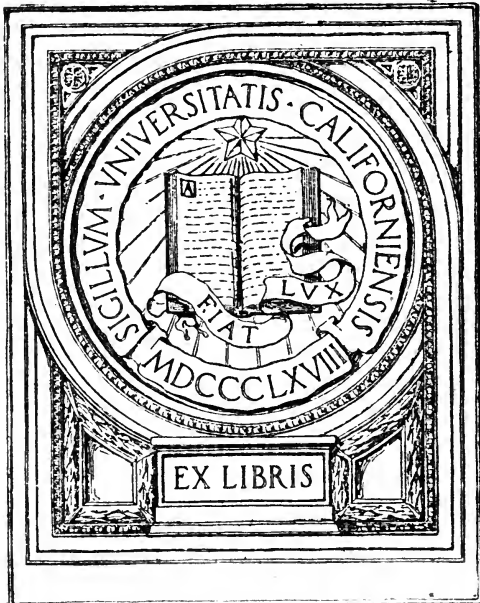




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roco suppartulario & suppartulario sunt ad inuicem recipiendos, eisdem nō  
to minime oportere possint. Alia qz multa hōt obseruanda essent. sed hec ip  
sa studioso & tercio discutienda pmutuū.

¶ Jacobo fabi Stapulensis Introductio in libros Arithmeticos di  
ui Sebastiani Boethii pariter & Jordanani

**N**umeritas numerorum  
Quaterus est multitudo ex vnicis aggregata.  
Numerus p̄ se simpliciter est numerus q̄ in p̄paracōe ad alterū  
minime p̄siderat. nec vt ad figuras geometricas applicat.  
Numerus ad aliqd̄ ē. q̄ in p̄paracōe ad aliter simpliciter p̄sideratur.  
Numerus fm̄ forma dicitur. p̄onit ad figuras geometricas applicatur.

¶ Numerus. lxxij. se.  
Numerus par est. quoniam duo equa diuidi potest.  
Numerus impar est. q̄ in duo equa minime diuidi potest.  
Numerus pariter par est. numerus par. cuius partes in duo equa ad vni  
tatem vsqz sectionem recipit.  
Numerus p̄ter ipam unitatem par. est. q̄ media cōm p̄tōnem non admittit.  
Numerus impariter par est. numerus par. cuius media equalit p̄tōnem  
admittit. sed p̄tō in duo equa paritōe citra vnitatem desinit.  
Numerus p̄fectus est numerus par. cuius omnes p̄pōtēs simpliciter accipere  
partes sui totus sumitur in plene.  
Parus ē. q̄ aliquid sumptū vnus ex eisdem nec deficiō sui totū metit.  
Numerus diuisus ē. q̄ in collectōe p̄tōnis ipso toto redit. q̄ & ipsa ē.  
Numerus abidans est. cuius in vni adiecta partes totū sumitur excedit.  
Cui & idem sup̄sui & nūcupat.  
Numerus p̄mo est numerus impar. q̄ sola vnitatem metit. & idem quos  
ip̄ incompositus nominat.

¶ Numerus p̄positus est numerus. quem non sola vnitatem. sed & alter numerus  
vni & ipm̄ mensurat. q̄ & idem secundus appellat.  
Numerus solū ad aliter fm̄ est numerus. q̄ fm̄ se p̄pōtēs est. ad aliter vero  
p̄parat. sola cō illō q̄ mensurat. par. in par.

¶ Numerus ad aliqd̄  
Numerus est. cui equalis numerus. ad eundem p̄paratur  
Inequalitas vero est. cum iniquitas ad iniquitatem p̄paratur  
Dicitur iniquitas est. cui numerus maior. q̄ dicitur iniquitas p̄paratur  
Dicitur vero iniquitas p̄tra. quoniam maior iniquitas p̄paratur  
Numerus multiplex est. cui maior numerus. inuicem p̄paratur. eundem plus  
q̄ in se p̄met. vt bis. ter. quater. & ita dicitur.  
Vnitatis numerus. sicut p̄cipuum. & ita dicitur appellatōe consensus.  
Duplus est. cui maior numerus. inuicem p̄paratur. minorē bis p̄met  
Triplus. cui ter p̄met.  
Quadruplus. cui quater.  
Quinarius. cui quōdo ē. h̄ parte dicitur fm̄ naturalis numerus. p̄gressione  
Numerus suppartularius est. cui maior numerus. inuicem p̄paratur. totū in  
se minorē numerus p̄met. & eius aliqui partes.

vale p̄ di 4. & la p̄ del □ di □ vale p̄ di 6. adunque la prima gnumita  
fu 18 p̄ di 4 183. & la seconda fu 6. & la terza fu 18 p̄ di 4 183 om̄i.  
S. 3 ē. P. 6. T. 18  
P. 4 1/2 □ m̄ p̄ 10 1/2 □ di □ m̄ 9 □ 18 □ 6 ē - 3 ē  
T. 4 1/2 □ p̄. 10 1/2 □ di □ m̄ 9 □, 54 □ c 18 □ - 54 □ c 7 1/2 n.  
S. 3 ē. P. 4 1/2 □ m̄ p̄ 10 1/2 □ di □ m̄ 9 □, 18 □ - 18 □ - 7 1/2 n.  
P. 4 1/2 □ m̄ p̄ 10 1/2 □ di □ m̄ 9 □, Vale la ē che c'è 2  
9 □ c 3 ē - 2 - 4 - - - - -  
18 p̄ 3 1/4 P. fu 18 p̄ p̄ 112.  
36 S. fu 6  
p̄ 183 T. fu 18 p̄ p̄ 183

Riprouo, 144 m̄ p̄ 183  
18 p̄ p̄ 183  
432 p̄ p̄ 161883 m̄ 288  
183 m̄ p̄ 161883  
183 m̄ p̄ 93312  
144

144 p̄ p̄ 93312  
m̄ p̄ 161883  
p̄ p̄ 161883  
144 m̄ p̄ 93312  
Fa 188  
216  
Fa 504  
18 n̄ p̄ 112  
18 p̄ p̄ 112  
36 - - - 6  
116 - - - 2  
432  
72

Com'era di bisogno 504.

**T**RHOUS 3 quantia nella continua propositione, che multiplicato la pri  
ma nella somma dell'altre 2 facci 60, & a multiplicato la terza nella sō  
ma dell'altre 2 facci 90, domando le dette quantia, nota che tale pro  
positione fara dalla prima quantia alla seconda, che c'è da 60 a 90, cio ē  
come 2 a 3, adunque potremo la prima fa 2 ē, & la seconda 3 ē segui  
rala terza 4 ē: & multiplicato ciascuna cosa all'altre 2 aggiuntio le loro  
multiplicatione, fanno 37 1/2 □, & questo ē eguale alla somme dette

da ē 2 tot' numer' subscripti' est dato; numeror' questra summa

¶ Dico numer' 47 2 1/2 37. 986. in vnum adiciendū et additur re  
cta lare p̄mi limitis numer' vniū p̄tūtur. 37. cuius prima nota 3. sub  
sumenda ē. et cetera dicitur vnus secundo limitis opponenda vnus 37  
mul. limitis numer' constituitur. 30. huius p̄ma nota 5. suo limitis subscr  
pta secunda. que vnus ē. et vnus limitis appōt. dicitur numer' cum ad  
iecta vnitate simul aggregata faciens 37. cuius adiciendū est ad finitū cē  
teris subscriptis. erit tota summa. 37. sic in. que vnus limitis subscr  
dum ē. et vnus summe p̄cedenti limitis figura ad sequenti limitis  
transfertur quod ad extremum d'ocentū fuerit cuius tota summa exp̄ssē  
ad finitram sub subscriptis annotanda ē.

**Quinta regula** ¶ Si in limite numeros in vnum colligendos continēte occurrat  
circularis figura. ca p̄mittenda ē inter colligendū. Vbi vero ea  
nota in totalis summe p̄mo aut medio quouis obuenit loco sub  
sumenda & exp̄ssē annotanda ē. et vnus numerus

¶ Prime partis ratio est. quia figura circularis nullius est significatiua  
in situ a seculum in deozum sumptū. que auctoz summa non reddat  
huius lare summa exempli. Sine addenda. numeri 30. 5. 40. 56. colligen  
do primi limitis numeros occurrunt due circularis figure dimittēde. Et  
cande partis ratio est q̄ figura p̄dicta circularis in limite d'ocentū in il  
nistrum p̄terea postea sequentes figure reddat vnus numer' in vna  
ora. Vbi in vnum colligendū numer' 63. 41. 223. 134. Prima nu  
merozum limitis in p̄mi summi collectozum summe figura est nota circula  
ris videt in p̄ma summe secūdi limitis. quare subscr̄bit p̄mo loco: sed  
cundo d'ocet. Summa vniū terzū limitis. 4. illis adicienda reddat sum  
mam totalem 1400.

**Sexta regula** ¶ Non oportet in additione tot esse immeros a dextra in leuā ver  
getes in limitio suppositis quoz sunt in suppositis nec; educto  
sed plures supascripi q̄ subscripti aut contra. Ita plures me  
dio q̄ extremis & educto possi possunt non in dextra sed solū sint  
sua parte variando.

¶ Exemplū vbi in dextra parte est iniquitas impediōe additiōem  
Plures superius Plures inferius Plures extremis  
q̄ inferius q̄ superius q̄ medio  
1 3 5 7 9 1 3 5 7  
= 4 5 8 9 9  
8 5 = 4 5 8 5  
9 = 1 3 5 7 = 4 5

¶ Q̄ si terzū exempli limitis extremi ponat medū & medū extremū. et  
vniū p̄tū. Sed hec p̄tō in dextra parte variādo non p̄tōt recta fieri



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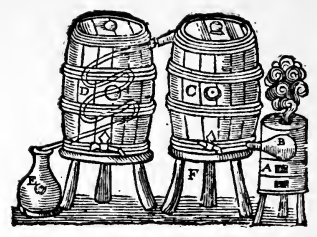
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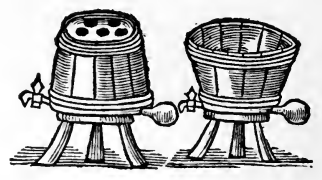
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A. The furnace with a Copper globe. B. The Copper globe.  
C. The distilling vessel. D. The refrigeratory with a worme.  
E. The receiver. F. Stooles on which the vessels stand.



A Balneum with a cover having holes in it for the glasses, set upon a treeloot.  
A wooden vessel for the making of Beer.

C o 2

A Tub

## Book. I. Of the Art of Distillation. 21

A furnace with his vessels, to distill liquors with the steam of boiling water.



A, Shows the head of the Alembick.  
B, The body thereof, placed in a brass vessel made for that purpose.  
C, A brass vessel perforated in many places to receive the vapour of the water. This vessel shall contain the Alembick compassed about with sawdust, not only that it may the better and longer retain the heat of the vapours, but also lest it should be broken by the hard touch of the brazen vessel.

D, Shows the brass vessel containing the water as it is plac'd in the Furnace.  
E, The Furnace containing the vessel.  
F, A Funnel by which you may now and then pour in water in stead of that which is vanisht and dissipated by the heat of the fire.  
G, The Receiver.

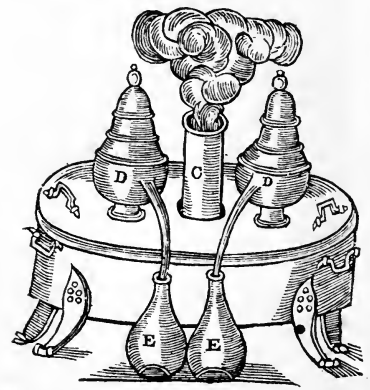
E 3

The

## Book. I. Of the Art of Distillation. 22

A *swasting water* made of Elder-berries.  
T Ake of Elder-berries as many as you please; press out the juice thereof; to every gallon thereof, put a pint of White-wine-vinegar, of the lees of White-wine a pint: let them stand in a wooden vessel, which thou mult then set in some warm place near the fire side for the space of a week; then distill them in a hot Still, or Alembick.

The Furnace for a Balneum Martis, with the Alembick and their Receiver.



A, Shows the brass kettle full of water.  
B, The cover of the kettle perforated in two places, to give passage for the steam of the water.  
C, A pipe or Chimney added to the kettle, wherein the fire is contained to heat the water.  
D, The Alembick consisting of its body and head.  
E, The Receivers, wherein the distilled liquor runs.

Fig 12

The

No. 8469 (page 431).  
An early chemical book.



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# AN ESSAY

ON THE

APPLICATION

OF

MATHEMATICAL ANALYSIS TO THE THEORIES OF  
ELECTRICITY AND MAGNETISM.

BY

GEORGE GREEN.

VON

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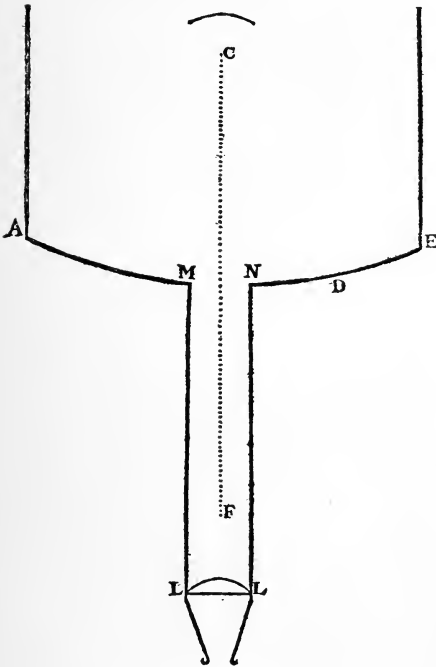
# CATOPTRICÆ ET DIOPTRICÆ SPHÆRICÆ ELEMENTA.

Auctore *DAVIDE GREGORIO*,  
M. D. Astronomiæ Professore *Saviliano*  
Oxoniz, & Societatis Regiæ Socio.



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98 DIOPTRICÆ

est  $a$  : Similiterque radii qui intra lentem ad  $\beta$  convergunt, refractione ad  $NLP$  à  $b$  divergunt, hoc est, radiantis  $AEB$ , distantia datâ  $VE$  à lente remoti, imago quæ distincta est oculo dato in  $o$ ; quoniam in data distantia  $oe$  oculo debita ponitur: sed & in angulo dato  $oob$  videtur ab oculo  $o$ , distantia datâ  $oL$ , à lente remoto, & lentis crassities  $VL$  æqualis est datæ rectæ. q. e. f.

Eadem constructio infervit, si oculus presbytae detur: in eo enim casu,  $aeB$  infinite distat, & rectæ quæ prius erant  $aL$ ,  $bL$ , ducendæ sunt per  $L$ , positione datis  $o$ ,  $ob$  parallelæ, & centrum superficiæ  $NLP$  (per *Corol. 6. Prop. XIV.*) triente rectæ  $Ls$  ab  $L$  distabit.

Quòd si visibile propositum longinquum sit, constructio adhuc simplicior evadet: centrum enim superficiæ anterioris  $KVM$  (per *Corol. 1. Prop. XIV.*) triente rectæ  $vs$  à vertice  $v$  distabit.

*Prop. XXIV.*

[95]

distantiam ejusdem ab oculi centro, ita tangens semianguli visorii imaginis primæ ex oculi centro, ad tangentem semianguli visorii ejusdem imaginis primæ, ex vertice suæ emergence, vel semianguli visorii imaginis secundæ, ex vertice suæ incidentiæ: & rursus ut distantia imaginis secundæ à vertice suæ emergence, ad distantiam ejusdem à vertice suæ incidentiæ; ita tangens semianguli visorii imaginis secundæ ex vertice suæ incidentiæ, ad tangentem semianguli visorii imaginis secundæ ex vertice suæ emergence, vel semianguli visorii imaginis tertie ex vertice suæ incidentiæ: & ita progrediatur ad semiangulum visorium imaginis ultimæ ex vertice suæ emergence, seu visibilis ex vertice suæ incidentiæ, qui semiangulus duplicatus dat angulum visibilis quæritur ex vertice suæ incidentiæ. Demonstrationem videre licet in *Prop. 53 & 57* hujus.

De Mechanicæ horum speculorum, & lentium, ab aliis frustra tentata; ego in mechanicis minus versatus nihil dico: sudafter tamen aliter, optice perfectionem in lentibus & speculis sphericis frustra quærit: Si vero cui placeat poterit præcipuus hujus tractatus propositiones, sphericis applicare; est non adeo perfectæ: Portio enim sphaeræ (præterquam quod radios parallelos in unum punctum non congregat) locum imaginis præbet in una superficie sphaerica, habente idem centrum cum portione; quæ superficies non potest omnimodo concurrere cum alia superficie sphaerica: igitur tamen concurrens requiritur, saltem ad sensum, ut ex prædictis satis apparet. Aliæ etiam sunt lentium sphaericarum imperfectiones, à dictis emergentes: veluti, quod in telescopiis multum amplificantiis, pertinet ad imaginem ultimam, vix poterit ultra duos vel tres gradus dilatari; ut computanti satis patebit; unde provenit horrenda obscuritas. At contra, lentes hyperbolicas solum obijciunt, quod nihil possit distinctissime videre, præter punctum visibilis, in axe machine existens: Sed hæc infirmitas (si ita appellare liceat) in ipso oculo est: satis manifesta; non tamen naturæ imputanda; quæ nihil frustra, sed omnia quam commodissime peragat. Nihilominus, lentibus, & speculis concavis non concessis; satis erit portionibus sphaericis uti loco sphaerico, & conoideon parabolico, in catoptrica; quæ hyperbolicarum ita dioptrica; cum quibus portiones sphaericæ minus conveniunt.

*Hic inur ad astra.*

*Prop.*

No. 8656 (page 439).

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MDLXXXV.

THADD. HAGECII  
aquæ copiam; & lubricant ob visciditatem; & maxime per vias vrinx transeunt. Quoniam autem Angli quoque, Cereuisia suo modo parata vtuntur, quid de ea censuerit Brudus Lusitar. us, vir doctus, placuit huic loco subnectere. Isigitur in libello de ratione victus in febribus ad Anglos in hæc verba scriptum reliquit: Potus, quo communiter Angli vtuntur, multiplex est; nempe vehemens, medius & imbecillior. Discrimen inter hos penes vehemenciam & imbecillitatem, calfacientem & refrigerantem, & penes substantiam crassitiam & tenuitatem habetur. Apud Anglos triplex semper paratur potus; nempe aquosus, quem simpliciter Cereuisiam dicunt; medius, quem trihapenninam; potens, quem duplam Cereuisiam nuncupant. Simplex eisdem effectus præstat, quos vinum aquosum: aperit siquidem, refrigerat & distributionem adiuvat. Nec decipiatur aliquis credens, ob eius amaritudinem calfacere: partes enim, quæ Cereuisiam amaram reddunt, pauca admodum sunt, si ad reliquas conferas, quæ in ipsa refrigerant. Quod colligere ex ratione lupulorum poteris atque & hordei portiones. Cito præterea amaritudo à Cereuisia euanescit: reliquarum verò partium facultas tam diu permanet, donec in aliam transmutetur substantiam. Potens Cereuisia, quæ duplicem dicunt, potenter calfacit; & aliquid habet vehementis, vt potens vinum. Trihapennina, mediæ naturæ est; manifestè calfacit, in nullo tamen vehemens est. Meruinit adhuc Brudus

543

in Lobley aduersary pag 271

Cereuisia, à Cereis dicta, sive Buda Tritonicæ Angli Britannicæ omnium suauissima & saluberrima, calidioribus regionibus utilissima et ceteris, inuicibilissima in parandis ratione exactissima, et largissima materia observationis, Angli-Britannici in uacuulo à C.D.I. Coys plantantur puritissima acapte

Rec. Aquæ fluxialis B Galb, mē 40 fortiorant hinc tamq̄ conuulsionis 7 part. spirit. de tyria d. in qua intus et mēsa et mēdium inuicis optimis Mallo; mēdium et triti: hinc ceteris uolueris per seram integram in cypra aut paulo gelid: tom, pond. per aspectu, liquor, uent, Britannicæ et Belgicæ uentur, p̄dix uentur in uacuulo

Cereuisia Martia uog, tant, inapimbal allud, p̄dixitina, in amū & dicitur p̄dixitina.

