — ex.d more accurately by M.r Cruikshank ½ in tube out of water — result — hydrogen 2 — oxygen 1. — as ex.d to the ascert.d proportion

d — tinct. litmus with gold wires — gas as before — zinc wire at bottom — fine red line extending upwards & shortly the whole fluid near the point of this wire becomes red — the fluid at the silver wire deeper blue

e — tinct. brazil wood — silver wire — purple — very dusky
Zinc wire — very pale almost colorless

nitrous acid ex.d from the zinc wire — oxygen of the water & azote of common air had by wat.r

alkali ? ammonia ex.d from silver wire — hydrogen — azote —

f — well known that hydrogen in its nascent state reduces the acids of metals — tube filled with a solution of acetite of lead in distilled water, no gas, but beautiful metallic needles on the extremity of the silver wire — the lead thus separated completely metallic & brilliant

g — solution of sulphat of copper — copper precip.d in the form of a button —

17 Novr. 1801—

h— Solution of nitrat of silver — beautiful metallic brush in the form of needle like crystals

all fluids not containing oxygen as alcohol, ether, fat &c incapable of transmitting the galvanic fluid

pure ammoniac with silver wire nearly the same effects

i— dilute solution of nitrat of silver — pure ammoniac — rapid production of gas from the silver wire — grayish flakes evidently metallic Silver separates from the silver wire — dr. grey powder from zinc wire after some hours a considerable quantity of metallic Silver deposited & the zinc wire encrusted by a blueish black substance — on endeavouring to remove this crust with the finger part exploded tho' still moist — wire corroded & full of holes — next morning this powder touched with a knife exploded loudly — fulm. silver of Berthollet

k pure ammonia — platina wires — gas rapidly prod.d at both wires — hydr. & azot. — = as in ammonia

concentrated nitrous acid — most powerful chemical

Mr. Cruikshank's theory —

capable of existing in two states — oxygenated & deoxygen.d passing from the silver wire into a fluid leaves it oxygen & passing from the fluid into the zinc wire parts with it again —

c & d — unsuccessful — according to the report of Mr Phys-

f — very distinct

b — plainly perceptible —

e — the effect of this experiment is clear & striking

b — the attempt to charge a Leyden Phial
succeeded very imperfectly — by forming
the circuit with the tongue a sharp prick is
perceptible —

Dec. 1 1801 Galvanism

a at what distance the communicating wires will decompose water

b charge a leydenphiae

c deflagration of wire in oxygen gas

d fire oxygen & hydrogen

e Solution of copper — Silver & iron in contact — + copper precip^{d} on the Silver

f Solution of tinfoil & gold in dilated nitr. acid

g decomposition of Sulphuric acid —

h indication of the positive & negative State of the galvanic fluid by the galvanometer

V. its effect in disturbing the polarity of the Magnetic needle

Bennets electrometer — glass bwan
evaporation —

elect. aura —

amalgam — Zinc Amercury — oxydable.

glass stool

Dec 15 — 1801 — Electricity

Two fluids or modifications

vitreous — produced by the friction of glass, hair wool & other similar substances — supposed to be redundant & called positive or plus

resinous — produced by the friction of amber, gum silk &c. supposed to be deficient & called negative or minus

they repel themselves, & attract each other accumulation of either fluid —

Leyden Phial — Cunæus ab. 1745 —

Construction of the machine — Ingenious

Charge — Shock —

~~a paper pasted on wire~~

Analysis of the Leyden Phial

The whole operation of charging consists in conveying the fluid from one side of the glass to the other & the quantity of electricity is the same after charging as before

b — insulate an uncharged phial — it will not charge

c — make a communication by which the fluid may escape & the phial may be charged

d — by means of pith balls shew that the inside is positive (repels) the outside negative (attracts)

e — glass not previous — to restore the equilibrium the inside & outside must necessarily be joined by some conducting substance

f — bring the knob communicating with the inside ab. 2 in. distant from wire communicating with the outside — suspend a pith ball between them — alternate attraction — vial discharged —

to prove that one side loses as much as the other gains —

g — hang a fine linen thread near the outside — bring the finger near the inside wire — the outside supplies itself from the thread —

h — insulate the rubber — no charge from a communication between the outside coating & the ins.d rubber — charged with ease

i — insulate the phial —

deferred — in this case it is plain the same fire which existed on the outside is conveyed by the wire to the rubber, from thence to the electric, the conductor & the inside of the phial —

this led to the construction of a battery — which by connecting the inside of one with the outside of another & thus transferring the fluid in many phials with the same facility as one —

