

Galvanic Experiments

## Galvanic Experiments.

X Frog - prepared - Exp. 4 -

1. <sup>st</sup> with the ~~Electric~~ <sup>Electric</sup> in action.  
X The frog laid on a plate  
The arm. nerve touched with  
the thumb, and the muscle with  
any metal -
2. The arm. on a plate of  
zinc and the muscle on a  
plate of silver. Connect the  
plates with any metal -
3. Hold the prepared frog by  
one leg, form a common circuit  
between the other leg and the arm.  
The hanging leg will sometimes  
stretch up the hand of experim<sup>er</sup> who



4. Place two wine glasses full of water near but not touching each other. Put the lower extremity in one glass, and the nerves in the other. Form a cord between the two vessels with silver. Or put the fingers of one hand into the water of the Munich glass, and with a piece of <sup>silver</sup> in the other hand touch the same nerves - violent convulsions - sometimes jump out of the glass

5. Lay a live flounder <sup>flat</sup> on a pewter plate, or on tin foil and a plate of silver on the upper side, a paper will answer. Connect the upper and lower by any metal evident signs of being affected

6. Put a piece of zinc on the upper side of the tongue and silver on the lower side, a peculiar sensation - zinc acid - silver - Alcohol -

7. Or put the zinc betw. the upper lip and the gum, and the silver on the tongue - Flash of light - Different sensations

8. + Water out of a pewter mug different from a glass

9. + Zinc in water not oxidized add silver - soon

10. + Iron ~~plate~~ <sup>nails</sup> Copper sheeting

11. + Ancient coins if of one metal - long preserved - compound, oxidized



12 + Silver spoons - known &  
put together - latter rusted

13. + Mercury kept long time -  
amalgam soon formed

14 + One tin long bright - rusted  
soon formed

15 + Pure gold and silver exposed  
to the atmosphere soon oxidized  
- with copper iron tarnishes

~~16~~ Voltaic pile - Described

16 - Shock - several ways

17. Flash of light - Chests

18. Two piles - 2 made of connected  
top and bottom.

19. Animals living and dead  
submitted to Galvanism.

20. Water decomposed - 3 Expts

- #
1. Single tube -
  2. tube and cup
  3. Syphon tube -

21 If an iron wire be connected  
with the zinc pole, only  
Hydrogen gas will be produced

22 With a rotation of air -  
tile of lead in distilled  
water no hydrogen gas is  
produced - lead reduced to lead

23 - Sulphate of Copper - metallic  
button - adheres to the wire -



24. Nitrate of Silver forms  
the Arbor Dianna

25. Tincture of Silver in Dist.  
Water - Gold wire - A fine  
red line rises from the Zinc  
wire - soon the whole fluid  
near this wire becomes red.  
The fluid about the Silver wire  
looked soon of a deeper blue  
than before, the slight tinge  
of purple being destroyed.

26. If the glass tube be filled &  
filled with distilled water  
tinged with tincture of Morax's  
wood, the fluid around the Silver  
wire, particularly its extremity,

becomes purple, and afterwards as  
deep as can be produced by  
Am<sup>a</sup>, while the fluid about the  
Zinc pole even ~~was~~, becomes al-  
most colourless.

N.B. These two experiments show  
that an acid (nitrous) is formed  
produced at the Zinc wire, and  
an alkali (ammonia) at the  
Silver wire.

27. To a dilute solution of Silver  
add from Ammonia till the  
mixture stands strongly of the latter  
- If the tube Silver wire - much  
gas from the Silver wire. Little or  
more from the Zinc - after some time  
grayish white flakes (metallic Silver)  
by the Silver pole, and a dark gray



Plaster at the joints were — After  
some hours the a considerable  
quantity of Muscular Salts were  
<sup>deposited</sup> ~~formed~~ and the joints were  
was covered with a black black  
substance, in examining this with  
the finger it exploded the shell  
burst and the tubes were later covered  
covered full of holes. When dry and  
touched with a Knife it exploded  
with violence (forming white Salts)

28. The last Experiment may  
be performed with pure Am<sup>o</sup>  
instead of the Nitrate of Silver,  
and with the same success —

29. The last experiment with pla-  
ster was a great <sup>quantity</sup> of gas was

produced from both wires, which  
is a mixture of Hydrogen & and  
Nitrogen gas in the ratio of Am<sup>o</sup> —

30. Plates of Silver and Zinc  
of 1.2 inch square and 10 in  
number — with concentrated Nitro-  
acid gave a shock which number  
the fingers — A trough was used

31. Hold a prepared frog by  
one leg and bring within the  
other on the armour to one end  
of a pile without completing  
the work, the frog is violently  
agitated, but soon after loses its  
irritability —



Defflagrate -

32. Join a small iron wire to the negative conductor and bring in into contact with the positive end of the battery - will be Defflagrated

33. Connect one conductor with a vessel of containing clean mercury - bring the small wire into contact with the surface of the mercury - Defflag?