Rec. malle, uentur molit, in uicimū aut e, triti Meda

Xij. Arone modū  
p̄dixitina, p̄dixit aut Fab  
rū, et Tritici triton, iane  
tantumq̄ Ag: q. s. imple  
dis tribus uolū Aquitan  
mēt, aut Budozuka filij  
mēt uolū uolū Cereuisia  
et in uicibus triton.

Fortior tertius Aqua p̄dix  
ter, modo hupradico: infam  
tantur uent aqua p̄dix  
Banda tertius afferuerit

Et inf.

No. 8780 (page 445).

One of the earliest works on brewing.

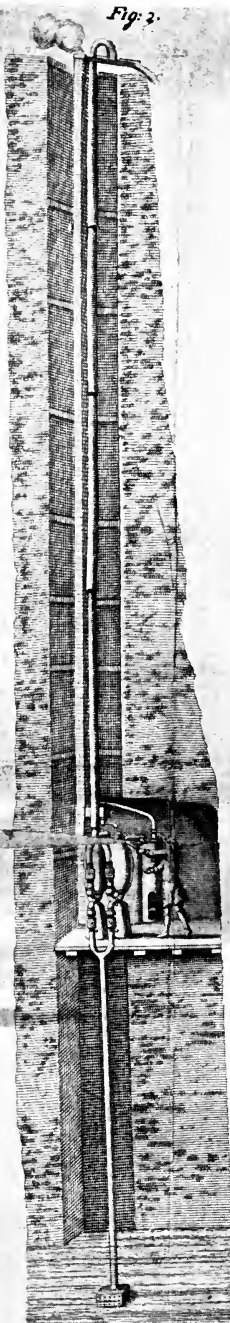


Fig. 2.

ENGINE  
For  
Raising Water  
BY FIRE.

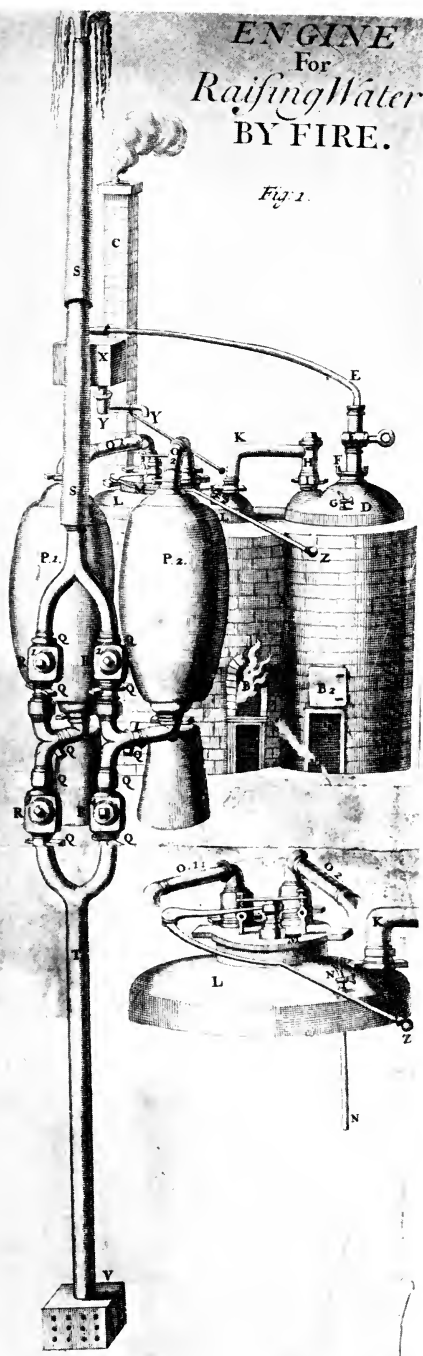


Fig. 1.

The  
ENGINE  
Working in a  
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B. Lewis delin. I. Sturt sculp.



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# Mr. Haüy's Mechanics

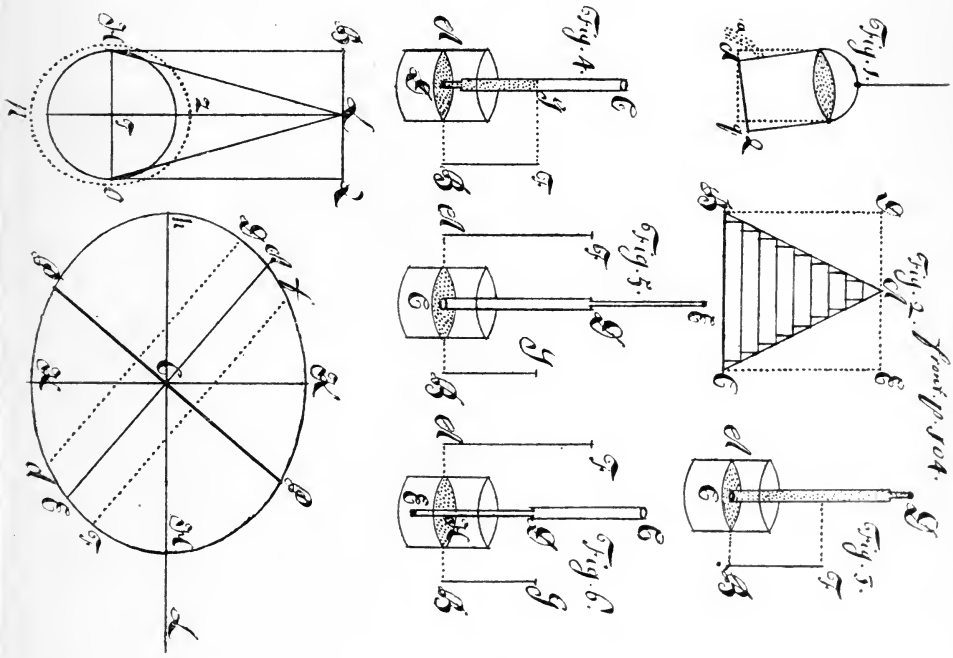
1. *Mechanick* is that Art of Natural Philosophy, w<sup>ch</sup> treats of Matter, & Laws of Motion.

2. What we have to say on this Subject shall be reduced to three Heads, Under y<sup>e</sup> 1<sup>st</sup> we shall explain y<sup>e</sup> Nature of Machines, considering y<sup>e</sup> Actions, & Powers of Matter acting contrary to y<sup>e</sup> weight of Gravity, & other Resistances. Under y<sup>e</sup> 2<sup>d</sup> we shall speak of the Laws, w<sup>ch</sup> relate to y<sup>e</sup> Effects of moving Force upon solid Bodies, as w<sup>ch</sup> are w<sup>ch</sup> belong to move without any Obstacle, or Resistance. In y<sup>e</sup> 3<sup>d</sup> we shall apply y<sup>e</sup> foregoing Principles to y<sup>e</sup> Motion of Astronomical Bodies, & show y<sup>e</sup> whole Planetary System is govern'd by 'em.

Part 1<sup>st</sup> of Motion in general.

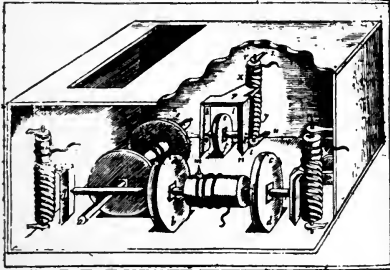
5. *Motion* is a continual passing out of one place into another, without continuing in y<sup>e</sup> same place for any Time; that Effection of Motion, by w<sup>ch</sup> a Body runs through a certain Space in uncertain Time is called y<sup>e</sup> Velocity, or Swiftness of Motion. The greater y<sup>e</sup> Force w<sup>ch</sup> is impressed upon a Body to make it change its Place, y<sup>e</sup> greater is its Motion. The y<sup>e</sup> Effect is always proportionable to its Cause, & that Force is called y<sup>e</sup> Momentum or Quantity of Motion.

Of



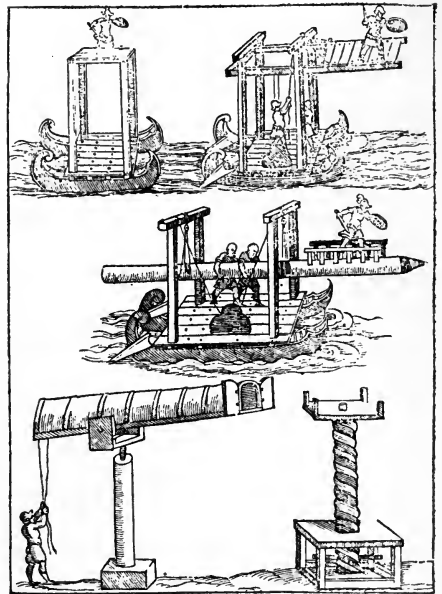
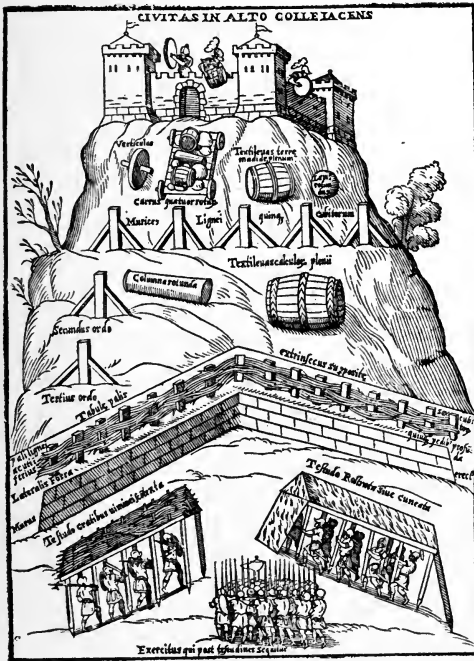
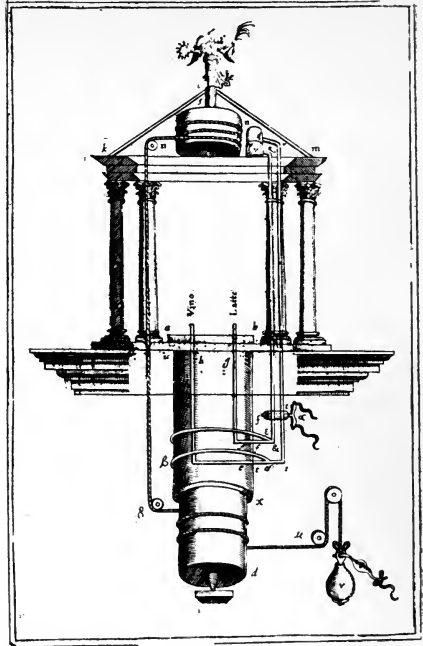


s, t, u, dentro questi si giri la vite x, y, e la lingua q, si cacci nel canale della detta vite. Quando dunque alti giri verà da tutte, x, y, s'alzerà, & abbafterà il rigolo



I, m, mediante la linguetta q. Accioche poi ciò per se medesimo si faccia, auiluppisi la corda intorno vna parte della vite, la quale habbia scambieiuoli auiluppamenti, & allentamenti aggomitolati, misurati agli spatij, ne quali si muoue la cassa; e le medesime cose si facciano ne gli altri due rigoli, ne i quali sono le punte g, h: Bisogna però auertire che le tre uitì siano al tutto eguali fra loro, e gli allentamenti parimente, accioche le tre ruote tutte insieme discendano, perche in questo modo il viaggio della cassetta farà facile, & insieme sicuro.

Egli è possibile in altro modo ancora fare, che la cassetta pigli le volte, non folo per vn rettangolo parallelogrammo, ma per qual si voglia figura di linee diritte; Anzi egli si può fare ancora che si muoua à bisficia, e ciò con modo più facile, che non è quello, che di sopra habbia: mo in-



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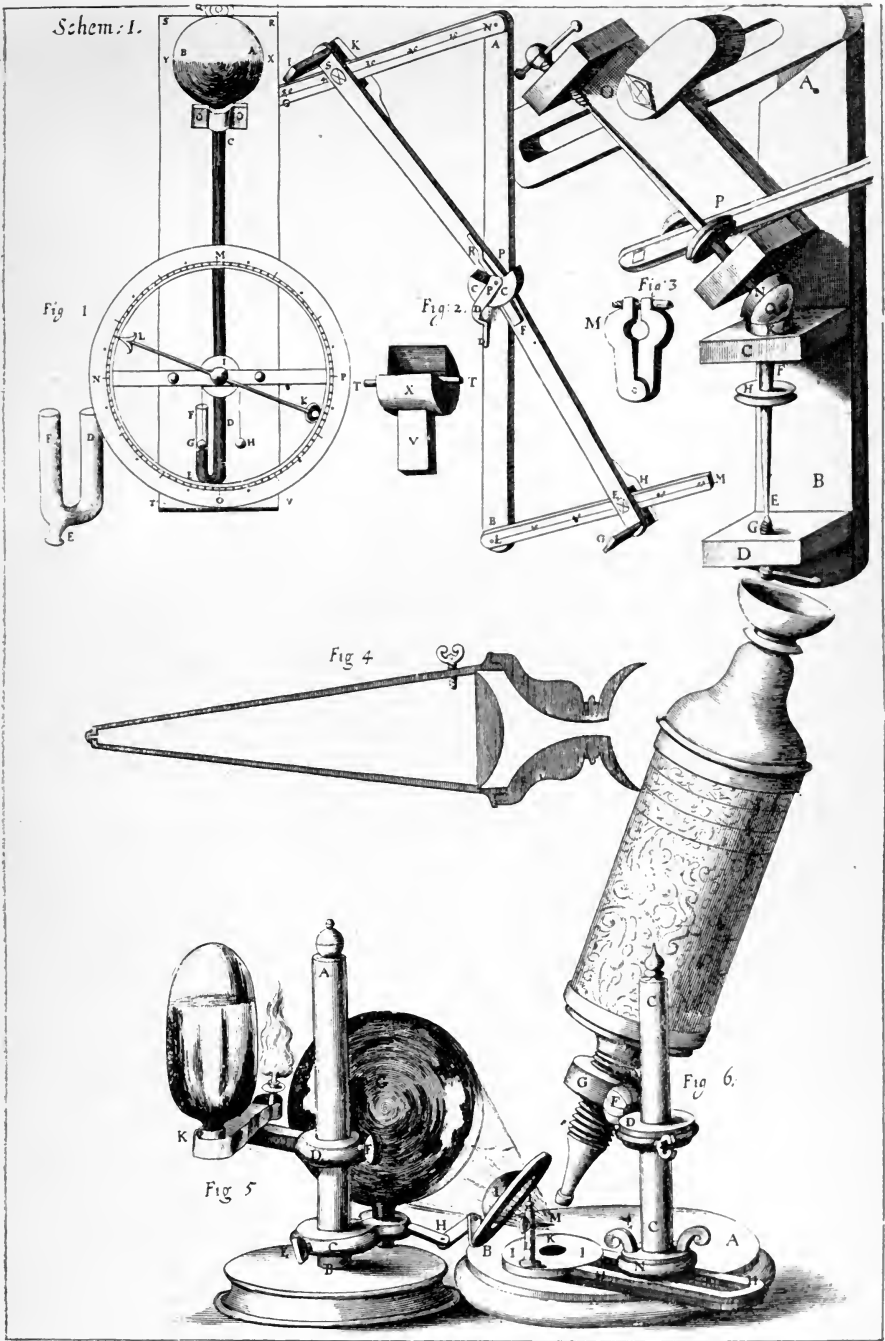
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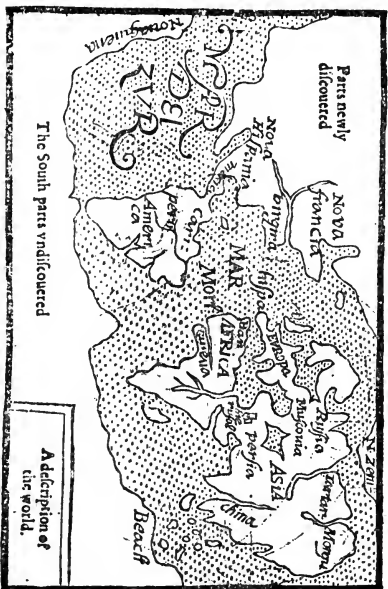


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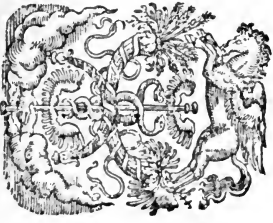
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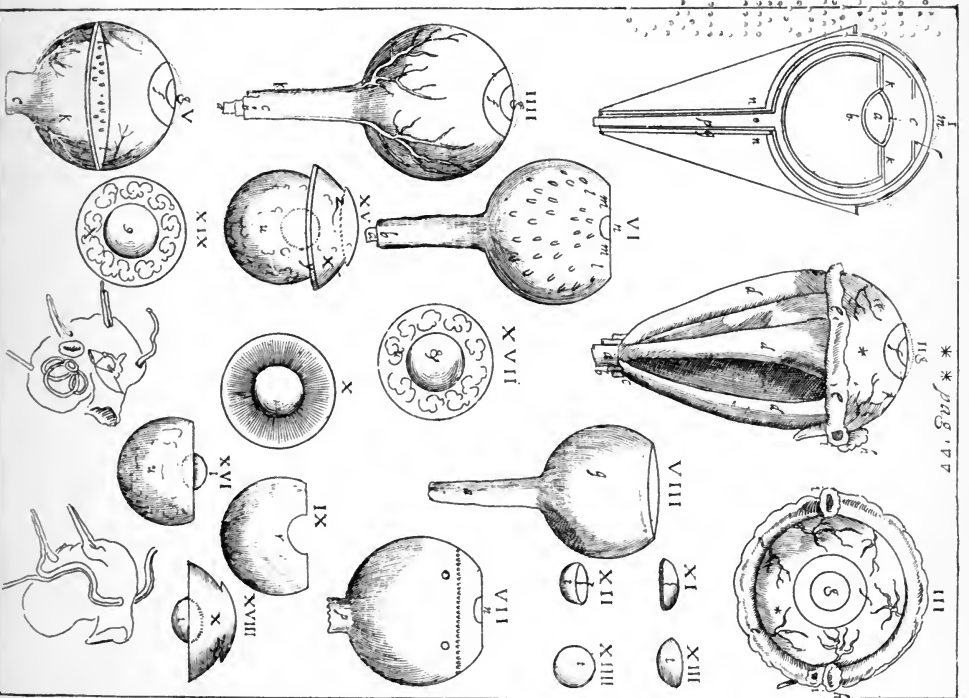