~~power of accumulation — not in the coating proved — by coming the coating~~

k — ~~panes of glass~~ —

a — satisfactory —

b — distinct but not luminous

d — no rapid motion — fibres much distended

e — Ostrich feather — head of hair

f — cotton — silk —

c — bells — Spider requires very small portion of electricity — figures —

January 12 1802

a feather / leaf gold } driven about by an excited glass tube
attracted by excited sealing wax

b luminous shower of brass dust produced by discharge of fire
to the prime conductor between two metal plates
in a glass tube —

c Elect. bells
& figures
& spider

d motion of a fine downy feather

e extension of the fibres of a large plumy feather

f bundles of thread, hair, silk & cotton

~~g long sparks~~

Jan. 26 1802

Nairnes large Machine—
two Jars—charged without communication
with the earth
Several luminous experiments—
discharge of a small cannon—

above. Babington

Feb. 9 — 1802

Revolution of glass balls
and pointed wires —
Charge of the Leyden Jar — principles —
Haldanes method of charging a balloon
Lawsons electrometer —

Mar 11 — 1802

We propose this evening to exhibit to the Society the different states of the two coatings in a Leyden phial in the act of charging —

For some time after the pleas dominus theory had been generally adopted, the outside & inside of a phial while charging were confidently deemed to be in ~~different~~ opposite states. i. e — one neg & one pos.

M^r Brooks an ingenious electrician at Norwich claims the discovery that this was not the case & it was some time before M^r Ferguson, Bewly & others were convinced it was not so —

one circumstance however has escaped his attention & to it appears both curious & important — which is that when the jar is insulated & charged whether pos or neg: by means of a pointed wire in contact with the outside, a pair of cork balls communicating with the inside & another with the outside will both be elect^d pos or neg — & the upper pair will in both cases be repelled by the outer coating, but if the jar be not ins^d — the pair connected with the inside will in both cases be attracted by the outer coating — hence the two sides of an ins^d jar appear while charging to be in the same state — but the two sides of a jar not ins^d while charging in opposite states —

Committee - 1802 3

Wm. Allen

R. Phillips

Sam. Woods -

Nov. 4 — 1802

We propose to shew this evening the expansible property of caloric & we mean to pursue this subject for some succeeding sittings intending at the next opportunities to illustrate the repangible reflecting properties of caloric —

W. Allen's instrum.

Expansion of metals by Jones instrument

brass bar

Therm. 60 — 1 min. 110 ~~[illegible]~~

one revolution $\frac{1}{50}$ inch —

Therm. 170 — 1/2 min — 1 revolution

0 — 212 — 3 min — $\frac{125}{200}$ = total $\frac{325}{200}$ —

of the index — = $\frac{1}{50} + \frac{1}{100} + \frac{1}{400} = \frac{13}{400}$ of an inch

copper

Therm 75° — 2¼ min — 1 revolution —

212 ——— 2 revolutions —

lead — 212 ———

Nov. 18. 1802

At our last meeting we endeavoured to elucidate the expansible property of calorie: our present object is to illustrate or rather to prove the existence of another property, we mean its radiant emanations -

The analogy between light & heat so conspicuous in many instances & so different in others might lead to the supposition tho' not to the presumption, that heat as well as light was subject to catoptric laws & might be reflected from the surfaces of bodies - a strong light may be produced independently of heat for example by rays of the moon collected at the focus of a concave mirror & no reason à priori can be assigned why invisible heat may not diverge from a heated body in radiating emanations - pursuing this idea Mr Pictet contrived a series of experiments similar to those we are now about to offer to your examination -