33. Attach ~~to~~ one of the conductors with charcoal, to which apply the wire to be melted - Defflag?

34. Lead lead on charcoal - Defflag?

35. Steel wire fixed to the zinc pole and brought into contact with the copper cup pole, better sparks  $1\frac{1}{2}$  inch in length, in the form of a cone shot out incessantly - sparks sometimes pronounced and appeared tipped with silver. They were all red, but the point of contact was black, and of the size of a pin head, and the whole outline was distinctly visible in day light - It seemed to make no difference whether the wire was held in the hand, or by an insulated handle - (22 wires @ 1 inch square size - Berlin -

N.B. The snaps accompanying the sparks were heard through the room - in open air - were heard to the fields -



36. The Different metals ~~are~~ in  
leaves or fine wire burnt —  
— May be stuck on <sup>the</sup> ~~one~~ ball of  
one conductor and brought to  
the mercury in contact with the  
other conductor — or with charcoal  
— Fine leaf burn with the great  
brightness, throwing out red rays  
of more than six inches in length  
— All these more brilliant  
in Oxygen gas. —

37. Zinc powder — Hydrogen gas —  
Powders, pulverizing Mercury, lead  
on charcoal, all fired <sup>in</sup> <sup>the</sup> <sup>gas</sup>  
<sub>200</sub> white  
Mr. Day —

38. In many experiments it  
is best to let one of the con-  
ductors terminate in a vessel  
of water — when both conductors  
are thus disposed and the hand  
plunged into the two Glasses  
the shock is different from that  
taken in the common way —

39. Raise the Epidermis, and apply  
one or two series — sufficiently  
strong for some moderate pur-  
poses.

40. The galvanic shock is stronger  
when the person who receives it  
is insulated.

41. The battery is also more powerful  
when insulated. —



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leaves or fine wire burnt —

— May be struck on <sup>the</sup> bell of  
one conductor and brought to  
the mercury in contact with the  
other conductor — or with charcoal

— Fire leaf burn with the greatest  
brilliance, throwing out red rays  
of more than six inches in length

— All these more brilliant  
in oxygen gas. —

37. Gun powder — Hydrogen gas —  
Powder, pulverizing Mercury, lead  
on charcoal, all fired <sup>in 1/2</sup> <sup>1/2</sup> <sup>1/2</sup>  
Mr. Day —

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when insulated. —



42. The zinc pole produces a sound  
like on the tongue, the action is  
less than Alkaline. The form  
is both more intense and more  
lasting than the latter. —

43. Flesh of light from the zinc  
pole is light blue or greenish,  
from the other ferrous or reddish.

44. Put one or two thin slices  
of Phosphorus in the web  
of a candle and light it  
with Galvanism

45. Binigalle powder set on  
fire by Galvanism —

46 Lead or tin melted — wire —

47. Touch the wick of a candle  
with *Sp. Alcohol* or Turpen-  
tine and apply Galvanism

48. Mixture of *Os. m.* of *P. m.*  
and *Ammonia* found both  
Galvanism — Charcoal wick

49. *Os. m.* of *P. m.* and Sulphur  
soaked with Galvanism

50. Ditto with Phosphorus

51. Phosphorus in thin shreds  
wrapped round with fibres of cotton

52. Cotton dipped in oil Turpentine

52. Resin, Camphor, Elastic Gum  
softened by Galvanism



53. Put filings of zinc, copper  
Antimony, iron or Steel into  
an ignited Charcoal cuppel  
and throw a stream of oxygen  
gas from a bladder on the  
filings, they will burn rapid-  
ly -

54. Electric Cannon. —

55. Bengalle house burnt

56. Powder house ~~explodes~~ blown up.

57. If the positive pole be covered  
with gold leaf, and the nega-  
tive with a bit of charcoal  
on forming the communication  
the gold leaf burns brilliantly  
and the charcoal remains  
untouched; but if the gold leaf

~~is placed on the positive side~~  
be placed on the negative side  
and the charcoal on the positive,  
the charcoal burns and the  
g. leaf is melted

58. If the eye be made to commu-  
nicate with the positive  
pole it sees objects red, large  
and more distinct, with the  
negative pole, blue, smaller and  
more confused

59. The ear in contact with  
the positive all sounds more  
grave, with the negative more  
acute —

60. The positive pole disposes  
metals to combine with oxygen  
the negative with hydrogen.

N.B. The last four Expts. are Mr. Ritter's



61. If the prepared limbs  
of a frog be dipped in salt  
water, the contractions are  
more violent —

62. The contractions of the  
muscles of a living frog  
by galvanism is much  
less than when the animal  
is dead. —

63. The following compositions  
may be tried by applying a  
glass tube dipped into sulphuric  
acid. ~~These~~ These  
experiments may be per-  
formed as connected with the  
Galvanic Battery

Exp.