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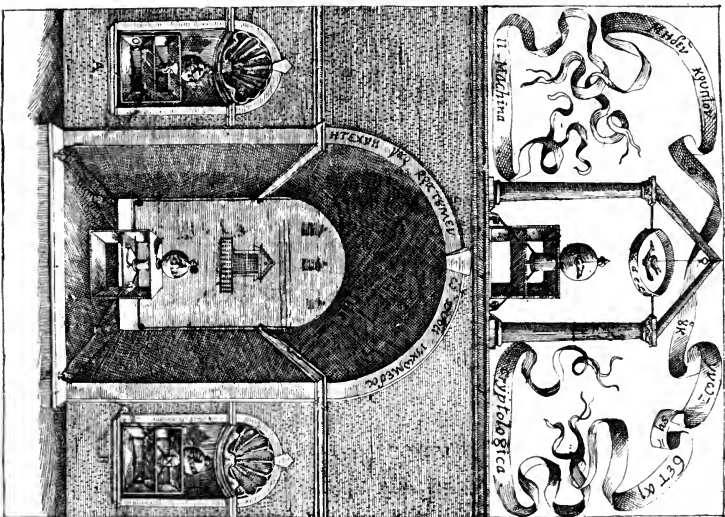


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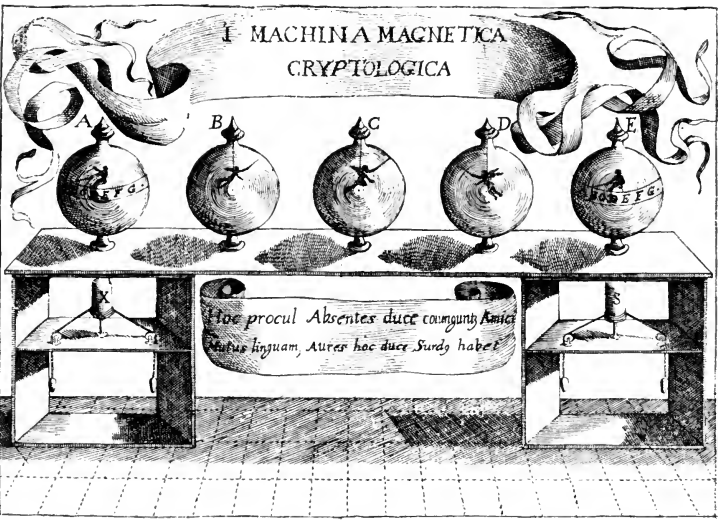
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tilissima ALGEBRÆ fundamenta, & perquam  
diluçide proponuntur, & ita explicantur, ut  
jam à quovis intelligi sine difficul-  
tate possint.*

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diôsè demonstranda, & usui ac-  
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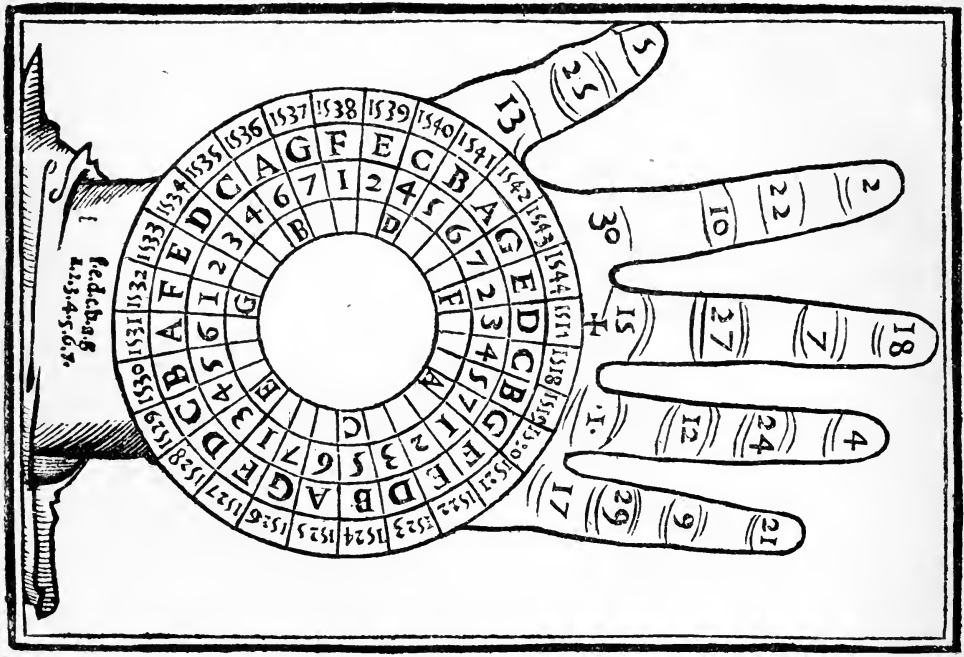
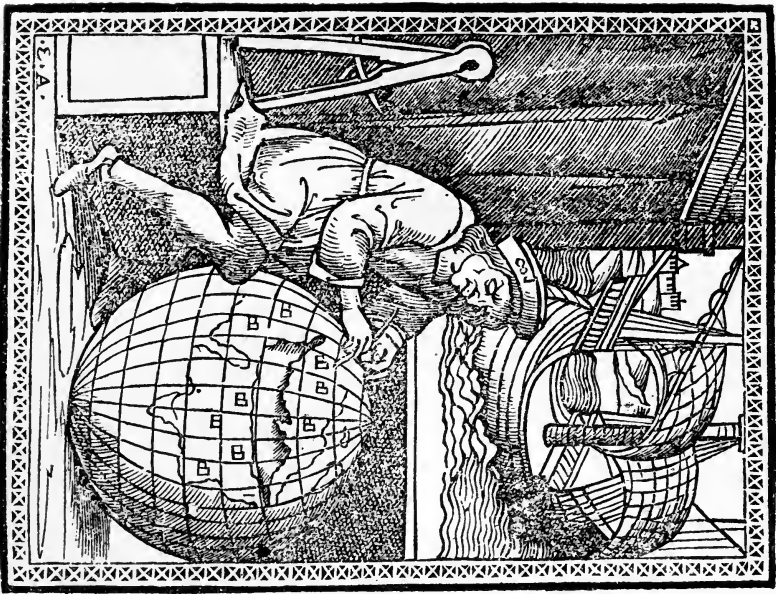
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 id est, Divisor.  
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 Notatu punctis, quæritur ex Tabula, Rad. Cubi-  
 ca de 42. Hic numerus non exat Sumo proxim. 3  
 26 cù Radicibz scribenda sub puncto. Ablatis 27  
 à 42 restant 15. Triplum Radicis inventa 3, est 9,  
 scribenda sub 7, caractere scilicet proximo sequen-  
 ti puncto. Eadem radix 3 ducta in hoc triplum 9  
 facit 27, Divisorẽ ponendũ loco sequenti: Duc-  
 tur linea. Quoties 27 in 158, vel 2 in 15? Invenio 5  
 quæ altera est radix, ponendo sub altero puncto.  
 Cubus de 5 est 125, supponendus ipsi puncto ant  
 invento Quotientis. Quadratum Quotientis ejus-  
 dem est 225, hoc ductum in Numerum primum  
 vel triplum 9, facit 225, scribenda loco sequenti.  
 Insuper Quotiens 5 multiplicatus in Divisorẽ 27  
 D 4 facit

**Libro de Abaco nouamente**  
 compoſto per magiſtro Frãceſco dala zdño Ve  
 ronede dquale inſegna a fare molte raſone  
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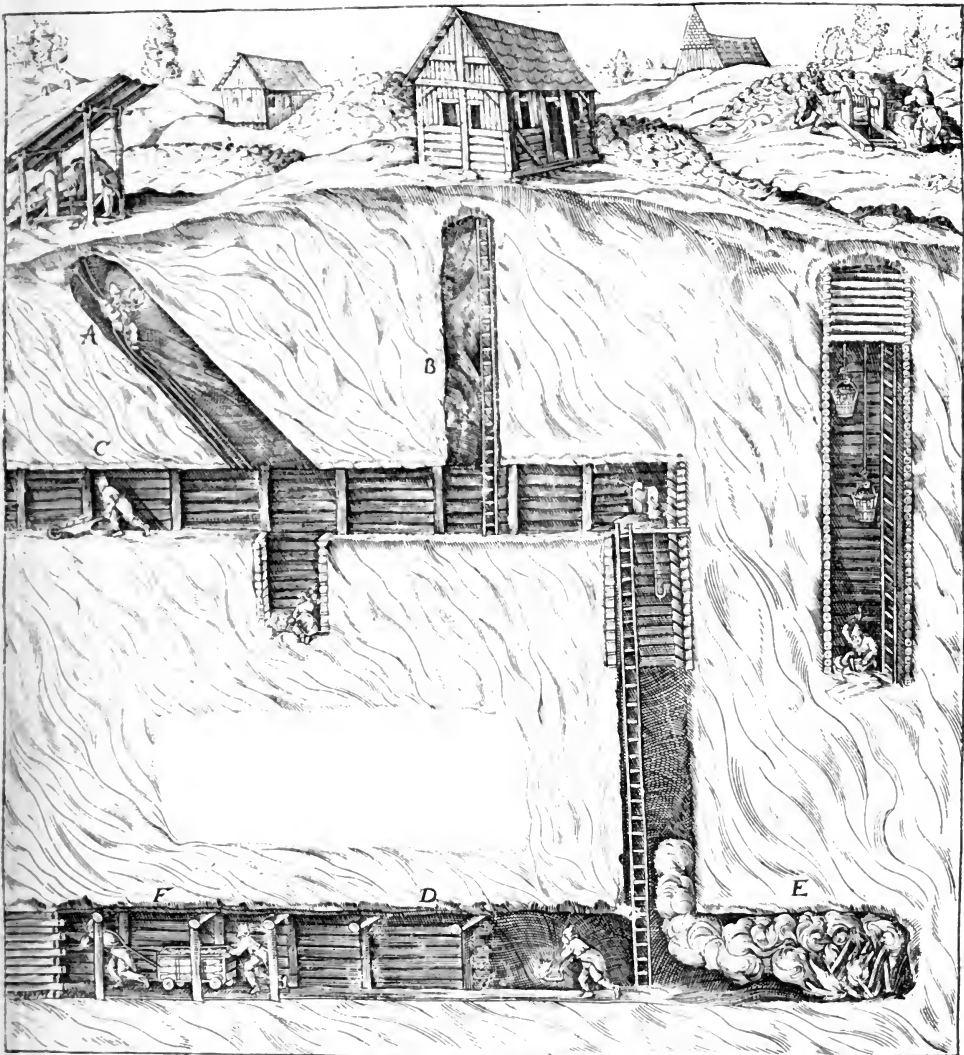
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The 'Appendix' (pp. 144), which has a separate title and pagination, is not contained in the following editions, and 'is rich in miscellaneous commercial information'.—*D. N. B.*

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As was remarked in the first division of the *Bibliotheca Chémico-Mathematica*, it is very sad that a mathematician endowed with such inspiring baptismal names should have ever lapsed from the stern virtue of a student of the exact sciences to the wholesale deprecation of public libraries for a long period of years!

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- 11377 — — — : A SIMILAR MANUSCRIPT, *very neatly and clearly written on 568 pp. of strong drawing paper, each page ruled with red ink, with many hundred illustrations, including numerous very pretty drawings in sepia, roy. folio, contemporary English calf gilt (binding slightly damaged and a few water-stains, otherwise in SPLENDID CONDITION)*, £2. 2s [c. 1756] The subjects contained in this manuscript are: Arithmetick; Logarithmetical Arithmetick; Geometry: Practical Geometry: Mensuration of Superficies: Cask Gauging: Plain Trigonometry: Spherical Geometry: Spherical Trigonometry: Heights and Distances: Geography and the Use of the Terrestrial Globe: The Construction of Maps and Charts: Navigation: Astronomy (including DIALLING): The Gregorian Kalendar [*sic*]: Of the Shifting of the Tides: Remarkable Observations and Accidents, etc., on board H.M.S. Britannia, Capt. F. R.: Surveying: Perspective: Fortification: Propositions of Motion applied to Mechanical Powers: Gunnery. It has as frontispiece 'A Plan and Elevation of the Royal Academy in his Majesty's Dock Yard Portsmouth.'
- 11378 **MANUSCRIPTE** (Old English): I. THE METHOD OF DELINEATING upon an HORIZONTAL and PERPENDICULAR PLANE by the PANTOGRAPHICALL INSTRUMENT, 3 pages, with 4 diagrams: II. THE DESCRIPTION of y<sup>e</sup> INSTRUMENT, 3 pages, with illustrations and leaf of drawings: III. A DESCRIPTION of the GRAPHICALL COMPASSE as it is used in Epipedography, 1 page, with illustration: IV. To MAKE the WATER for the WEATHER GLASSE, 2 pages, with illustration—4to., 10s 6d Svo. XVII.
- 11379 **MANZINI** (Carlo Antonio, *da Bologna*) L'OCCHIALE all' OCCHIO: DIOPTRICA PRATICA, dove si tratta della Luce, della Refrattione de' Raggi, dell' Occhio, della Vista, e degli Aiuti che dare si possono à gli Occhi per vedere quasi l'impossibile, dove in oltre si spiegano le REGOLE PRATICHE di FABBRICARE OCCHIALI à tutte le Viste, e CANNOCCHIALI da osservare i Pianeti, e le Stelle Fisse, da Terra, da Mare, et altri da ingrandire Migliaia di volte i minimi de gli Oggetti vicini; with fine etched portrait by Testana, and well-executed woodcuts of grinding and polishing tools, machines, and operations, besides diagrams, sm. 4to. contemporary vellum (FINE COPY); VERY RARE, £1. 15s Bologna, 1660 A rare and very interesting work, and one of the earliest containing copious descriptions and illustrations of contemporary methods of grinding and polishing glass for telescopes. An inscription beneath the portrait states that the author was 'il primo che sin hora habbia perfettamente praticato il fabricare occhiali.'
- 11380 **MANZONI** (Domenico) LA BRIEVE RISOLUZIONE di ARITMETICA universale, in qual si voglia Negotio, dove intervienga Numero, Peso, e Misura, con laquale si perviene all' Intelligètia della Valuta di qualunque Cosa apprettiata à Lire e Soldi di Moneta; with title within woodcut border, and fine and large woodcut initials, 12mo. contemporary limp vellum (binding damaged, also water-stained, and a few holes in last l.); VERY RARE, £2. 2s [col.:] Vinegia, al Poggio delle Gride in Rialto, 1553 An extremely rare work, described in the Supplement to Riccardi, who only knew one copy in the possession of Andrea Tessier. There was no copy in the Libri Library, nor was it known to Prof. de Morgan or Poggenдорff, who do not even mention the author's name.
- 11381 **MARCHAL** (—, *ingénieur des constructions navales*) LES NAVIRES de GUERRE les PLUS RÉCENTS; with 30 woodcuts, Svo. (pp. 127), hf. calf, 2s 6d 1876
- 11382 **MARCHETTI** (Alessandro, *da Pontormo*): PROBLEMATI VI à Leidensì quodam Geometra CHRISTOPHORO SADLERIO missa; ab hoc verò Germanis, Italisque Mathematicis proposita: resoluta ab A. M.; accesserunt bina eiusdem Auctoris THEOREMATI GEOMETRICA; with diagrams, 18mo. (pp. 48), *sewn (rare)*, 7s 6d Pisis, 1675

11384 **MAQUENNE (Léon)** Les SUCRES et leurs principaux DÉRIVÉS, 8vo. (pp. 1032), *cl.*, 7s 6d  
(p. F. 16. nett) 1900

This valuable work consists of a *résumé* of all the scientific researches on sugar which had hitherto been dispersed throughout the scientific journals of the various nations.

MARAT SAVANT :

11385 [**MARAT (Jean Paul)**, *Docteur en Médecine et Médecin des Gardes-du-Corps de Monseigneur le Comte d'Artois ; M.D. of St. Andrews ; killed by Charlotte Corday*] MÉMOIRE sur l'ÉLECTRICITÉ MÉDICALE, couronné le 6 Août 1783, par l'Académie Royale des Sciences, Belles-Lettres et Arts de Rouen, 8vo. *sewn* (RARE), 15s 1784

This work has the merit of being one of the first to treat soberly the subject of electro-therapeutics at a time when electricity was thought to be a panacea for every known disease, and when generally far more harm (referred to on p. 100) than good was done by the electrical enthusiasts.

11386 [—] NOTIONS ÉLÉMENTAIRES d'OPTIQUE ; with 2 copperplates, 8vo. boards, *uncut* (slightly water-stained) ; RARE, £1. 1s Didot, 1784

Though now chiefly known as one of the most hideous monsters of the Terror, and as the author of *L'Ami du Peuple*, the revolutionary journal, Marat was previously the author of works of no small scientific value. He was one of the first to attack Newton's emission theory of light—a heresy which prevented his election to the French Academy. He translated Newton's *Opticks* into French (*q. v. post*).

The above work gives the author's own theory—a curious variety of the corpuscular one.

[—] OPTIQUE de NEWTON, Traduction Nouvelle, faite par M\*\*\* (1787)—v. NEWTON, *post*.

11387 [—] RECHERCHES PHYSIQUES sur l'ÉLECTRICITÉ ; with 5 folding plates, 8vo. *sewn* (VERY RARE), £1. 15s 1782

This, like the rest of the author's works, is full of original ideas and experiments. Pp. 345-53 contain an interesting chapter, 'Des Phénomènes électriques relatifs à l'Ébranlement de la Lumière,' in which he attempts an explanation of the phenomena.

11388 [—] PHYSISCHE UNTERSUCHUNGEN über die ELEKTRICITÄT, übersetzt, mit Anmerkungen, von C. E. WEIGEL ; with 5 folding plates, 8vo. boards, with *auto. of C. G. Eschenbach* (*Prof. Chemistry, Univ. Leipzig, 1753-1831*), 12s 6d Leipzig, 1784

11389 [—] RECHERCHES PHYSIQUES sur le FEU ; with 7 folding plates, 8vo. *sewn* (RARE), £1. 5s 1780

11390 [—] ANOTHER COPY, boards, *uncut* ; or, *hf. cl.* (both nice clean copies), £1. 8s 6d

In this work the author attempts to give, by his theory of a *fluida igné*, a mechanical explanation of the phenomena of heat.

Marat stayed many years in England, and some time, as a teacher of French, in Edinburgh, where he published in 1774 a revolutionary pamphlet 'The Chains of Slavery.' On the recommendation of certain Edinburgh physicians he received the degree of M.D. from St. Andrews University. According to Chambers's *Encyclopædia*, he was already dying of 'a loathsome skin disease,' contracted while hiding in the sewers of Paris from Lafayette's police, when he received his death-blow from Charlotte Corday. The last two works contain the *Privilège* from Louis XVI. to his 'bien aimé, le sieur Marat,' who afterwards was the most ruthless promoter of his murder.