We place two concave mirrors of tinned copper well polished & 30 inches in diam^{r} precisely parallel to each other at the distance of six feet - having first ascertained the focus of reflected light pursuant to the general laws of reflection - having provided an air

thermometer, which has the advantage over a
mercurial one, of much greater sensibility -
in the focus of one these Specula we place
this Thermometer & ~~interposing a screen~~ we
place an iron bullet heated not sufficiently
to be luminous in the focus of the other -
the apparatus being thus disposed ~~I too~~
~~caution sensible in the thermometer we shall remove~~
~~the screen~~ & you will immediately perceive
a considerable rise in the Thermometer which
as the bullet cools will gradually subside -
from the abovementioned position of the
mirrors it is evident that any radiant
reflexible emanations excited at the focus
of one mirror, will be sent back, in part, as
a bundle of parallel rays from the surface
of that mirror upon the opposite mirror
& again by a second reflection collected
at the focus of the last in a degree of density
not otherwise attainable -
In order to obviate any objection arising from
the uncertainty whether the bullet tho' perfectly
dark to our eyes might not emit light dis-
-cernible by organs more accurate than ours

we shall now exhibit the action of a flask of
boiling water placed in the same circumstances
& you will perceive that the effects are precisely
similar —
we shall next evince the existence of this
condensation of calorific rays by its action
on inflammable substances — we place
a piece of phosphorus in the place of the
thermometer & you will perceive it to be
ignited —
in the next experiment we shall have recourse
to an agent somewhat more powerful:
a small brasier of ignited charcoal will be
substituted for the iron shot & in the opposite
focus we shall place a few grains of gun-
powder which will be found to explode
~~by the effect of the rays~~
~~[illegible]~~
these experiments we conceive will be sufficient
to satisfy the society respecting the existence
of radiating calorific emanations —

The attempt this evening did not succeed well-

qu. if this does not refer to the Expts of the next Meeting? —

Dec^{r} 2. 1802

At our last meeting we offered such experiments as we deemed conclusive proofs that caloric is emitted from bodies in the form of radiant emanations: M^{r} Berthollet in a conversation with M^{r} Pictet suggested whether cold was susceptible of reflection? M^{r} Pictet confidently replied no; that cold was merely the privation of heat & that a negative could not be reflected — they however determined to try & the result of that trial we mean to repeat upon the present occasion: we shall dispose the apparatus as before; placing at one focus an air therm^{r} at the other a freezing mixture which will very sensibly affect the therm^{r} —:

before we proceed to investigate the cause of this phenomenon it will be proper to satisfy the Society of the reality of the fact after which we shall offer what appears to us to be the true solution —

We must recollect that heat & cold are terms merely relative & that in the instance before us the therm^{r} having the temp^{e} of the room must with regard to the freezing mixture be considered a heated body: if these bodies be placed contiguous, the general law of diffusion to preserve an equable temperature, will produce a current of caloric from the warmer to the colder body & indeed from all warmer bodies to the

one cooles body till the latter has obtain'd a suffic^t supply of calorie to restore the equilibrium — the influence of the freezing mixture therefore is to solicit a supply from all bodies in its vicinity towards & chiefly from that side exposed to the cold body: this is its direct action to which the therm^r. is exposed in common with other bodies:

let us now consider the effect of the disposition before us; the freezing mixture solicits a large supply of calorie is placed in the focus of a mirror, which mirror for the sake of illustration we may imagine to consist of 1000 diff^t points, from each of which a caloriferic ray emanates to the focus — these 1000 points being opposite to 1000 other points disposed also to emanate rays & to supply them in parallel lines: demand this supply from a common point viz the focus where the therm^r. is situate: of course afford the utmost facility to the calorie in the therm^r. to pass off in a multitude of channels all centering in the same point viz the focus where the freezing mixture is placed & where the calorie is rapidly absorbed — it is evident that this disposition is admirably adapted to the abstraction & transmission of calorie from the therm^r. & will be conceive not only account for the fact but corroborate the evidence before adduced of the existence of radiant caloriferic emanations.