1 Ox: m: P: A: 3 parts  
Sulphur 1 —

2 Ox: m: P: A - 3  
Charcoal —  $\frac{1}{2}$   
Sulph. —  $\frac{1}{2}$

3 Ox: m: P: A - 1  
Arsenic — 1

4 Ox: m: P: A - 3  
Sugar - 1

5 Ox: m: P: A 3  
Charcoal - 1

6 Ox: m: P: A  $1\frac{1}{2}$   
Gun powder 3.

A pistol primed with this comp<sup>2</sup>  
was fired. —



7. Ox: m: P. A and Phosphor
8. Hydrogen Gas - Bladder  
 with stop cock and tube - Tube  
 introduced with Sulphur acid  
 and touched with Ox: m: P. A.  
 Prep the bladder - Gas taken for
9. Acetic acid produces a con-  
 siderable deflagration. —
-



64. A tea spoon left immersed in either the white or yolk of an egg suffers no change of colour; but in the act of eating, the spoon is discoloured, the end which goes furthest into the mouth is of the deepest black - Sulph. Hydrogen Gas. —

65. <sup>two</sup> If <sup>two</sup> pieces of Charcoal partially covered with cotton be fixed on the conducting wires, the cotton will be found either by itself, or when sprinkled with charcoal —

66. A wire connected with the Zinc end had the other immersed

in a vessel of water. A wire from the copper end ~~was~~ when brought near the surface of the water gave a crack or plop of light  $\approx \frac{1}{2}$  inch with a snap heard in an adjoining room like the hissing of red hot iron in water — reverse the conductor, only a small globe or spark, no snap. — W. Cruikshank.



## Galvanic Apparatus.

### Additional observations.

The small ~~for~~ machine is best put up in three coll. or piles. The first and second may be joined by the triangular piece, at bottom. The 2<sup>d</sup> and 3<sup>d</sup> at top by the rectangular piece of zinc. The 2<sup>d</sup> and third piles should be well insulated at bottom, which is best done by placing them on glass wiped perfectly dry.

If common salt be used, the solution should be nearly saturated. When a greater power is wanted, or for a short time, a pretty strong solution of Ammoniac may be used. But what I have found best of all for cooking the



which is mixed and diluted with  
water, in the proportion of about  
an ounce of acid to a pint or rather  
more of water. With this the machine  
acts uniformly and powerfully and the  
plates are ~~very~~ <sup>very</sup> easily cleaned. —

Great attention should be paid to clean-  
ing the plates, particularly the Zinc  
on the oxidation of which, alone, the  
power of the machine entirely depends.

The Gold wires, ~~having been found~~  
~~of little use~~ are now laid aside and  
two brass conductors, with large  
handles, are substituted in their  
place. These very much encrease the  
shock, and are, in every respect, far  
preferable to plain wires.

The Galvanic shock may be readily  
sent thro' any part of the body, like  
the common Electric shock —

## Example

Suppose the whole of the right side  
is to be galvanised — Place the lead  
weight in contact with the ~~the~~ bottom  
of the third cell of the battery as it  
is above described. To this hook a  
wire of any kind of metal, to the other  
end of this ~~wire~~ <sup>wire</sup> fix a broad  
\* piece of tin foil sprinkled with salt  
water and laid on the floor. On the  
tin foil place the bare right foot.  
Take now one of the large conductors  
in the right hand well wetted with  
salt water and touch the top of the  
first pile, the Galvanic discharge  
will pass along the right side,  
up if the feet pile ends with copper  
and down if with with Zinc.

\* It is best to paste the tin foil on  
a board. —



The Galvanic Machine has  
no tendency to grow old or  
weaker than at first. It will  
continue to act, with the same  
power, 'till the plates be cor-  
roded through, which, if proper  
care be taken, will not happen,  
I think, in ten years the use  
every day. —

When the same clothes have  
been used two or three times,  
they may be washed with hot  
water, to clear them of oxide.

It is best, on every occasion, to  
put up the whole battery of  
100 pair, for when a less power is

wanted, such as in Galvanizing  
the Eyes, Ears &c, this may be readily  
obtained, in any proportion, by  
applying one of the conductors  
to any intermediate points of any  
of the Piles. —

In <sup>the rainy</sup> the rainy season of the year, the  
Machine will act with equal power  
for near three days. It is best, however,  
to put it up in the morning, and  
take it down in the afternoon of  
next day. In this case, if ~~the~~ the  
Miner's Acid has been used, the  
Machine may be put up twice or  
even thrice without cleaning the plates.  
— Any weak acid may be used,  
but no ~~oil~~ oil, in cleaning. —



When both can on both  
eyes are to be Galvanize,  
it is more convenient, and  
it may possibly prove not  
less effectual, to Galvanize  
only one at a time, which  
may be readily done, by  
receiving the shock with  
the head of the opposite  
side.

J. Dimsdale

The shock depends entirely  
on the number, without having  
any regard to the surface of the  
metals. —

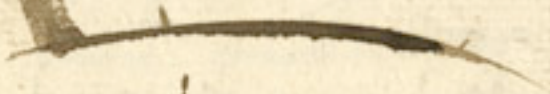
— The acid liquor which remains

— After pulling up the battery  
may be returned into the bottle  
for next occasion

— And with prepared may be  
had at 6 Rufus W. Doyen  
quint bottles, the bottles not  
included —



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The News



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