All his scientific works are now VERY RARE.

11391 [—] PHYSISCHE UNTERSUCHUNGEN über das FEUER, übersetzt, mit Anmerkungen, von CHRISTIAN EHRENFRIED WEIGEL, 8vo. *sewn*, 6s 6d Leipzig, 1782

11392 **MARAVIGNA (C.)** TAVOLE SINOTTICHE dell' ETNA, che comprendono la Topografia, la Descrizione de' Fenomeni, la Storia delle Eruzioni e la Mineralogia di questo Vulcano, Edizione 2<sup>da</sup>, accresciuta, folio folded to 8vo. *unbound*, 3s 6d Parigi, 1838

11393 **MARCELLI (Hercule, da Matelica)** OPERA nuovamente composta, nella quale si contengono 8 MODI di TARIFFE sopra delli dui nobilissimi Metalli, cioè, ORO et ARGENTO ; de diverse BONTÀ, ovvero FINEZZE, cõ li loro limitati PREGI, secondo il COSTUME di VINEZIA ; with *woodcut title, device at end, woodcuts, and numerous pretty woodcut initials*, 12mo. *old hf. vellum* (some *ll. water-stained, and one slightly defective*) ; VERY RARE, £2. 5s

[*col. :*] *Venetia, per Francesco Marcolini, 1556*

A very rare work, known to Riccardi (who is unable to give a collation or full description) only by repute, and unknown to Poggenorff, Brunet, Grassie, and other bibliographers. There was no copy in the Libri Library.

11394 **MARCET (Alexander John Gaspard)**, M.D., F.R.S. ; *husband of Mrs. Jane Marcet* CHEMICAL ACCOUNT of an ALUMINOUS CHALYBEATE SPRING in the ISLE of WIGHT, 4to. (pp. 36), *sewn, with author's inscr.*, 3s 1811

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11396 [**MARCET (Jane)**] CONVERSATIONS on CHEMISTRY ; in which the Elements of that Science are familiarly explained and illustrated by Experiments ; 4th Edition, considerably enlarged, with 14 plates, 2 vols. fcap. 8vo. *contemporary hf. morocco gilt*, 10s 6d 1813

11397 [—] SIXTEENTH EDITION, revised and corrected, with 18 plates, 2 vols. fcap. 8vo. *cl.*, 5s 1853  
This work will always retain a peculiar interest for having initiated Faraday, when a bookseller's errand-boy, into chemical knowledge. He acknowledged this fact in 1858 in an interesting letter to M. de la Rive (*cf. Dr. Bence Jones's Life and Letters of Faraday*).

11398 [—] CONVERSATIONS on NATURAL PHILOSOPHY ; in which the Elements of that Science are familiarly explained, and adapted to the Comprehension of Young Pupils, 13th Edition, with 24 plates, thick *post 8vo. cl.*, 3s 1858

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- 11403 **MARCHAND (Richard Felix, Univ. Halle)** LEHRBUCH DER PHYSIOLOGISCHEN CHEMIE; one vol. in 3 parts 8vo. *sewn*, 2s 6d Berlin, 1842-4
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- Important in connexion with the determination of the atomic weight of magnesium. The pamphlet is preceded by an interesting historical sketch on the subject.
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A rare work on magic squares, unknown to Poggendorff, Graesse, Ebert, and other bibliographers.

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This essay was awarded the prize by the Philosophical Faculty of the University of Berlin. The author is the discoverer of 'phototropy.'

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- 11411 — ERGEBNISSE der POLHÖHENBESTIMMUNGEN in BERLIN, ausgeführt 1889-91, am Universal-Transit der königlichen Sternwarte, roy. 4to. (pp. 29), *sewn*, 3s ibidem, 1902
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The most important of the above works is the *Essai de la Nature de l'Air*, which contains the law of compressibility of gases, known on the Continent as Mariotte's Law, although it was discovered 17 years before by Robert Boyle (*v. Nos. 540 and 624 ante*). Of importance also is his *Essai du Chaud et du Froid*, which includes observations on radiant heat, and the *Traité de la Percussion*, containing original investigations on the subject, and his percussion apparatus in use at the present time in physical laboratories.
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- 11495 — SECOND EDITION [enlarged], with 81 *folding copperplates*, 3 vols. 8vo. *old calf*, 12s 6d 1759  
 This edition (which was unknown to *D. N. B.*, where the first only is mentioned) contains a further appendix 'concerning the Improvements in Optical Instruments', giving a description of the author's Universal Compound Microscope, his New Solar Microscope, and his Equatorial Telescope, the last of which is interesting for illustrating an early form of an equatorial stand, with 6 *extra plates*.
- 11496 — FOURTH [LAST] EDITION, with 81 *folding copperplates*, 3 vols. 8vo. *old trec. calf extra*, 14s 1788  
 The above lectures were probably inspired by those of Dr. Desaguliers, to whom Martin acted as an assistant, a fact unknown to *D. N. B.*, and other biographies, but brought to light by Prof. de Morgan from a pamphlet published in 1751 by Bp. Horne.
- 11497 — The PHILOSOPHICAL GRAMMAR: a View of the Present State of EXPERIMENTAL PHYSIOLOGY, or Natural Philosophy. I. SOMATOLOGY: the universal Nature and Properties of Matter, etc. II. COSMOLOGY. III. AEROLOGY, shewing the wonderful Nature and Properties of the Air, Wind, Meteors, etc. IV. GEOLOGY, first edition, with 16 *folding plates*, sm. 8vo. *hf. roan* (title mended, and a few ll. torn); rare, 6s 6d 1735
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 This work was unknown to the author's biographer in *D. N. B.* One plate illustrates the author's patent 'frictionless' pump.

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Intended as a continuation to the 'Sure Guide'. It was unknown to the author's biographer in *D. N. B.* Appended is a list of 'Instruments invented or improved by B. Martin.'
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Of historical interest. There is a chapter on 'Electric Motors in Marine and Aerial Navigation.'
- 11518 **MARTIN (Thomas Henri; Univ. Rennes)** TEXTES ANCIENS sur les VERRES COMBURANTS par RÉFRACTION, 4to. (pp. 4), *sewn*, 2s 6d [Rome], 1868
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- 11523 **MARTINO (Pietro di; Univ. Naples)** NUOVE ISTITUZIONI d'ARITMETICA PRATICA, in questa nuova Impressione migliorate, ed accresciute, e da infiniti Errori che nelle passate Edizioni erano scorsi esattamente corrette, sm. Svo. *old vellum*, 8s 6d *Napoli*, 1786  
'Questo buon corso di aritmetica elementare è con lode registrato dal Torre'.—*Riccardi*. It was unknown to Prof. de Morgan, nor was there a copy of any edition in the Libri Collection.
- 11524 **MARUM (Martinus van):** [DISCOURS prononcé au Premier Congrès des Naturalistes et Médecins des Pays-Bas], par J. BOSSCHA, large impl. Svo. (pp. 22), *sewn*, 3s *Haarlem*, 1899  
'Prof. [Sir] T. E. Thorpe with kind regards from the Author'.—*Inscr. on title*.  
According to the author, Martinus van Marum (A.D. 1750-1838) was the first to liquefy ammonia—the first known liquefaction of any gas—a fact not mentioned by Faraday in his account of the experiments of his predecessors.
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An interesting account of the steam-carriage of Sir Goldsworthy Gurney, which ran in 1831 for three months with passengers between Cheltenham and Gloucester; of Hancock's steam-omnibuses, which plied between London and Brighton, carried from 14 to 16 passengers, and attained a speed of 10 or 12 miles per hour, and Gibb's and Alexander Gordon's steam-carriages (v. No 8524 ante). It is a curiosity of invention that while England was the pioneer of steam locomotion not only on railways but on common roads, France after seventy years was the perfecter of road-locomotion by the internal combustion engine.

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Milano, 1811  
The author was awarded for this invention its gold medal by the Government on the recommendation of the Institute of Milan.
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(p. F. 25 nett) 1896
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to the product of each multiplication add the numerator of this fraction, then divide the product of both those aggregates multiplied together by the product of both the denominators of the fractions multiplied together, &c the quotient will be your request.

*Examples.*

$$\frac{1}{2} \text{ by } \frac{1}{2} = \frac{1}{4} \text{ Fact } 7 \frac{1}{4}$$

$$\frac{1 \frac{1}{2}}{3 \frac{1}{2}} \text{ Fact } 9 \frac{7}{8}$$

$$\frac{3 \frac{1}{2}}{7} \text{ by } 5 = 15 \frac{1}{2}$$

$$5 \frac{1}{4} \text{ by } 4 = 22$$

$$19 \frac{1}{2} \text{ Fact } 15 \frac{1}{2}$$

Abreuiation of the worke of some of the former examples,

$$\frac{1}{2} \text{ by } 9 = \frac{9}{2} \text{ Fact } 4 \frac{1}{2} \text{ by } 3 = 13 \frac{1}{2}$$

$$\frac{1 \frac{1}{2}}{7 \frac{1}{2}} \text{ Fact } 7 \frac{1}{2} = \frac{3 \frac{1}{2}}{2 \frac{1}{2}} \text{ Fact } 15 \frac{1}{2}$$

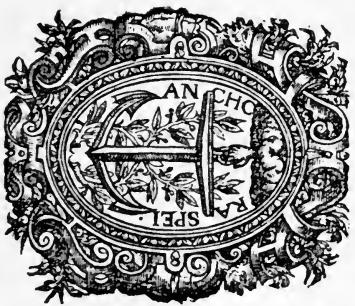
*The reverse instruction is, of Division in fractions.*

**T**O divide a fraction given, by a fraction (of the same kinde) given, bring them both vnder one common denominator, then divide the new found numerator of the dividend by the new found numerator of the divider, and the quotient is the quotient of the fractions given, the dividend being divided by the divider. If a whole number be to be divided by a fraction, multiply the whole number by the denominator of the fraction, and divide the product by the numerator of the said fraction, then the quotient will be the quotient of the whole number divided by the fraction. Contrariwise if a fraction be to be divided by a whole number, the numerator of the fraction is numerator to the fraction of the quotient, and the product of the whole number multiplied by the denominator is the denominator. If a whole number and a fraction be to be divided by a whole number, multiply the whole number which hath the fraction joyned with

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omnes Angeli: tibi caeli, & uni ver sa po te sta tes.

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Indice.

BASILIAE, PER IOAN. METZGERIUM.

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PHYSICES.

Quid est Physica doctrina?



ST. que faciem, qualitates, & motus omnium corporum in speciebus in natura, et causis generationum, corruptionum, & aliorum modorum in elementis, & alijs corporibus, que ex elementis, & huiusmodi affectionibus, & connexionibus oritur et in ea, uel a illis, & quomodo in hac caligine per se, non nisi in intellectu humani conciliatur. Quod eo additur, quia in natura si penitus perspicitur, tum uero Physica cognitio esset ingens, immensa, & diuina quedam sapientia, & mirabiliter adficeretur animi administratio ratione totius nature. Inuaret enim primum nosse ordinem celestium corporum, & elementorum, & in hoc domicilio collocat' hominem, qui solis inter species corporis est natura rationalis. Deinde considerata distinctione specierum, scire iuaret, cur hae species semper manant: an homo cum antecessat ceteris, tantum sit ad hanc erumnosam & eui necentem uitam conditus: hoc est, sic ne frustra conditus: quae sit mentis natura, quae partium corporis praecipuarum, cerebri, cordis, neruorum, quae cum sint res frigidae, & uideantur fordidae, tamen actiues & motus habeant mirandos.

B. 2



*J. Lilly Pinxit*

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The above is a very rare, if not unique, issue, not only from having a portrait added, but also for having, in place of the 'Almanac Perpetuel' usually occurring, a 'Table des Pieds Quarrez et Pieds Cubiques'.

This is the author's most important work (no English edition of which has ever been published), and includes his invention of the plunger pump, containing the gland and stuffing box—a contrivance often erroneously attributed to James Watt. The appendix contains 'Reflexions très-curieuses sur la Proportion Continue', 'Table pour la Quadrature du Cercle', and huit Problèmes de Mechanique proposez aux plus habiles Machinistes du Siècle'.

'Morland was one of the chief mechanicians of his time. His most important discoveries were in connexion with hydrostatics. The problems connected with raising water to a height by mechanical means were receiving a great amount of attention during the middle of the XVII. century, and to the discoveries in this field (in which Morland bore an important part) are largely attributed the subsequent rapid development of the steam-engine and the accelerated rate of evolution in mechanical science generally'.—D. N. B.

In the original MS. of the above work (preserved in the British Museum) the author made an important suggestion for employing steam for working pumps, which made him one of the first to demonstrate the practical utility of steam-power.

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 The author was appointed in 1741 headmaster of the Royal Military Academy, Woolwich, then 'a mere school', and on its enlargement professor of fortification and artillery. He was a colleague of Thomas Simpson, F.R.S., professor of mathematics in the same institution.
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 Including a price list of photographic cameras, etc. (pp. 28).

- 12279 **MÜLLER** (Philipp; *Prof. Mathematics and Physics, Univ. Leipzig*), *HYPOTYPOSIS COMETÆ NUPERRIME VISI, una cum brevi Repetitione DOCTRINÆ COMETICÆ, ex Recentiorum Fundamentis Stabiliendæ Veritatis ergo in Disputationem Publicam oblatâ; with engravings on copper illustrating the course of the Comet of Nov. 26th-Dec. 14, 1618, 4to. sewn (rare)*, 10s 6d  
[*col.*] Lipsie, G. Liger, 1619

Interesting as an early work on cometary astronomy. It is not noticed by Brunet, Graesse, or Ebert, but mentioned by Poggenorff as 'Hypothesis Comete'.

According to *Allgemeine Deutsche Biographie*, where there is a very meagre account of the author, he occupied himself chiefly with attempting to explain the nature of comets.

- 12280 — **MIRACULA CHYMICA et MYSTERIA MEDICA**, Libris V enucleata, ex Recensione GERARDI BLASII; *with engraved title and woodcuts of chemical apparatus*, 18mo. *sound copy in contemporary white vellum (rare)*, 10s 6d  
Amstelodami, 1659

According to H. Kopp the author was the first to mention in the above work dry acetate of potassium (before him only known in solution) under the name of *terra foliata*.

- 12281 **MUNBY** (Alan Edward, F.C.S.) **INTRODUCTION to the CHEMISTRY and PHYSICS of BUILDING MATERIALS, with woodcuts**, large cr. 8vo. cl., 4s (p. 6s nett) 1909

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Erfordiæ, 1739

The author was really related to the famous 'Baron Münchhausen'.

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Both the above copies contain the large folding map, 'The Silurian Region and adjacent Counties of England and Wales geologically illustrated', which is often missing.

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The above pamphlet was unknown to the author's biographer in *D. N. B.*

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- 12338 ——— THE CONSTRUCTION of the WONDERFUL CANON of LOGARITHMS, translated, with Notes, and CATALOGUE of the VARIOUS EDITIONS of NAPIER'S WORKS, by WILLIAM RAE MACDONALD, *ibidem*, 1889
- Dedicated to Lord Napier and Etrick, Napier of Merchiston's representative. It contains a very complete and valuable bibliography of the author's works, as well as a biographical introduction. Only 250 copies were printed.
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as to the *first application* of the gas, as an *economical substitute* for oils and tallow, in the production of light for public and private purposes. This is what I have claimed, and for which I have been honoured with the Royal Society's gold medal; disgraced, I should rather say, if I have *no claim* to the merit thus imputed to me.

But how has this committee stripped me of my claim? Did the German *Diller*, by his philosophical fire-works at the Lyceum, by "his large lustres of little flames in the centre of the room," exhibited for the amusement of the curious and ignorant, make the application of gas to purposes of public and private *utility*; guarding, as I am informed he did, at the same time, his mode of proceeding, with all the mercenary caution of a juggler? Can the Gas-Committee set this puppet-

*In Parliament.*

## REMARKS

UPON THE

## BILL

FOR

INCORPORATING

THE

GAS LIGHT

AND

COKE COMPANY.

LONDON:

Printed by GEORGE SIDNEY, Northumberland-street, Strand.

1809.

A  
**LETTER,**  
TO A  
**MEMBER OF PARLIAMENT,**  
FROM  
*Mr. William Murdock,*  
IN  
VINDICATION  
OF HIS  
**CHARACTER AND CLAIMS,**  
IN  
**REPLY**  
TO A  
RECENT PUBLICATION,  
BY THE  
**Committee**  
FOR  
CONDUCTING THROUGH PARLIAMENT  
A BILL  
FOR INCORPORATING A  
**GAS-LIGHT & COKE COMPANY.**

LONDON:

PRINTED BY GALABIN AND MARCHANT, INGRAM-COURT,  
FENCURCH-STREET.  
1809.

*An account of the application of the Gas from Coal to economical purposes, by Mr. WILLIAM MURDOCK, read before the Royal Society, on the 25th February, 1808, and printed in the Philosophical Transactions for that year.*

The facts and results intended to be communicated in this paper, are founded upon observations made during the present winter at the Cotton Manufactory of Messrs. Philips and Lee at Manchester, where the light obtained by the combustion of the Gas from Coal is used upon a very large scale; the Apparatus for its production and application having been prepared by me at the Works of Messrs. Boulton, Watt, and Co. at Soho.

The whole of the rooms of this Cotton Mill which I believe, the most extensive in the united Kingdom, as well as its counting houses and store rooms; and the adjacent dwelling house of Mr. Lee, are lighted with the Gas from Coal. The total quantity of light used during the hours of burning, has been ascertained by a comparison of shadows, to be about equal to the light which 2500 mould candles, of six in the pound, would give; each of the candles with which the comparison was made, consuming at the rate of  $\frac{1}{10}$  of an ounce, (175 grs.) of tallow per hour.

The quantity of light is necessarily liable to some variation, from the difficulty of adjusting all the flames so as to be perfectly equal at all times. But the admirable precision and exactness with which the business of this Mill is conducted, afforded as excellent an opportunity of making the comparative trials I had in view, as is perhaps likely to be ever obtained in general practice. And the experiments being made upon so large a scale, and for a considerable period of time, may I think be assumed as a sufficiently accurate standard for determining the advan-

Nos. 12294-7 (page 612).  
The invention of gas lighting.



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SEV NVMERATIONIS  
PER VIRGULAS  
LIBRI DVO:**

Cum APPENDICE de expeditif-  
simo MULTIPLICATIONIS  
PROMPTUARIO.

Quibus accessit & ARITHMETICÆ  
LOCALIS LIBER VNVS.

Auctore & Inventore IOANNE  
NEPERO, Barone MER-  
CHISTONII, &c.  
SCOTO.



EDINBURGI,  
Excudebat Andreas Hart, 1617.