Dec. 7 1803

Expt. on the mutual decomposition of nitric acid & alcohol mixed in a retort, ~~over~~ with the spirit lamp & the decomp. of sulphuric acid by the operation of the gases produced.

2 ounces Nitric Acid Sp. Grav. about 1,37 put into a pint Retort the Receiver adapted to which had a Pipe annexed for giving thro' Snow and Water to return into it such part of Liquid product as might escape through it. — A Continuation of said pipe carried the Gaseous products thro' two Bottles cont.g 1 common Water 2 Lime Water into the Jars of a Pneumatic Cistern.

A small Tube being introduced thro' the Tubulure of the Retort and the Nitric Acid gently heated a few grains of Alcohol were poured into the Tube and by successively stopping the end the effervescence in the Tube forced its contents into the Acid Successive portions were thus thrown in to the Amount of

about One Ounce, each addition causing a strong effervescence and passage of Gases: at last the Liquor in the Retort boiled quietly by the Spirit Lamp. & the extrication of Gases nearly ceased.

In the Retort was left a small Quantity of Acidulous Water impregnated with the Gases.

In the Receiver about 3vi of an inflammable Liquor cont^{g} a little Nitric acid and in which the smell of Acetous Ether predominates

Bottle No 1. Acidulous and highly charged with Gases.

Bott. No 2. A plentiful Separation of Carbonate of Lime

In the Pneumatic Cistern a Mixture of Gases among which were detected Nitrous Gas, Gaseous Oxide of Carbon and Carbonic Acid Gas. By Nitrous Oxyd?

Dec. 22 1803.

March 15 1806

abt. 3 in. 19:

2 Troughs of each 36 Plates of Copper & Zinc were charged with a Solution of Dilute Nitric acid 1 to 16 Water — To the one a Small agate cup containing distilled water was added — to the other a Glass Vessel with dis Water — Platina Wires as conductors ——

10 Gallons used — 5 lb. by weight of nitric acid

16 2 Charges —
18 2 Charges
19 2 Charges
20 2 Charges

Upon examining the state of the experiments
this 20th. day of March
they seem to appear to be as follows —
the portion of water in the agate cup in quantity
abt. ℥j was divided into two parts, one of which
was subjected to the action of nitrat of Silver
and a slight but evident opalescence was
produced: but it is to be observed that the process
was not carried on in a close vessel —
the water in the glass vessel abt. ℥ij was in like
manner divided & exposed to the same test but
without the least apparent effect — the process
in the latter case was less exposed to the action
of the atmosphere —

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at the next night of meeting
the expt. of decomposition by galvanism, with
respect to the agate to be repeated —

the combustion of the diamond by means
of Galvanism — Mr Pepys & Mr. Allen

June 3 1806

Expt. — combustion of the diamond by means of Galvanism in oxygen gas, with a powerful Troughs — unsuccessful →

on repeating the expt. of the decomposition of water in the agate cup more carefully guarding it from any access of atmospherical air the platina wires connected with ~~both~~ ends of the trough were materially changed — but the water exposed to the galvanic action subjected to the test of nitrat of silver exhibited no sort of alteration — ~~but~~ the platina wires connected with the copper ends of the Trough appeared rough — the first of a blackish, the second of a yellowish colour →

Experiments proposed

Purity of distilled water

Athenian & Mineralogical Society

At the last meeting Jan 22 some of the late Galvanic Discoveries of Mr Davy were repeated — the Author had the kindness to lend some of the apparatus he made use of ——

Two Blocks of Sulphat of Lime or Gypsum having an excavation in each were filled with Pure Distilled Water — Two Platina Wires connected with the Negative and Positive Poles of a Galvanic Trough were then Introduced into the Water and a communication by means of a Piece of Asbestos was made between the Two Blocks of Gypsum — Gas was observed to be immediately

given off from each of the Wires.
in five minutes a Piece of Litmus Paper being introduced into the Positive Side was changed (owing an acid present) Red &c. The Paper thus changed being put into the Negative side regained its colour —