**CAPVT PRIMVM.**

Facies quarte virgule

	1	2	3	4	5	6	7	8	9
1		2	3	4	5	6	7	8	9
2	2		3	4	5	6	7	8	9
3	3	2		4	5	6	7	8	9
4	4	3	2		5	6	7	8	9
5	5	4	3	2		6	7	8	9
6	6	5	4	3	2		7	8	9
7	7	6	5	4	3	2		8	9
8	8	7	6	5	4	3	2		9
9	9	8	7	6	5	4	3	2	

Facies sextæ virgule

	1	3	4	5
1		3	4	5
2	2		4	5
3	3	2		5
4	4	3	2	
5	5	4	3	2
6	6	5	4	3
7	7	6	5	4
8	8	7	6	5
9	9	8	7	6

Facies septime virgule

	1	4	5	6
1		4	5	6
2	2		5	6
3	3	2		6
4	4	3	2	
5	5	4	3	2
6	6	5	4	3
7	7	6	5	4
8	8	7	6	5
9	9	8	7	6

Facies octave virgule

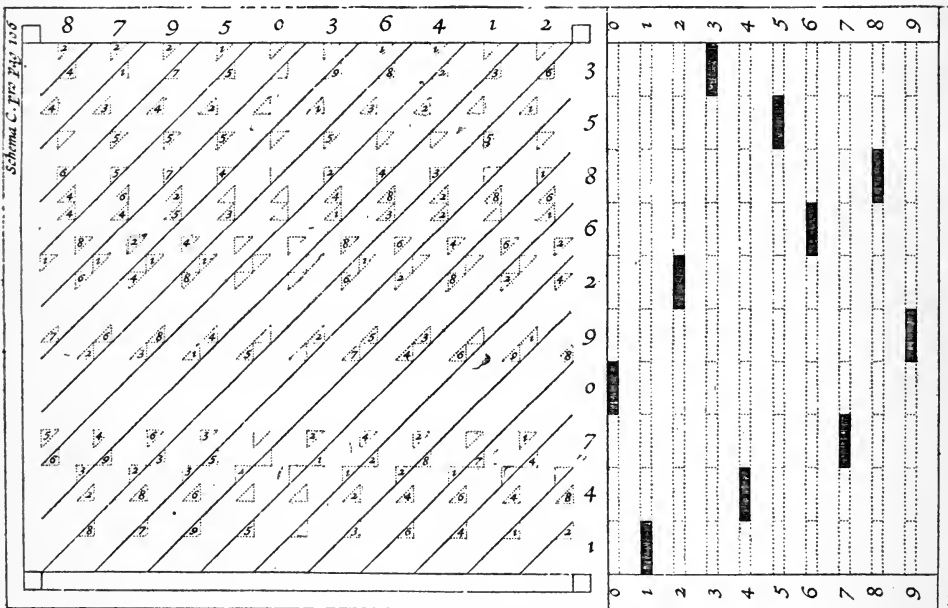
	2	3	4	5
2		3	4	5
3	3		4	5
4	4	3		5
5	5	4	3	
6	6	5	4	3
7	7	6	5	4
8	8	7	6	5
9	9	8	7	6

9

III

A

4



Nos. 12339-41 (page 614).

Counting by rods ('Napier's Bones').

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The author was professor of mathematics in the University of Cologne, and according to *Allgemeine Deutsche Biographie*, an adept in astrology, who had found a new method of casting the horoscope.  
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This is the only collected edition of Newton's works, now becoming increasingly rare. It was the first to contain his important *Geometrica Analytica*. The following is a list of the works reprinted in it:—I. *Arithmetica Universalis*. *Tractatus de Rationibus*. *Analysis per Æquationes*. *Excerpta ad Series Fluxionesque pertinentia*. *De Quadratura Curvarum*. *Geometria Analytica*. *Methodus Differentialis*. *Enumeratio Linearum Tertii Ordinis*; II.—III. *Principia*. *Lectiones Opticæ*: IV. *Opticks*. *Letters on Various Subjects*. *Letters to Mr. Boyle*. *Tabule Colorum et Refractionum*. *De Problematis Bernoullianis*. *Propositions for determining the Motions of a Body urged by two Central Forces*. *Four Letters to Dr. Bentley*. *Commercium Epistolicum, cum Additamentis*: V. *Chronology of Ancient Kingdoms*. *Short Chronicle from a MS. Prophecies of Daniel and the Apocalypse*. *Two Notable Corruptions of Scripture*. There are also some original papers by the Editor, viz., *Geometria Fluxionum*; *Logistica Infinitorum*; *De Viribus Centralibus*, etc.

- 12498 ——— OPERA, EDITIO COLLECTIVA; with numerous plates, tables, and diagrams, 8 vols. 4to. uniformly bound in russet gilt, g. e. (a few joints neatly mended, but a FINE SET), £2. 12s 6d 1744-61  
Besides Bp. Horsley's edition above, this was the only approximately complete and uniform edition of Newton's works ever issued. It comprises: OPERA MATHEMATICA, PHILOSOPHICA ET PHILOLOGICA, collegit, recensuit, etc. Joh. Castellionius, 3 v., *Lausanne*, '44: PRINCIPIA, studio Thomæ Le Seur et Franc. Jacquier, 3 v., *Coloniæ*, '60; ARITHMETICA UNIVERSALIS, cum Commentariis Joh. Castellionei, 2 v., *Amst.*, '61.
- 12499 ——— OPUSCULA MATHEMATICA PHILOSOPHICA ET PHILOLOGICA, collegit partimque Latinè vertit ac recensuit JOH. CASTILLIONEUS, Jurisconsultus [accessit Commentariolus de Vita Auctoris]; with vignette portrait by Duflos after Delamonce, 64 plates, and 2 folding tables, 3 vols. 4to. hf. vellum, or, hf. calf, 18s 6d *Lausanne*, 1744
- 12500 ——— ANOTHER COPY, contemporary pressed white vellum (fine copy), £1. 1s  
The above work contains: *Analysis per Æquationes*. *Methodus Fluxionum*. *Tractatus de Quadratura Curvarum*. *Enumeratio Linearum Tertii Ordinis*. *Methodus Differentialis*. *Excerpta ex Commercio Epistolari*. *De Mundi Systemate*. *Lectiones Opticæ*. *De Natura Acidarum*, etc. etc. etc.

#### PRINCIPIA:

- 12501 ———: PHILOSOPHIÆ NATURALIS PRINCIPIA MATHEMATICA. Auctore IS. NEWTON, Trin. Coll. Cantab. Soc. Matheseos Professore Lucasiano, & Societatis Regalis Sodali. Imprimatur. S. PEPYS, Reg. Soc. Præs. Julii 5. 1686, editio princeps; with folding plate, and numerous diagrams, 4to. old (? contemporary) calf, newly and very neatly rebaked, with auto. 'J. C. Willisford, August 1828' on title, (blank top margins of some ll. water-stained, and a very small hole in one page, otherwise a SOUND AND LARGE COPY, measuring  $9\frac{1}{16} \times 7\frac{1}{2}$  inches), excessively rare, £18. 18s Londini, Jussu Societatis Regiæ ac Typis Josephi Streater. Prostat apud plures Bibliopolas. Anno MDCLXXXVII.

THE ABOVE IS THE FIRST ISSUE OF THE FIRST EDITION. A re-issue was published in the same year with a new title, having a different imprint. This second issue is somewhat less rare than the above, although copies of either are now practically unprocurable. No copies of either can be traced as having sold at auction during the last twenty years.

The interest of the first edition of what probably constitutes the most important printed work on exact science ever published need hardly be emphasised. It should also be noted that the first edition has never been reprinted in any form.

The cost of printing the first edition was borne by EDMUND HALLEY, F.R.S., who edited and saw it through the press, and added the Latin verses reprinted in all the later editions. The idea of Mr. Samuel Pepys, F.R.S. giving the Society's imprinter to Newton's *Principia* is tickling.

Owing to the importance of the work and the comparatively small number of copies printed, the first edition became rare almost immediately after publication. Sir David Brewster, in his *Life of Newton*, mentions (Vol. I, pp. 312 and 337): 'The impression was quickly sold. A copy of the *Principia* could scarcely be procured in 1691. . . . Cotes states in his preface to the second edition that copies of the first were scarce, and could only be obtained at an immense price. Sir William Browne, when at college, gave more than two guineas for a copy, and owing to the difficulty of procuring one at a reasonable price, the father of Dr. John Moore of Glasgow transcribed the whole work with his own hand.'



## PRINCIPIA, continued:—

- 12503 **NEWTON** (Sir Isaac, P.R.S.) PHILOSOPHÆ NATURALIS PRINCIPIA MATHEMATICA; EDITIO SECUNDA, auctor et emendator; with folding plate, and numerous diagrams, 4to. sound and very clean copy in old calf (RARE), £1. 15s  
This copy bears the autograph while at Gains College of SAMUEL SHUCKFORD, afterwards Prebendary of Canterbury, and author of the 'Connexion of Sacred and Profane History', which had an extraordinary vogue of a hundred years till it was finally edited by James Talboys Wheeler, the historian of India, in 1858.
- 12504 ——— ANOTHER COPY, old calf (binding slightly damaged), £1. 10s
- 12505 ——— THE SAME, hf. calf gilt (title mounted and some ll. inked or stained), £1. 5s  
This edition contains considerable additions by the AUTHOR, while the chapters on the lunar theory and the theory of comets were much enlarged. It was edited by ROGER COTES, F.R.S., whose preface (pp. 16), in which he vigorously attacks the Cartesian philosophy then still in vogue at the universities, and refutes an assertion that Newton's theory of attraction is a *causa occulta*, is of great historical importance. It also contains a new preface by the author, the Latin verses on him by EDMUND HALLEY, the Astronomer Royal, and an 'Index Capitulum' and 'Index Rerum Alphabeticus' at end, both by the Editor. Seven hundred and fifty copies were printed of this edition, which has now also become RARE.
- 12506 ——— EDITIO SECUNDA REIMPRESSIO AMSTÆLODAMENSIS [in titulo:] Editio Ultima, auctor et emendator; with folding plate and numerous diagrams, 4to. old calf (back of binding damaged, and last 18 ll. water-stained), 15s  
Amst., sumptibus Societatis, 1714  
The first Amsterdam reprint of the second edition. It was reprinted in 1723 with the addition of 'Analysis per Quantitatum Series'.
- 12507 ——— EDITIO TERTIA [ET ULTIMA], aucta et emendata; with numerous diagrams, 4to. sound copy in contemporary panelled calf (portrait wanting), with bookplate of Earle Bulwer [Sir Henry Bulwer, Lord Dalling, Ambassador at Washington, and concluder of the Clayton-Bulwer Treaty], £1. 1s  
Londini, Guil. & Joh. Innyss, 1726
- 12508 ——— ANOTHER COPY, with portrait by G. Vertue, sound copy in old calf, newly rebacked, with auto. of Samuel Roberts, F.R.S., 18s 6d
- 12509 ——— ANOTHER COPY, old calf (joints broken and portrait wanting), 12s 6d
- 12510 ——— A Largest Paper Copy, printed on thick paper, with portrait at. 83 by G. Vertue after Vanderbank, folio, contemporary russia extra (back badly rubbed and slightly damaged, and joints cracked), g. e., with label of George Kennie, F.R.S. (very rare), £3. 10s  
Less than 20 copies were printed of this edition, all of which were reserved for presentation.  
\* This edition, the last published during the author's life-time, and the one on which all subsequent ones are based, was edited by HENRY PEMBERTON, M.D., F.R.S., and contains a new preface by Newton, and a large number of alterations, the most important being the scholium on fluxions, and the addition of a new one on the motion of the moon's nodes, to which I may add an account of some additional experiments on the resistance of the air to bodies falling through it, and the use of some fresh astronomical observations in book III.—W. W. R. Ball. It also contains Halley's verses and Cotes's preface.  
\* Newton modified in the third edition of the *Principia* the scholium relating to fluxions, in which Leibnitz had been mentioned by name. Leibnitz and his friends had always held this scholium to be an acknowledgment of his claim to originality.—Dr. R. T. Glazebrook, F.R.S. See in this connexion note to No. 12570, post.
- 12511 ——— REPR. OF THE THIRD EDITION, reprinted for SIR WILLIAM THOMSON [LORD KELVIN, P.R.S.] and HUGH BLACKBURN, Professors of Natural Philosophy and Mathematics in the University of Glasgow, with fs. title and numerous diagrams, 4to. cl. (SCARCE), £1. 5s  
Glasgow, 1871  
\* Finding that all the Editions of the *Principia* are now out of print, we have been induced to reprint Newton's last Edition without note or comment, only introducing the 'Corrigenda' of the old copy and correcting typographical errors. W. T. H. B.—Notice. This reprint contains besides the author's prefaces to the three editions, the valuable introduction to the second edition by Roger Cotes, and the Latin verses by Edmund Halley.
- 12512 ——— EDITIO NOVA, perpetuis Commentariis illustrata, communi Studio PP. THOMÆ LE SEUR et FRANCISCI JACQUIER, Ord. Min.; with vignettes, and numerous diagrams, 3 vols. 4to. in 4.  
sound copy in contemporary calf gilt, £1. 5s  
Genevæ, 1739-42  
THE FIRST so-called 'JESUITS' EDITION,' much valued for its copious commentary. 'Le professeur Calandrini, à Genève, a été l'éditeur de cet excellent commentaire et l'a enrichi de notes, de citations et de démonstrations.'—Brunet.  
The above edition also contains in v. III the following important pieces, which gained the prize of the French Academy: *Traité sur le Flux et Reflux de la Mer*, par DANIEL BERNOULLI (pp. 133-246); *De Causa Physica Fluxus et Refluxus Maris* a COLIN MACLAURIN, S.R.S. (pp. 247-82); *Inquisitio Physica in Causam Fluxus et R-fluxus Maris* a LEONARDO EULER (pp. 283-374). According to Mr. W. W. R. Ball, 'these three memoirs contain all that was done on the theory of tides before the publication of Newton's *Principia* and the investigations of Laplace.  
The text of the *Principia* is that of the third Edition.
- 12513 ——— EDITIO ALTERA, longè accuratior et emendator; with numerous diagrams, 3 vols. 4to.  
old calf gilt (a few joints cracked), 18s 6d  
Colonie Allobrogum, 1760  
The second 'Jesuits' Edition,' being a reprint of the first with corrections, and the memoirs on the theory of tides, but without Halley's verses.
- 12514 ——— ANOTHER COPY, 3 vols. in 4, old calf (joints broken), with numerous MS. notes in a contemporary hand, 14s
- 12515 ——— EDITIO NOVA, summa Cura recensita; with numerous diagrams, 2 vols. impl. 8vo. hf. calf (joints cracked), 12s  
Glasgow, 1833  
The last and best of the 'Jesuits' Editions,' edited by JOHN M. F. WRIGHT, containing all the prefaces to the first three editions, as well as the memoirs on the tides. 'Edition belle et soignée.'—Brunet.
- 12516 ——— THE MATHEMATICAL PRINCIPLES OF NATURAL PHILOSOPHY, translated by ANDREW MOTTE; with the LAWS OF THE MOON'S MOTION, according to Gravity, by JOHN MACHIN, F.R.S., with fronts., and vignettes by the Translator, and 47 folding plates, 2 vols. 8vo. old calf, 15s  
Benjamin Motte, 1729
- 12517 ——— ANOTHER COPY, 2 vols. old calf (fronts. wanting, binding not uniform and that of v. I damaged, also wanting fronts.), 10s  
First edition of the first English translation of the *Principia*, 'handsomely printed', and 'a highly creditable productio n.'—D. N. E.

## PRINCIPIA, continued:—

- 12519 **NEWTON** (Sir Isaac, P.R.S.) **THE MATHEMATICAL PRINCIPLES OF NATURAL PHILOSOPHY**; new Edition, with Newton's **SYSTEM OF THE WORLD**; a short Comment on, and Defence of, the Principia, by W. EMERSON; and **LIFE**, carefully revised and corrected by WILLIAM DAVIS, with fine bust portrait by Scriven, and 54 folding plates, besides diagrams, 3 vols. 8vo. old calf, or, hf. cl. (RARE), £1. 5s 1803
- 12520 ——— **ANOTHER COPY**, 3 vols. in 1, hf. calf, £1. 4s
- 12521 ——— **ANOTHER COPY**, 3 vols. mottled calf extra (name cut off titles, but FINE COPY), £1. 10s  
This edition contains for the first time the translation of the *De Mundi Systemate*, which was not contained in the edition of 1729.  
'The inconvenience arising from the great scarcity of former editions of the Principia, and System of the World, added to the exorbitant prices charged for them when to be met with, determined the Editor to undertake a New Edition of those Works.'—*Præface*.
- 12522 ——— **REPRINT OF THE ABOVE EDITION**, with fine bust portrait by Scriven, and 54 folding plates, 3 vols. 8vo. old hf. calf (a few joints cracked), £1. 1s 1819
- 12523 ——— **MATHEMATICAL PRINCIPLES OF NATURAL PHILOSOPHY, BOOK I** [Motion of Bodies], translated, and illustrated with a Commentary, by ROBERT THORP, D.D., Archdn. of Northumberland; 2nd Edition, with 22 plates, roy. 4to. russia extra, g. e., with booklabel of George Rennie, F.R.S. (fine and large copy), 12s 6d 1802
- 12524 ——— **ANOTHER COPY, boards, uncut**, 10s 6d  
This translator was a member of Peterhouse, and Senior Wrangler in 1758. His Son CHARLES, pr., was the first Warden of Durham University. The above translation includes Newton's Prefaces, and Cotes's to the second Edition, and an Introduction (pp. 18) by himself.  
'Newton is the new Archimedes, and the Principia forms the Novum Organum of scientific method. . . . There is hardly a progressive branch of physical and mathematical science, excepting perhaps chemistry and electricity, which has not been developed from the germs of true scientific procedure which he disclosed in the Principia and Opticks.'—*Prof. W. S. Jevons, F.R.S.*
- 12525 ——— **THE FIRST THREE SECTIONS**, with copious Notes and Illustrations, and a great Variety of Deductions and Problems, by JOHN CARR, pr., Fellow of Trinity, with 6 folding plates, 8vo. cl., with auto. of C. F. Mackenzie, first Bp. of the Universities' Mission to Central Africa, 2s 6d 1821
- 12526 ——— **SECOND EDITION**, improved and enlarged, with 6 folding plates, 8vo. hf. cl., 3s 1825
- 12527 ——— **THE FIRST THREE SECTIONS** and Part of the SEVENTH, with Preface recommending a Geometrical Course of Mathematical Reading, and Introduction on the Atomic Constitution of Matter, and the Laws of Motion, by GEORGE LEIGH COOKE, pr., with 54 diagrams, 8vo. cl., 4s Oxford, 1850
- 12528 ——— **THE FIRST THREE SECTIONS**, with Appendix, and the IX. and XI. SECTIONS, edited by JOHN H. EVANS, Master of Sedbergh School, 2nd Edition, with diagrams, 8vo. hf. cl., 2s Cambridge, 1838
- 12529 ——— **FIFTH EDITION**, by P. T. MAIN, with diagrams, 12mo. cl., 2s ibidem, 1871
- 12530 ——— **SECTIONS I. II. III.**, with Notes and Illustrations, also Problems, principally intended as Examples of Newton's Methods, by PERCIVAL FROST; pr., F.R.S., with diagrams, post 8vo. cl., 3s ib., 1854
- 12531 ——— [SECOND EDITION, enlarged], with diagrams, 8vo. cl., 4s 6d ib., 1863
- 12532 ——— [THIRD EDITION], with diagrams, 8vo. cl. (cover slightly soiled), with auto. of Samuel Roberts, F.R.S., 5s 1880
- 12533 ——— **FOURTH [LAST] EDITION**, with diagrams, 8vo. cl., 6s 6d (p. 12s) 1883

## OPTICS:

- 12534 [——] **OPTICKS: or a Treatise of the Reflexions, Refractions, Inflexions and Colours of Light**; also TWO TREATISES on the Species and Magnitude of CURVILINEAR FIGURES, first edition, with 19 folding plates, 4to. hf. calf antique (VERY RARE), £2. 2s  
S. Smith and B. Walford, Printers to the Royal Society, 1704
- 12535 ——— **ANOTHER COPY**, contemporary panelled calf (joints cracked, but a large and sound copy), with auto. 'Isaac Newton' on endpaper, £3. 15s
- 12536 ——— **THE SAME, A FINE COPY IN CONTEMPORARY ENGLISH RED MOROCCO EXTRA**, Harleian gold tooling on sides, g. e., £4. 4s  
The above work is one of the great classics of optics. It expounds Newton's corpuscular or emission theory of light, and first contains his important optical discoveries in a collected form. The above first edition also contains two important mathematical treatises left out in the later ones, viz., 'Enumeratio Linearum III. Ordinis', and 'Tractatus de Quadratura Curvarum', containing his invention of the 'fluxional' calculus. They were here published for the first time, especially with a view to assert Newton's rights to the discovery of the calculus (of which the controversy with Leibniz was then just preparing). In his introduction to the *Tractatus* he states that he had invented the 'method' in 1665-6—thus claiming priority over Leibniz. According to the *Advertisement*, 'the ensuing discourse was written at the desire of some Gentlemen of the Royal Society, in 1675. He reveals therein also his peculiarity of shrinking from every kind of publicity, when he complains that he had delayed the printing 'to avoid being engaged in disputes about these matters'.  
The last passage of the *Advertisement* is of importance in connexion with the Newton-Leibniz controversy: 'In a Letter written to Mr. Leibnitz in 1676 . . . I mentioned a Method by which I had found some general Theorems about squaring curvilinear Figures . . . And some Years ago I lent out a Manuscript containing such Theorems, and having since met with some Things copied out of it, I have on this Occasion made it publick'.
- 12537 ——— **ANOTHER COPY**, without the Two Mathematical Treatises, with 12 folding plates, 4to. old calf (joints cracked), £1. 5s [1704]  
The above consists of the optical part only, with a new title, without date, place, or printer's name, but giving the author's name. This issue seems to be rare, no mention being made of it in bibliographies.

OPTICS, continued:—

Sir Isaac Newton's own corrected copy:

- 12539 NEWTON (Sir Isaac, P.R.S.) OPTICKS, SECOND [FIRST OCTAVO] EDITION, with Additions, with 12 folding plates, 8vo. old calf, joints neatly mended (FINE COPY); with MS. corrections in Sir Isaac Newton's handwriting, £25.

A. Bowyer for W. Innys, 1717

The original issue of the second edition, and printed on strong paper. It is rare thus, most copies being of the second issue of 1718. The mathematical tracts were left out in this and the following editions.

The above copy is of great interest for having belonged to Sir Isaac Newton himself, who has made additions and corrections (all verified to be in his handwriting), which were wholly or partly adopted in the later editions of the 'Opticks'. They are: on page 70, line 20:  $\frac{MC^2}{NG^4}$  is altered

into  $\frac{AD}{EP}$  (this correction was made in the 3rd Edition). Page 230, line 19:  $\frac{16\frac{1}{2}}{10000}$  is altered in text and written out on margin:  $\frac{9\frac{1}{2}}{100000}$  (corrected in the 3rd Edition). Page 271, line 14: after 'plainest' is added on margin: 'upon the

Chart, & removing the chart' (alteration not adopted). Page 275, line 15: after 'second' is added on margin: 'without quicksilver in the same angle' (addition not adopted). Page 334, line 11-12: The passage: 'that side of the same Ray which looks towards' is struck out (correction not adopted). Page 342, line 6: after 'Earth' is added on margin 'or 73'; line 8: 14 is altered in text into 15 $\frac{1}{2}$ , and on margin into 16 $\frac{1}{2}$ ; line 10: '21, 28 or 35' is altered in text into '22, 30 $\frac{1}{2}$ , 35 $\frac{1}{2}$ ', and on margin into '23, 30 $\frac{1}{2}$ , 38 $\frac{1}{2}$ '; lines 12 and 13: '70, 140, 210', is altered in text into '76 $\frac{1}{2}$ , 153 $\frac{1}{2}$ , 230', and on margin into '80, 160, 238' (corrections adopted slightly modified in the 4th Edition). Page 366, line 22: 'height' is struck out, and 'distance' substituted for it on margin (correction made in the 4th Edition). Page 382, line 4: after 'Benefactor' is added: 'as their ancestors did before they corrupted themselves. For the seven Precepts of the Noachides were originally the moral Law of all nations; & the first of them was to have but one supreme Lord God & not to alienate his worship; the second was not to profane his name; & the rest were to abstain from blood or homicide & from fornication (that is from incest adultery & all unlawful lusts,) & from theft & all injuries, & to be merciful even to brut beasts, & to set up magistrates for putting these laws in execution. Whence came the moral Philosophy of the ancient Greeks' (partly adopted in the third Edition, by adding after 'Benefactor': 'as their Ancestors did under the Government of Noah and his Sons before they corrupted themselves').

- 12540 — SECOND ISSUE OF THE SECOND EDITION, with 12 folding plates, 8vo. old calf, or, old calf, rebacked, 12s 6d  
W. and J. Innys, 1718

In this edition the number of queries at the end of the work is increased from 16 to 31, including the celebrated one (No. 28): 'Are not all hypotheses erroneous in which Light is supposed to consist in pression or motion propagated through a fluid medium? . . . If it consisted in pression or in motion propagated either in an instant or in time, it would bend into the shadow. For pression and motion cannot be propagated in a fluid in right lines beyond an obstacle which stops part of the motion, but will bend and spread every way in the quiescent medium which lies beyond the shadow.' Query 17 discusses the double refraction of Iceland spar. It also contains a new and interesting preface.

'At the end of the 3rd book I have added some Questions. And to shew that I do not take Gravity for an essential Property of Bodies, I have added one Question concerning its Cause, chusing to propose it by way of a Question, because I am not yet satisfied about it for want of Experiments.'—Advertisement II.

- 12541 — THIRD EDITION, corrected, with 12 folding plates, 8vo. old calf, or, old calf, neatly rebacked, 12s  
apud eosdem, 1721

This is a literal reprint of the foregoing edition, save for a few corrections and the addition of one passage in the last sentence in the work referring to Noah and his sons, as pointed out in the note to Newton's annotated copy of the second edition (No. 12539, *supra*).

- 12542 — FOURTH [FINAL] EDITION, corrected, with 12 folding plates, 8vo. old calf, or, old calf, newly rebacked (RARE), 17s 6d  
William Innys, 1730

This was the last edition revised by the Author. 'It was corrected by the Author's own hand, and left before his Death with the Bookseller. . . . It has been thought proper to make at the bottom of the Pages several Citations from thence [Lectiones Opticæ], where may be found the Demonstrations, which the Author omitted in these Opticks'.—Advertisement to this Fourth Edition.

- 12543 — OPTICE: sive de Reflexionibus, Refractionibus, Inflexionibus et Coloribus Lucis Libri III, Latine reddidit SAMUEL CLARKE, A.M.; accedunt Tractatus II ejusdem Authoris de SPECIEBUS et MAGNITUDE FIGURARUM CURVILINEARUM; with 19 folding plates, 4to. contemporary calf, newly rebacked (sound and clean copy); RARE, £1. 5s Londini, S. Smith & B. Walford, 1706

- 12544 — ANOTHER COPY, old panelled calf (joints cracked, and title and some ll. somewhat stained), 18s 6d

THE FIRST LATIN EDITION, translated by Newton's disciple DR. SAMUEL CLARKE, afterwards Rector of St. James's, Westminster, whose alleged Arianism gave rise to so long a controversy. It was the first edition to contain Newton's views on the double refraction of Iceland spar, and included six more queries than the English Edition of 1704. It contains for the first time the celebrated one [No. 28] on the nature of light (*c. note to No. 12540, supra*). The translator received £500. from Newton for his work.

- 12545 — EDITIO SECUNDA, auctior; with 12 folding plates, 8vo. old calf (binding damaged), 6s  
*ibidem*, Gul. & Joh. Innys, 1719

- 12546 — A LARGE PAPER COPY, 4to. old calf, newly rebacked, 10s 6d  
Neither this nor the later editions contain the two mathematical treatises included in the edition of 1706. The queries however are extended from 22 to 30.

- 12547 — EDITIO NOVISSIMA [TERTIA]; with vignette on title, and 12 folding plates, 4to. old calf gilt (some ll. browned), 8s 6d  
Lausanne, 1740

This edition has a dedication to Jean Bernoulli by the publisher, and is valuable for a copious index which it contains.

TRANSLATED BY MARAT:

- 12548 — OPTIQUE de NEWTON, Traduction Nouvelle, faite par M\*\*\* [JEAN PAUL MARAT; 'L'Ami du Peuple'] sur la dernière Edition originale. Dediée au Roi [avec Préface], par M. BEAUZÉE, Editeur de cet Ouvrage, l'un des Quarante de l'Académie Française, etc. etc.; with 21 folding plates, 2 vols. 8vo. old hf. calf (binding rubbed, but a sound and clean copy); RARE, £1. 5s  
1787

## OPTICS, continued:—

- 12550 **NEWTON (Sir Isaac, P.R.S.):** OPTIQUE de NEWTON: ANOTHER COPY of MARAT'S TRANSLATION (as fully described in No. 12548), 2 vols. 8vo. HANDSOMELY BOUND in CONTEMPORARY FRENCH CRIMSON MOROCCO EXTRA, hand-tooled backs, silken linings and flyleaves, g. e., by DERÔME (A VERY FINE COPY), £4. 4s

This, like all the other works of this monster of the Terror, is very rare (r. Nos. 11385-91, *ante*). The 'Opticks' were previously translated into French by Pierre Coste in 1725, and reprinted in 1722. This translation appears however to have been very unsatisfactory, for the editor characterizes it as 'défectueuse, infidèle et obscure, servile et barbare'. Marat's translation is by no means a literal one, and should be of special interest, as it was Marat who first, in France, dared to attack Newton's corpuscular theory.

Marat's translation was apparently unknown to Sir David Brewster, as he only mentions that of P. Coste.

- 12551 ——— **LECTIONES OPTICÆ, Annis MDCLXIX ad MDCLXXI, in Scholis Publicis habitæ: et nunc primum ex MSS. in Lucem editæ, editio princeps; with 24 folding plates, 4to. sewn, uncut (sound copy); RARE, £1. 1s**  
*Londini, Guil. Innys, 1729*

- 12552 ——— **ANOTHER COPY, old vellum (fine copy), £1. 5s**

- 12553 ——— **ANOTHER COPY, contemporary calf, newly rebounded, £1. 4s**

Consisting of two parts, 'de radiorum lucis refractionibus', and 'de colorum origine'. Only the first part was translated into English.

Before the end of 1669 he had worked out the details of his discovery of the decomposition of a ray of white light into rays of different colours by means of a prism. The complete explanation of the theory of the rainbow followed from this discovery. These discoveries formed the subject matter of the lectures which he delivered as Lucasian professor from 1669 to 1671. . . . The MS of his original lectures was printed in 1729 under the title *Lectioes Opticæ*.—*W. W. R. Ball.*

'This valuable work contains many beautiful propositions, and interesting and instructive experiments, which are not to be met with in any modern treatise on optics.'—*Sir David Brewster, F.R.S.*

## ARITHMETICA UNIVERSALIS:

- 12554 [——] **ARITHMETICA UNIVERSALIS; sive de Compositione et Resolutione Arithmetica Liber, cui accessit HALLEIANA ÆQUATIONUM RADICES arithmetice inveniendi METHODUS, editio princeps; with numerous diagrams, sm. 8vo. contemporary calf (joints neatly mended, otherwise a FINE COPY), with inser. 'E Libris B: Baker Sanc: Trin: Coll: Cant. Alumni, 1707' on flyleaf, and bookplate of John Kentish (Unitarian); RARE, £1. 10s**  
*Cantabrigiæ, 1707*

- 12555 ——— **ANOTHER COPY, old hf. calf gilt, £1. 8s 6d**

- 12556 ——— **ANOTHER COPY, contemporary panelled calf gilt (VERY SOUND AND FRESH COPY), with old engraved bookplate of John Peyto Verney, Lord Willoughby de Broke, £1. 12s 6d**

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*Londini, Typis Pearsonianis, 1712*

This is the celebrated report drawn up by order of the Royal Society, and consisting of a selection from the correspondence of John Collins, F.R.S. with some of the most celebrated mathematicians of the time, which substantiated Keill's charge against Leibniz of having derived the fundamental ideas of his calculus from papers by Newton, said to have been communicated to him through Collins and Oldenburg.

Although greatly biased in Newton's favour, the work is nevertheless 'a repository of the utmost value to the history of science' (*D. N. B.*), and is now excessively rare.

The above is, according to Gray's Bibliography of Newton, THE EARLIEST OF THE TWO ISSUES OF THE FIRST EDITION.

- 12565 ——— **[EDITIO SECUNDA], et jam unâ cum ejusdem Recensione præmissa, et Judicio primarii, ut ferebatur. Mathematici subjuncto, iterum impressum; with diagrams, 8vo. fine and tall copy in old calf gilt (RARE). £1. 12s 6d**  
*ibidem, J. Tonson et J. Watts, 1722*

- 12566 ——— **ANOTHER COPY, cl., with MS. notes by, and bookplate of, Prof. Lloyd Tanner, F.R.S., £1. 10s.**  
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- The second edition, besides being a complete reprint of that of 1712, contains a new address to the reader (pp. 6), a 'Recensio Libri qui inscriptus est Commercium Epistolicum' (pp. 59), an Appendix (pp. 2), and an 'Annotatio' (pp. 4). The address and Recensio were written by NEWTON himself—a fact first announced by Prof. de Morgan, and confirmed by Sir David Brewster. The latter did not know of the edition of 1722, and only mentions (Life of Newton, v. II, p. 75) that 'in the year 1725, a new edition of the Commercium was published.'

- 12569 ——— **EDITIO SECUNDÆ REIMPRESSIO** ; *with diagrams*, 8vo. *old calf (back torn)*, with 10 pp. of MS. Index added (RARE), £1. 12s 6d *ibidem, J. Tonson et J. Watts, 1725*

FIRST ISSUE OF THE 1725 REPRINT, which agrees with that of 1722, but has a new and much fuller title.

- 12570 ——— **SECOND ISSUE OF THE 1725 EDITION** ; *with diagrams*, 8vo. *old hf. calf (one joint cracked)* ; VERY RARE, £2. 2s *ib., apud eosdem, 1725*

This was the last issue of the last edition published (save for the French reprint), and is of great interest for a cancellation in Newton's preface. In all the previous issues of the 1722 and 1725 editions occurs the passage: 'Quæ novæ Principiorum editioni præmissa sunt, Newtonus non vidit antequam Liber in lucem prodiret. Quæ de Quæstionibus Philosophicis disputata sunt D. Des Maizeaux a D. Leibnitio et aliis accepit et in lucem edidit,' with a note referring to Leibniz's letters to Des Maizeaux. In the above issue however the passage 'a. D. Leibnitio et aliis accepit' and the note is cancelled. This was probably done at the time when Newton decided to leave out of the third Edition of 1726 the Scholium referring to Leibniz (*vide note to No. 12510*).

'It is due to historical truth to state, that Newton supplied all the materials for the *Commercium Epistolicum*, and that, though Keill was its editor, and the committee of the Royal Society the authors of the Report, Newton was virtually responsible for its contents.'—*Sir David Brewster*.

- 12571 ——— **COMMERCIIUM EPISTOLICUM . . . ou CORRESPONDANCE de J. Collins et d'autres Savants célèbres du XVII<sup>e</sup> Siècle relative à l'ANALYSE SUPÉRIEURE**, réimprimée sur l'Édition Originale de 1712, avec l'Indication des Variantes de l'Édition de 1722, complétée par une COLLECTION de PIÈCES JUSTIFICATIVES et de DOCUMENTS, et publiée par J. B. BIOT et F. LEFORT ; *with diagrams*, 4to. *hf. calf*, 10s (p. F. 15 nett sewn) 1856

The 'pièces justificatives' are letters that seemed to support Leibniz's claims in the opinion of the editors, as well as excerpts from Cavalieri, Descartes, Fermat, Hudde, Ricci, Barrow, and Sluze, which ultimately led to the discovery of the infinitesimal calculus. At end is a chapter by Lefort (pp. 2) : 'Caractère des publications du Commercium Epistolicum faites en 1712 et en 1722, etc. etc.'

## MINOR WORKS :

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- 12578 ——— : **NEUTONI GENESIS CURVARUM per UMBRAS, seu Perspective Universalis Elementa** ; Exemplis Coni Sectionum et Linearum Tertii Ordinis illustrata [curâ PATRICII MURDOCH, D.D.] ; *with 12 folding plates*, 8vo. *old calf*. 7s 6d *Londini, 1748*

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*H. Wallisford August 1828.*

PHILOSOPHIÆ  
NATURALIS  
PRINCIPIA  
MATHEMATICA.

Autore *J. S. NEWTON*, *Trin. Coll. Cantab. Soc. Matheseos*  
*Professore Lucasiano, & Societatis Regalis Sodali.*

IMPRIMATUR.  
S. PEPYS, *Reg. Soc. PRÆSES.*  
*Julii 5. 1686.*

LONDINI,  
*Jussu Societatis Regie ac Typis Josephi Streater. Prostat apud*  
*plures Bibliopolas. Anno MDCLXXXVII.*

*No. 110 No. 110*

No. 12501 (page 621).

First issue of the first edition of the greatest work on exact science  
ever published.



instead of teaching the Transmigration of Souls, and to worship the Sun and Moon, and dead Heroes, they would have taught us to worship our true Author and Benefactor, as their ancestors did before they corrupted themselves. For the seven Precepts of the Noachides were originally the moral law of all nations, & the first of them was to have but one supreme Lord God & not to alienate his worship; the second was not to I <sup>use</sup> <sup>his</sup> name; & the rest were to abstain from fornication (that is from incest adultery & all unlawfull lusts,) & from homicide, theft & all injuries, & to be merciful even to brute beasts, & to set up <sup>for</sup> magistrates for putting these laws in execution. Whence came the morals <sup>of the</sup> Philosophy of the Greeks.



No. 12539 (page 624).

Newton's autograph.