Turmeric Paper was then introduced into the Negative side and the colour was changed Red to Brown owing the presence of an Alkali The changed Paper being put into the Positive Side regained its colour —

In this Experiment Mr Lavy finds a compleat decomposition of the Sulphat of Lime takes Place Sulphuric acid is found

in the Positive excavation and a Strong solution of Lime in the Negative ——

Two Cones or Cups of pure Gold were then filled with a concentrated Strong solution of Nitrat of Ammonia The communications having been previously made — The ammonia was not only driven to the Negative Cup but in its passage being volatile steamed off in visible fumes — Nitric acid was found in the Positive Cone ——

The Society agreed to continue these Experiments to the next meeting ——

Two Blocks of gypsum the
one containing Tincture of Litmus
the other Tincture of
Brasil Wood — The
Positive wire reddened the
Tincture of Litmus The
Negative turned the
Brasil wood ———

When removing them the
Tinctures took their Original
colours

At the last meeting the
experiments of Mr Davy
which he terms conveyancing
were tried — Three Vessels
are containing Muriat of Soda
one Nitrat of Silver and one
Distilled Water were placed
arranged with Syphons com-
municating with each, great
care being taken that the
distilled Water should have
the highest level —
The Positive or Zinc Wire
was then introduced into the
Water and the Negative
Wire into the Muriat of
Soda — no action took
place while the glass

oxyhons were used — upon introducing pieces of asbestos immediately gas was liberated from the Wires and soon after the distilled Water became acid without changing the the Nitrat of silver in the Middle vessel — Some Nitrat of Silver was then dropped into the distilled Water at the Positive pole, a Slight Opalacity was perceived but from the acid state of the fluid a greater change might have been expected — W H P was requested to continue the experiment some hours previous to the next meeting

On the last L

On the last Evening of meeting the conveyancing experiment of Mr Davy was continued The three vessels were filled — One half of silver Muriat of Soda and Distilled Water — That the syphons of communication might not touch each other in the middle vessel, — Arches of Platina Wire was inserted in the Asbestos, and secured at each end, — that the bending of the wire might form the communicating arch, — The apparatus being filled, — gasses was obs

erved to arise, from each ends
of the arc's of communication,
the Nitrat of silver became
of a Dark Brown colour, and
as it subsided, liberated Gas,
the distilled Water became
acid, but produced a very
Slight degree of Opalacety,
or drop[illegible]ney in Nitrat of
Silver.

Several members having
expressed a desire, that the Experiment
of the combustion of the gas, from
Pit coal should be made. —
2000 grains of coal in small
pieces, was introduced into a
cylindrical Tube of Iron, connected
with a Tin vessel, containing
Water, so that the gas, should
be obliged to pass through
the water, previous to its entering
the Smaller tubes, for combustion.
It required above ten times
the weight of Coal, for the —
complete carbonization of the coal

in the Cylinders, — gas was plentifully liberated, and ~~gelages~~ of several kinds were tried, the Experiments were continued nearly ½ an Hours. — It was proposed at the next meeting, to repeat the Experiments, and by a Glass, to endeavours to destroy the Smoke, given of with the Flame.;

1808

Jan 14 & 28 —

The Experiments of Mr Davy were repeated on a Large Galvanic Apparatus of Mr Pepys's consisting of 120 Plates Copper & Zinc 36 Inches Square ——

Potash was decomposed and the Metaloid procured was thrown on Pomeric Paper moistened — a deflagration instantly took place and the Paper was marked with the Crimson stain of the Alkali formed ——

Soda was also decomposed and the Globule procured was found not quite so inflamable as that from Potash — The Paper moistened was stained in a similar manner as the last proving the decomposition of the Alkali

The chief difficulty in these Experiments are the seperation of the Alkaloid from the Alkali in which it is imbedded — It was previously recommended to the members to

consider the best method of
operation — the one proposed
by the author being defective