## MINOR WORKS, continued:—

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Buffon's translation (the translator was unknown to Barbier) was made from Colson's English translation, but contains neither his preface nor the commentary. It includes however a very interesting preface by Buffon himself (pp. 28), in which he maintains, in opposition to the opinion of the majority of the mathematicians of his own country, that Newton is the sole and only inventor of the calculus ('on demeura convaincu que Newton seul est l'auteur de ces merveilleux calculs' [p. VI of preface]).
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*This seems to be a very rare edition, that of 1731 being generally considered the first Latin one. The latter only is mentioned in Gray's 'Bibliography of Newton.'*  
Prof. de Morgan's doubts as to Newton's authorship of this work were dispelled by Edleston in his *Correspondence*. It was originally meant to form the third book of the *Principia*.
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*Univ. Press, Cambridge, 1888*  
This is the great mass of Newton's papers which came at his death into the hands of Mr. Conduitt, who married Catherine Barton, Newton's niece, and eventually into those of Lord Portsmouth at Hurstbourne. They were inspected and ignored by Bp. Horsley, and but little used by Sir David Brewster.  
The above valuable volume has preface and appendix to preface by H. R. LUARD, PR., SIR G. GABRIEL STOKES, J. COUCH ADAMS, and G. D. LIVEING, F.R.S.

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'He allowed to Sir Isaac the great merit of having settled laws and rules in natural philosophy; but at the same time claimed for Mr. Hutchinson the discovery of the true physiological causes by which, under the power of the Creator, the natural world is moved and directed.—William Jones (of Nayland), pp., F.R.S.
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- *v. Nos. 11220-2, ante*.
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Not mentioned in Gray's bibliography of Newton.  
The author was a Platearther unbudgeted by Professor de Morgan.  
'Locke, Condillac et leurs disciples devinrent aussi le sujet de ses attaques; par un mauvais jeu de mots, il les appela les idiots rognés, idiologues. Les découvertes physiques ne lui inspiraient pas plus de respect: il attaqua même le système astronomique de Kopernik et de Newton, prétendant que la Terre est ronde et plate et que le Soleil tourne autour de ce plateau comme un cheval de manège.—Biogr. Gén.
- 12613 **NEWTON et LEIBNITZ** [in French, English, and German], folio (pp. 3), *unbound (very rare)*, 7s 6d Pau, 1863  
In this interesting letter, which was sent out to 1500 scientists, the anonymous author offers 250 francs for the publication of a certain passage in a Leibniz MS. (referred to by Dr. H. Stoman, but said to have been purposely left out in Gerhardt's edition, and since then disappeared altogether from its home in the Royal Library of Hanover), which would conclusively prove that Leibniz borrowed his differential calculus from a Manuscript by Sir Isaac Newton.

COMMERCIIUM

# EPISTOLICUM

D. JOHANNIS COLLINS,

ET ALIORUM

DE

# ANALYSI

PROMOTA:

JUSSU

# SOCIETATIS REGIÆ

In lucem editum.



LONDINI:

Typis PEARSONIANIS, Anno M DCC XII.

A D

# LECTOREM.

**Q**UAM ob causam editæ sint hæc Epistole Chæritative collectaneæ, apparebit ex Literis D. Leibnitii & D. Keillii in fine subscriptis. Offensionem attulerant D. Leibnitio nonnulli, quæ scripto prodidit D. Keillius in Actis Londinensibus anno 1708, insuriam D. Newtono oblatam propulsiam. Datis igitur ad Societatis Regiæ Secretarium literis, de calumniis quæsus D. Leibnitius, remedium a Societate petitis; itaque eos equum creditis iudicaturess, ut D. Keillius culpam suam publicè faceret. D. Keillio et est pars visa potior, ut ad illa, quæ quæsus erat D. Leibnitius, literis scriptis responderet: Quibus in literis quæ antè editæ fuerat, sibi factum arbitratus, literas dicitur ad Societatem edidit; in quibus ab hac de D. Keillio quæsus, novum eum hominem appellat, parumque peritum rerum antea factarum cognitorum, nec mandatum ab eo, cuius intercellit, habentem; Societatisq; acquitati committit, annon coercendæ sint vanæ & iniustæ vociferationes.

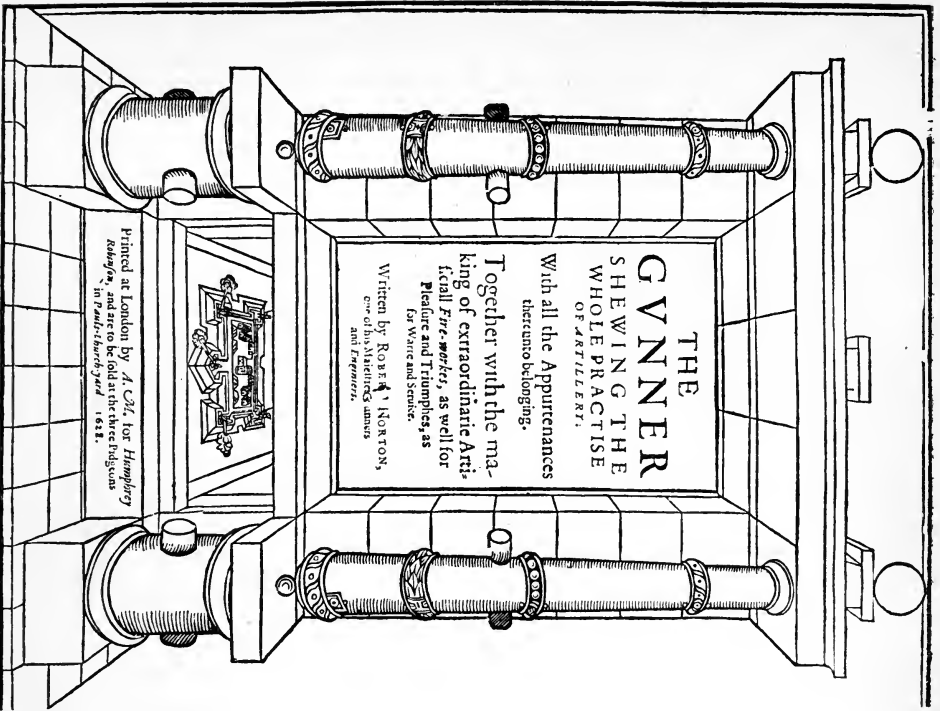
Verabatur in Angliâ D. Leibnitius inveniæ anno 1673, iterumq; mensè Octobri 1676; & interjecto illo temporis intervallo in Galliâ egit. Quo omni temporis spatio, manus accepit datiq; literis, commercium habuit cum D. Oldenburgo, & Oldenburgo, operâ, cum D. Colliño itidem, & nonnunquam etiam cum D. Newtono. Quâd autem ille ex Angliâ tandem, vel tum cum Londini esset, vel ex literis sibi mutatis datis, edidisset, in eo serè certissimè hæc omnis quæsusio. D. Oldenburgus & Collinius jam illi obtulerunt; D. Newtonus autem tum Cantabrigiæ egit; peritumq; amplius novit, quam quod ex literis ipsius a D. Wallisio deinceps editis apparuit. D. Newtonus neque a D. Keillio paribus Testis esse potest, nec D. Leibnitius ipse a suis: Alia autem in cæcis Testis est nullus. Societas itaq; Regiæ, a D. Leibnitio his ad-

A Table of the Contents.

	Page
<b>D</b> efinitions	1
<i>See</i> <i>Exercises</i>	2
<i>See</i> <i>Traverses</i>	3
<i>See</i> <i>Artillery</i>	5
<i>See</i> <i>Perfille for Highball, Breakball, Di-</i>	17
<i>See</i> <i>ances, and description by Plat.</i>	23
<i>See</i> <i>Chap. 1. Of the general definition of Ar-</i>	30
<i>See</i> <i>tillery.</i>	35
<i>See</i> <i>Chap. 2. Of the first invention of Gunns</i>	37
<i>See</i> <i>and Gunpowder</i>	40
<i>See</i> <i>Chap. 3. Where Ordnance were first used</i>	40
<i>See</i> <i>in half parts,</i>	41
<i>See</i> <i>Chap. 4. Of what formes and fashions Or-</i>	41
<i>See</i> <i>dinance were first made.</i>	41
<i>See</i> <i>Chap. 5. Of formes, fortresse, foundings of</i>	42
<i>See</i> <i>Ordnance, and of French Ordnance.</i>	42
<i>See</i> <i>Chap. 6. Of founding, legitimate Ordnance,</i>	44
<i>See</i> <i>with a Tullie and Traverses Ordnance</i>	44
<i>See</i> <i>Chap. 8. Of Boford and Travers with their T-</i>	44
<i>See</i> <i>tie of Quems, Waights, and Measures</i>	44
<i>See</i> <i>Chap. 9. Of extraordinary Pieces and a</i>	46
<i>See</i> <i>Tullie of these Names, Wyghes and Me-</i>	46
<i>See</i> <a href="#">fices, and of the Drakes, and their inven-</a>	46
<i>See</i> <a href="#">tion.</a>	46
<i>See</i> <i>Chap. 10. Of English Ordnance adjuyng-</i>	46
<i>See</i> <i>ing more a Tullie, and howe and fortis,</i>	46
<i>See</i> <i>beginninge, and the Canon</i>	51
<i>See</i> <i>Chap. 11. Of the Capion of Batteries in</i>	51
<i>See</i> <i>particulars, or of the fash kinds, and the</i>	54
<i>See</i> <i>fortis thereof.</i>	54
<i>See</i> <i>Chap. 12. Of Calvering the second kind,</i>	54
<i>See</i> <i>and the fort thereof.</i>	54
<i>See</i> <i>Chap. 13. Of Cannon Terror the third kind</i>	57
<i>See</i> <i>and their fortis.</i>	57
<i>See</i> <i>Chap. 14. Of Cannon the fourth kind, and the</i>	59
<i>See</i> <i>square Cannon Fortis.</i>	59
<i>See</i> <i>Chap. 15. Of several wayes to prevent a</i>	64
<i>See</i> <i>Perilous.</i>	64
<i>See</i> <i>Chap. 16. With what Inventiones to break</i>	64
<i>See</i> <i>Palisades, Grates, Perilous.</i>	65
<i>See</i> <i>Chap. 17. To adjoyne a Piece and borch,</i>	66
<i>See</i> <i>Chap. 18. Of certain faultes in fortresse</i>	67
<i>See</i> <i>foundings of Ordnance.</i>	67
<i>See</i> <i>Chap. 19. Of the Ligne or Allignment of</i>	69
<i>See</i> <i>Materialls for the Ordnance.</i>	69
<i>See</i> <i>Chap. 20. Of Earthes or Spawders for</i>	70
<i>See</i> <i>Mounds to scuff them.</i>	70
<i>See</i> <i>Chap. 21. Of making Mounds for the fou-</i>	71
<i>See</i> <i>ding of Ordnance.</i>	71
<i>See</i> <i>Chap. 22. Of the Place, Measures, and use</i>	72
<i>See</i> <i>of the Traversins.</i>	72
<i>See</i> <i>Chap. 23. Of Examining if a Piece of Or-</i>	74
<i>See</i> <i>dinance be well made, and of what kinde and</i>	74
<i>See</i> <i>fortis it is.</i>	74
<i>See</i> <i>Chap. 24. Of certain Ordnance, and finde</i>	77
<i>See</i> <i>what Powder they containe.</i>	77
<i>See</i> <i>Chap. 25. To finde if her Sank by in the</i>	83
<i>See</i> <i>middle of her Body.</i>	83
<i>See</i> <i>Chap. 26. To adjoyne a Piece whole Sank</i>	84
<i>See</i> <i>by the Horizontality and parallel wayes in</i>	84
<i>See</i> <i>her Body.</i>	84
<i>See</i> <i>Chap. 27. To adjoyne a Piece whole Sank</i>	84
<i>See</i> <i>by the Curved way and parallel way in her</i>	84
<i>See</i> <i>Body.</i>	84
<i>See</i> <i>Chap. 28. To adjoyne a Piece whole Sank</i>	84
<i>See</i> <i>by the way Traversy and the parallel</i>	84
<i>See</i> <i>way.</i>	84
<i>See</i> <i>Chap. 29. Of the Laine and Large Lige</i>	84
<i>See</i> <i>Chap. 30. To finde the weight of any Shot</i>	84
<i>See</i> <i>by the Dials Instrumentality.</i>	87
<i>See</i> <i>of Tullie of the Weyghes and Measures of</i>	90
<i>See</i> <i>all Materials and shotis used.</i>	90
<i>See</i> <i>Chap. 31. To expone the force Generetivly</i>	91
<i>See</i> <i>and Inventiones.</i>	91
<i>See</i> <i>A Table to knowe any Piece by the fash</i>	93
<i>See</i> <i>of the kind, and the Quodality, to any</i>	93
<i>See</i> <i>A Table of the weight of an Inch being,</i>	93
<i>See</i> <i>for weight of Iron, Lead, and Stone</i>	94
<i>See</i> <i>Shotis.</i>	94
<i>See</i> <i>The Description and use of my Gunnes</i>	94
<i>See</i> <i>Scales.</i>	94
<i>See</i> <i>Chap. 32. Of the Rule of Calibres, or the</i>	95
<i>See</i> <i>quant for each Shotis.</i>	95
<i>See</i> <i>Chap. 33. Of the Gunnes Quantities.</i>	95
<i>See</i> <i>Chap. 34. A new Device of the Calibres,</i>	96
<i>See</i> <i>to Lead, Alloys, or Inventiones, of a Piece of</i>	96
<i>See</i> <i>Ordnance, by a Scale, or Table.</i>	96
<i>See</i> <i>Chap. 35. To finde the right Range of a</i>	97
<i>See</i> <i>Piece for every Measure.</i>	97
<i>See</i> <i>Chap. 36. To finde the Levell under the</i>	98
<i>See</i> <i>right Range.</i>	98
<i>See</i> <i>Chap. 37. To finde the Levell under the</i>	99
<i>See</i> <i>Crooked Range.</i>	99
<i>See</i> <i>Chap. 38. Of the veynen Crooked and Na-</i>	99
<i>See</i> <i>tural Confe of a Shotis.</i>	99

No. 12756 (page 636).

An early English work on gunnery.



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The author was the discoverer of *Nobili's Rings*, the coloured transparent films of metal deposited by electro-chemical action. He also invented the thermo-multiplier, discovered the present form of the galvanometer by combining Schweigger's multiplier with Ampère's astatic needle, and was the first to prove that fluids in contact show an electro-motive action.

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- 'Sir John Cope Bart.' is not identical with Lt.-Gen. Sir John Cope ('Johnnie Cope'), who was defeated by Prince Charles Edward at Prestonpans.
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- This work is numbered from page 71 to 92, with a title and dedication to the Duke of Buckingham. It was published with W. Bourne's 'Art of Shooting', 1643, but appears to have also been issued separately.
- In the dedication to the second Duke of Buckingham ('Zimri') the author complains of the 'penury of expert gunners and understanding men, and the weakness of the present meanes to breed more hereafter'.
- Neither of the above important works was known to Lowndes, who only mentions the author's 'Mathematical Appendix' (1604).
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Between 1683 and 1685 the author measured a degree of the meridian between London and York, and in it first employed the compass to avoid deviations from the route measured—a fact unnoticed in *D. N. B.*

He was sent out by the Bermuda Company to survey the islands in 1616 (when he was accused of dishonest collusion with the Governor), and is of interest to Americans as having in 1623 patented lands in VIRGINIA, though it is doubtful whether he ever went there.

'He personally measured, partly by chain and partly by pacing, the distance between London and York, making corrections for all the windings of the way, as well as for the ascents and descents. He also, from computations of the sun's altitude, computed the difference of latitude of the two places, and so calculated the length of a degree of the meridian. Considering the roughness of his methods and the imperfection of his instruments it is not surprising that his result was some 600 yards too great; but even so it was the nearest approximation which had then been made in England.'—*D. N. B.*

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Unknown to Poggenдорff and Houzeau and Lancaster, and to the author's biographer in *Allgemeine Deutsche Biographie*. The author occupied with success high judicial positions in Prussia, without however receiving the smallest payment for his services from his niggardly King.

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Verona, Sebastian dalle Donne e Giovanni Fratelli [col.] 1576  
Published six years before Pope Gregory XIII. published the Reform of the Kalender. The work was unknown to Poggendorf, Brunet, or Graesse.
- 12881 **PADULLI (Girolamo)** Le PRINCIPALI PROPRIETÀ delle TRE CURVE CONICHE esposte e dimostrate; with 2 plates, 4to. (pp. 48), sewn, 4s  
Unknown to Riccardi and Poggendorf.  
Roma, 1777
- 12882 **PAGE (Thomas, C.E., M.I.C.E.)** REPORT on the SYSTEM of WEAVING by COMPRESSED AIR in the PATENT PNEUMATIC LOOM, 4to. (pp. 19), sewn (title slightly defective), 3s 6d Cambridge, 1864  
The pneumatic loom was invented by Charles Weightman Harrison, and favourably reported on by the author, the assistant of Sir I. K. Brunel, and himself builder of Westminster new bridge, and the designer of the Albert Embankment.
- 12883 **PALACHE (Charles), and H. O. WOOD**: CRYSTALLOGRAPHIC NOTES on MINERALS from CHESTER, MASS., with plate, roy. 8vo. (pp. 12), sewn, 1s 6d  
[Boston, Mass.], 1909