Communications to Boat
purpose it was stated would
be thankfully received and
noticed at the next meeting

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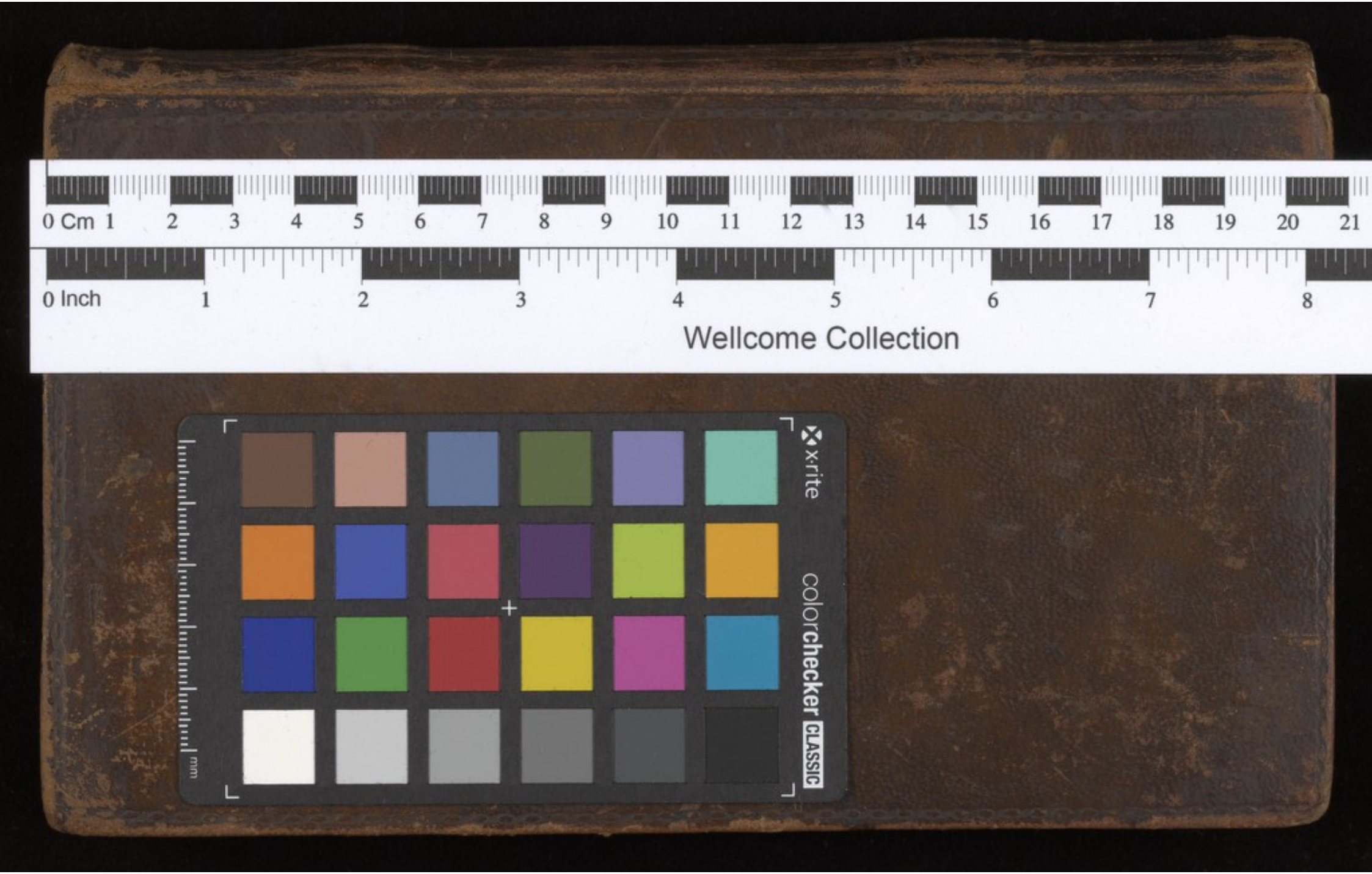
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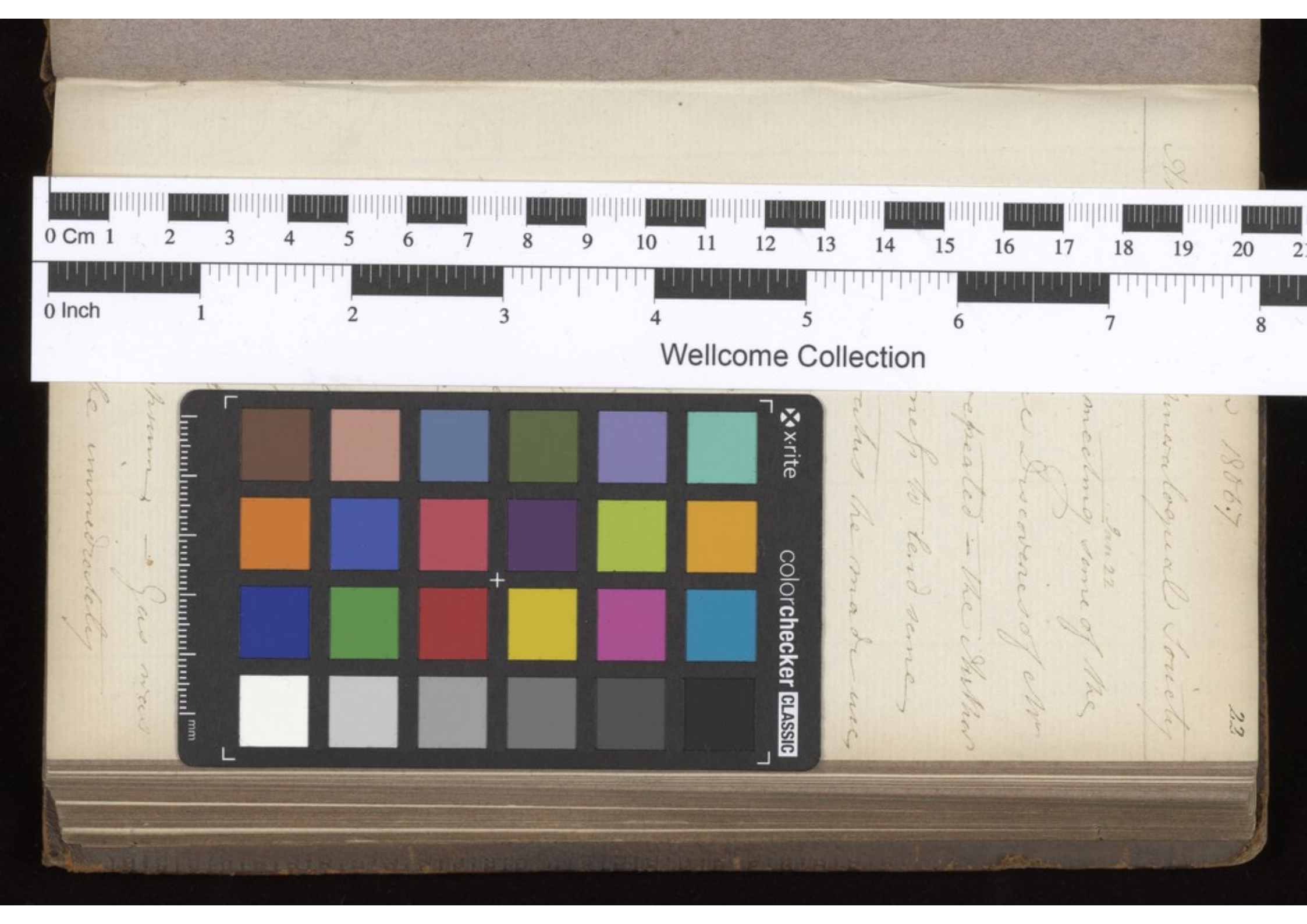
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