- 12885 **OZANAM (Jacques; de l'Académie des Sciences)** CURSUS MATHEMATICUS: or a Compleat Course of the Mathematics, VOLS. I-IV, containing I. Algebra, and the Elements of Euclid. II. Arithmetic and Trigonometry. III. Geometry and Fortification. IV. Mechanics, and Perspective, now done in English, with Additions and Corrections by Several Hands, *with numerous copperplates*, 4 vols. 8vo. *contemporary calf*, 4s 6d 1712
- 12886 [—] MÉTHODE de LEVER les PLANS et les CARTES de TERRE et de MER, avec toutes Sortes d'Instrumens et sans Instrumens; nouvelle Édition; *with 16 folding copperplates of Surveying Instruments, etc.*, 16mo. *fine copy in old calf gilt*, 5s 1750
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- <sup>1</sup>Leibnitz parle avantageusement de cet ouvrage dans son *Commercium Epistolicum* avec Bernoulli, à cause de quelques méthodes algébriques utiles dans la réduction des quantités irrationnelles. Il y résoud d'ailleurs un grand nombre de questions de l'analyse indéterminée, et sur les triangles rectangles en nombres.—*Montucla*.
- 12888 — RECREATIONS MATHÉMATIQUES et PHYSIQUES, qui contiennent plusieurs Problèmes d'Arithmétique, de Géométrie, de Musique, d'Optique, de Gnomonique, de Cosmographie, de Mécanique, de Pyrotechnie, et de Physique, avec un TRAITÉ des HORLOGES ÉLÉMENTAIRES; nouvelle Édition, augmentée [par M. GRANDIN]; *with over 100 copperplates*, 4 vols. 8vo. *contemporary calf*, 12s 6d 1725, or '50
- <sup>1</sup>Cet ouvrage curieux contient la solution d'une foule de problèmes. On y trouve encore un traité de *horloges élémentaires*, une dissertation sur les *lampes perpétuelles*, enfin un ample recueil de tours de gobelets et d'escamotage'.—*Quéraud*.
- <sup>2</sup>Best edition of an interesting work. Half the first volume is devoted to the theory of numbers, of which Ozanam was a perfect master'.—*Libri Catalogue*.
- It is the final edition in the original form of this well-known work, which was afterwards almost entirely rewritten by Montucla.
- 12889 — RECREATIONS MATHEMATICAL and PHYSICAL; laying down and solving many Profitable and Delightful Problems, of Arithmetick, Geometry, Opticks, Gnomonicks, Cosmography, Mechanicks, Physics, and Pyrotechny, done into English. *with 28 copperplates, and numerous woodcuts*, 8vo. *old calf gilt (one joint cracked, but a sound copy)*; *rare*, 10s 6d 1708
- 12890 — NEW EDITION, styled: RECREATIONS in MATHEMATICS and NATURAL PHILOSOPHY, lately recomposed, and greatly enlarged by J. E. MONTUCLA; and now translated, with many Additions and Observations, by CHARLES HUTTON, F.R.S., *with 98 folding plates*, 4 thick vols. Svo. *contemporary hf. morocco* (SCARCE), £1. 1s 1803
- BEST ENGLISH EDITION of this popular work. Ozanam's work itself was based on those of Bachel de Meziriac (v. Nos. 204 and 500), Jean Leurechon ('H-nri van Etten'; v. Nos. 7604-8 and 10770-4), and Mydorgue (v. No. 3170).
- <sup>1</sup>I believe that it would be difficult to find in any of the books current in England on mathematical amusements as many as a dozen puzzles which are not contained in one of these four volumes'.—*W. W. R. Ball*. The above edition has also been used, and is frequently referred to, in Mr. Ball's *Mathematical Recreations and Problems*.
- 12891 — TABULÆ SINUUM, TANGENTIUM et SECANTIUM ad 10000000 Partium Radium, necnon LOGARITHMORUM, Sinuum ac Tangentium ad 10000000000 Partium Radium, 8vo. *old calf (sound copy)*, 5s Amsterdam, 1697
- 12892 — TRAITÉ des LIGNES du PREMIER GENRE, expliquées par une Méthode nouvelle et facile: TRAITÉ de la CONSTRUCTION des ÉQUATIONS, pour la Solution des PROBLÈMES INDETERMINÉZ: TRAITÉ des LIEUX GEOMETRIQUES, expliqués par une Méthode courte et facile; *with 34 plates*, 3 vols. 4to. in 1, *old calf gilt (back slightly rubbed)*, *with armorial bookplate of 'Lady Dowager Arundell'* (RARE), 15s 1687
- The author solves equations of a higher degree than the second by means of conic sections. The third work is a treatise on analytical geometry, while the first contains the solution of 4 'curious' problems, 'qui est de notre invention, et que je n'ay communiquée qu'à peu de personnes.'
- 12893 — TREATISE of FORTIFICATION, containing the Ancient and Modern Method of the Construction and Defence of Places, and the Manner of Carrying on Sieges, done into English, and amended by J. T. DESAGULIERS, of Hart-Hall, Oxon. [F.R.S.], with Appendix, concerning the Manner of Fortifying, which is truly MR. VAUBAN'S: never before in English, *with 46 plates (many fold. ng)*, 8vo. *old calf (back damaged)*, 5s Oxford, 1711
- 12894 — SECOND EDITION, with PLAN of GIBRALTAR, with its Fortifications, shewing the great Strength and Use of it, *with 46 plates, and 2 folding maps*, 8vo. *old calf, neatly rebacked, with the fine gilt morocco armorial booklabel of Edward Haïlstone*, 8s 6d 1727
- Gibraltar in English hands had already withstood one stiff siege in 1704-5.
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- The first edition containing a description of both instruments. It was unknown to Quéraud.
- 12896 — USAGE de l'INSTRUMENT UNIVERSEL, pour résoudre promptement et très-exactement tous les Problèmes de la Géométrie pratique sans aucun Calcul, première édition; *with 2 folding plates (one illustrating the instrument)*, 12mo. *old calf gilt (rare)*, 8s 6d 1688
- The author claims to have been the first to use the instrument in all surveying operations.
- It would be interesting to know for certain whether Ozanam the mathematician was an ancestor of the pious and gifted littérateur ANTOINE FRÉDÉRIC OZANAM, friend of Lacordaire and co-founder of the Society of St. Vincent de Paul, the centenary of whose birth was kept in Paris in April, 1913.
- 12897 **PAGNINI (Giovanni)** COSTRUZIONE ed USO del COMPASSO di PROPORZIONE; *with 15 plates, 4to. hf. cl.*, 7s 6d Napoli, 1753
- <sup>1</sup>Si estende particolarmente nella risoluzione di molti problemi relativi all' uso di questo strumento'.—*Riccardi*.
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for private circulation [1863]

This work, which was unknown to the author's biographer in *D. N. B.*, describes his invention of converting old smooth-bore ordnance into rifled guns by inserting tubes of coiled wrought iron—an inner tube of more ductile and an outer of less ductile metal—in cast-iron guns suitably bored out. 'Guns so treated were found on trial to give excellent results, and the method afforded means of utilizing the large stock of cast-iron smooth-bore ordnance . . . at one-third of the cost of new guns. Some thousands of these 'converted guns' have taken their place in the armament of our fortresses and coast batteries' (*D. N. B.*)—as built during the invasion-scare in the early 'Sixties.

Only a few copies of this work were privately printed, and it is now very scarce.

12905 **PALMER (Chase; Chemist to U.S. Geol. Survey) The GEOCHEMICAL INTERPRETATION of WATER ANALYSES**, with map and 4 folding tables, 8vo. (pp. 31), *sewn*, 1s 6d Washington, 1911

12906 **PALMER (Major-Gen. Henry Spencer, R.E.) The ORDNANCE SURVEY of the KINGDOM: its Objects, Mode of Execution, History, and present Condition**, 8vo. cl., 2s 1873

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Important for the editor's preface (pp. 78), in which he lays the foundation of his theory of the fracturing and folding origin of the earth's crust. The work also describes the author's seismographic apparatus and his electrometer for atmospheric electricity.

12908 — Der AUSBRUCH des VESUVI' vom 26. APRIL 1872, autorisirte deutsche Ausgabe, besorgt von C. RAMMELSBURG; with 7 plates, 8vo. *sewn*, 1s 6d Berlin, 1872

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This supplementary volume (forming vol. III) is rare, and was unknown to Quéfard and the *Biographie Générale*.

'Ce livre contient beaucoup de renseignements précieux'.—*Bagn. Gén.*

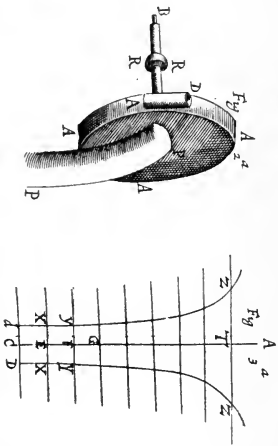
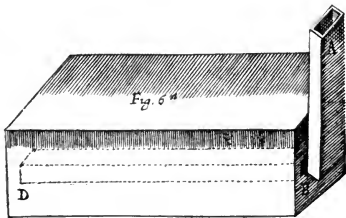
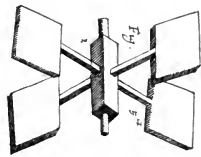
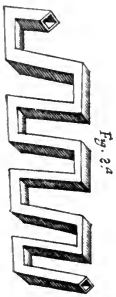
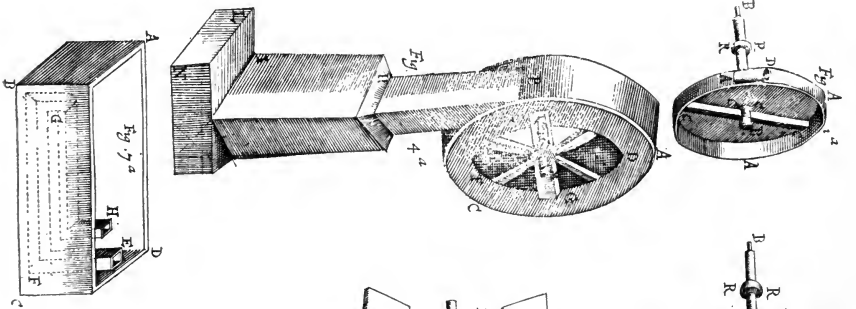
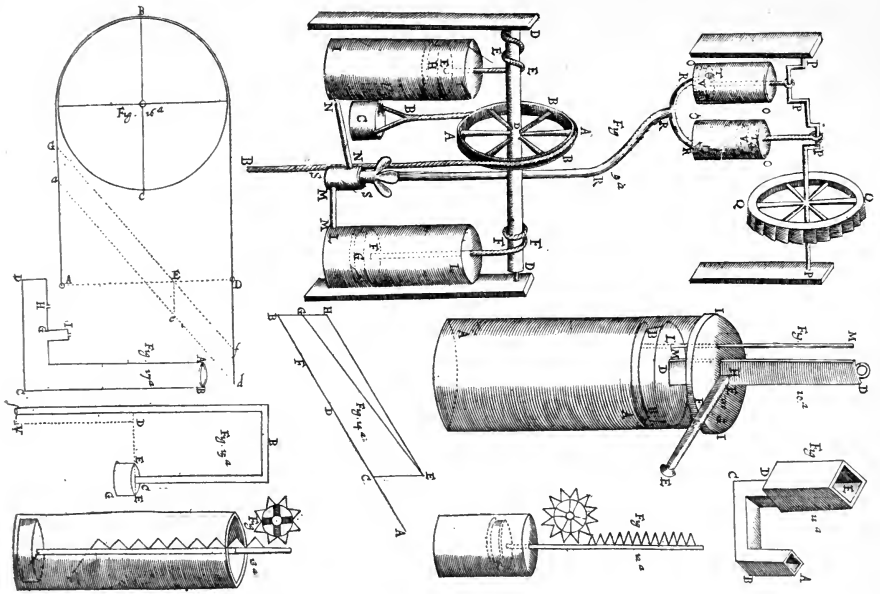
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This work contains the invention of the steam digester, and, forming part of it, that of the SAFETY VALVE. The latter exerted a great influence on the progress of the steam engine, as it did not form part of the engines constructed before this (*e. g.* Savery's and the Marquess of Worcester's).

The work was originally published in English, in 1681, as 'The New Digester'. This French edition contains an 'Advis' by CLAUDE COMIERS, in which he describes an improved form of the digester.





No. 12932 (page 646).

An important work for the history of the steam engine.

- 12912 [**PACIOLI** (Luca, *hic* Lucas de Burgo Sancti Sepulcri, *Ord. Min.*) *SUMA* de ARITHMETICA GEOMETRIA PROPORTIONI & PROPORTIONALITA, prima edizione; sig. a<sub>1</sub> surrounded by fine woodcut border, also numerous woodcuts and geometrical figures on margin after LEONARDO DA VINCI, besides large woodcut initials (the first containing the AUTHOR'S PORTRAIT), 2 vols. folio in 1, gothic letter; newly and finely bound in hf. brown polished Levant morocco gilt, rough g. c. (29 ll. margined or very neatly mended on margin, and a few ll. slightly soiled; otherwise a very fine and exceptionally tall copy, measuring 12½ × 8½ inches); very rare, £11. 11s  
[col.] Vinegia . . . Paganino de Paganini da Brescia.  
M.CCCC.LXLIIIJ [1494]. adi. 10. de novèbre.
- 12913 ——— ANOTHER COPY, unbound (wanting the first 9 and last 20 ll., partly water-stained, and a few ll. wormed), cheap, £2. 2s  
\*Certainly the FIRST PRINTED WORK ON ALGEBRA and PROBABLY THE FIRST ON BOOK-KEEPING.—Prof. de Morgan, Hain-Copinger, 4105. Proctor 5168.  
There is another issue of this edition (a fact not noticed by bibliographers, e.g., Brunet or Graesse), in which the woodcut border is absent, and the fine woodcut initials are replaced by smaller ones.
- 12914 ——— [SECONDA EDIZIONE:] SUMMA de ARITHMETICA, GEOMETRIA, PROPORTIONI, et PROPORTIONALITA, nouamente impressa; with fine woodcut border on title and first leaf of text, and numerous fine woodcut initials (one giving the author's portrait), besides numerous diagrams on margin, folio, gothic letter; boards (last 25 ll. holed, rendering text of last 10 ll. defective; also title margined and guarded); VERY RARE, cheap, £3. 3s  
[col.] per Paganino, in Tusculano sulla riva dil lago Benacense, 1523  
The above second edition is as rare as the first, and perhaps preferable to it on account of its typographical execution. The author, perhaps better known as LUCA DI BORGO [or BURGO], the name he took on entering religion, was the first to introduce symbols in algebra.  
\* In the arithmetical Pacioli gives rules for the four simple processes, and a method for extracting square roots. He deals pretty fully with all questions connected with mercantile arithmetic, in which he works out numerous examples, and in particular discusses at great length bills of exchange and the theory of book-keeping by double entry. This part was then the first systematic exposition of algebraic arithmetic. . . . In the algebra he discusses in some detail simple and quadratic equations, and problems on numbers which lead to such equations. He mentions the Arabic classification of cubic equations, but adds that their solution appears to be as impossible as the quadrature of the circle. . . . Though much of the matter described is taken from Leonardo's *Liber Abaci*, yet the notation in which it is expressed is superior to that of Leonardo,\* etc. etc. etc.—*J. W. R. Ball*.  
\* In the mathematical writings of the monk Luca Pacioli symbols began to appear. They consisted merely in abbreviations of Italian words, such as *p* for *plus*, *m* for *meno*, *co* for *costa*. . . .—Prof. Ujvari.  
\* Il y a dans ce grand recueil une méthode fort ingénieuse pour la résolution de plusieurs équations indéterminées du second ou du quatrième degré. . . . On y voit la résolution des équations dérivées du second degré, et celle de certaines équations exponentielles. Dans quelques problèmes relatifs à la règle de parties, le calcul des probabilités se montre pour la première fois. . . . Enfin on y trouve l'application de l'algèbre à la géométrie et une multitude de faits, relatifs à diverses branches des connaissances humaines et fort utiles aux personnes qui veulent étudier l'histoire des sciences. C'est, par exemple, dans un traité de commerce inséré dans cette *Somme*, que l'on trouve pour la première fois la tenue des livres en partie double, etc. etc. etc.—*G. Libri*.
- 12915 **PAGE** (David, F.G.S., *Prof. Geol.*, Durham Coll. of Science) ADVANCED TEXT-BOOK of GEOLOGY [with GLOSSARY (pp. 35)], 4th Edition, enlarged, with numerous woodcuts, cr. 8vo. cl., 3s (p. 7s 6d) 1867
- 12916 ——— FIFTH EDITION, enlarged, with numerous woodcuts, cr. 8vo. (pp. 488), cl., 3s 6d (p. 7s 6d) Edin., 1872
- 12917 **PAGE** (James Morris, *Univ. Va.*) ON THE PRIMITIVE GROUPS OF TRANSFORMATIONS IN SPACE of FOUR DIMENSIONS: Inaugural Dissertation at Leipzig, roy. 4to. (pp. 54), sewn, 3s Baltimore, 1888
- 12918 **PAGE** (Thomas, M.I.C.E.) REPORT on the SYSTEM of WEAVING by COMPRESSED AIR in the PATENT PNEUMATIC LOOM [of CHARLES WEIGHTMAN HARRISON], 4to. (pp. 19), sewn, with author's inscr., 4s 6d Cambridge, 1864
- 12919 **PAGE** (Sir Thomas Hyde, R.E.; F.R.S.) ESTIMATE of the EXPENSE for carrying into Execution the PLAN of EMBANKMENT for the IMPROVEMENT of the DRAINAGE of the SOUTH and MIDDLE LEVELS, and other Lands having their Drainage through the RIVER OUSE, and for the Improvement of its Navigation, etc. etc., with folding map, 8vo. (pp. 29), sewn, with marginal MS. notes (? by JOHN RENNIE, F.R.S.), 7s 6d 1794  
\* He was chief engineer for forming the New Cut from Eau Brink to King's Lynn, a problem of navigation and drainage that has puzzled engineers since the time of Charles I.—*D. N. B.*
- 12920 **PAJOT des CHARMES** (C., *Inspecteur des Manufactures*) L'ART du BLANCHIMENT des TOILES, FILS et COTONS de tout Genre, rendu plus facile et plus général, au Moyen des NOUVELLES DÉCOUVERTES, avec la Méthode de DÉCOLORER et de ramener à un État de Blancher parfait toutes les TOILES PEINTES ou IMPRIMÉES; suivi des Procédés les plus sûrs pour blanchir les Soies et les Laines, et des Découvertes faites par l'Auteur dans l'ART de BLANCHIR les PAPIERS, première édition; with 9 folding copperplates, 8vo. hf. red morocco, by BELZ-NIEDRÉE (rare), 15s 1798
- 12921 ——— [NOUVELLE ÉDITION, corrigée]; with 9 folding copperplates, 8vo. sewn, 10s An VIII [1800]  
Interesting as an early work describing the chlorine bleaching process, discovered by Berthollet in 1785.
- 12922 **PALMER** (Henry R., M.I.C.E.) DESCRIPTION of a RAILWAY on a NEW PRINCIPLE; with Observations on those hitherto constructed, and TABLE shewing the comparative Amount of RESISTANCE on several now in Use, also an Illustration of a newly observed Fact relating to the Friction of Axles, and Description of an IMPROVED DYNAMOMETER, for ascertaining the Resistance of Floating Vessels and Carriages moving on Roads and Railways; 2nd Edition, revised, with 2 folding plates, 8vo. (pp. 68), sewn (SCARCE), 15s 1824  
This was perhaps the first suggestion for a monorail line, as afterwards reduced to practice on the Lartigue system, as on the Listowel and Ballyhunion Railway. It was to follow the contour of the country, slightly raised on posts or trestles, the trucks being drawn by a horse walking beside it. One plate gives a general view of the line, and the other constructional details. The resistance tables are compiled from the Cheltenham, Llanelly, and other tramroads of the time.  
The work is not mentioned by Allibone, nor can anything be traced concerning its author.



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Venetis, B. Zalterius, 1563

'Bella e rara edizione'.—Riccardi. The work is composed of the following chapters: I. De tempore. II. De computo Calendarii. III. De sphaera. IV. De arithmetica. V. De omnifariis sphaere utilitatibus. VI. De astronomicis instrumentis.

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M. de Pambour is unaccountably left out of the *Nouvelle Biographie Générale*, 1862, although, living in the midst of the Romantic Period, he was a pioneer of workaday progress in France.

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The work is also of great importance for containing Papin's INVENTION of the CENTRIFUGAL PUMP. Added is an interesting account thereon by Mr. Hodgkin, as published in *Engineering* for 1890. It was unknown to Quérard, Poggendorff, *Bioar. Gén.*, and other bibliographers, and is of great rarity.

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- 13144 **PERSPECTIVE**, INSTRUCTION sur la; with folding plate; INSTRUCTION sur le DÉFILEMENT des OUVRAGES de CAMPAGNE, 2<sup>e</sup> Edition; with 3 folding plates—in 1 vol. 8vo. (pp. 67), hf. calf, 3s 1828-30
- 13145 **PESENTI (Cesare)** Il CEMENTO ARMATO, e la sua Applicazione Pratica: Formole, Tavole Grafiche, Tabelle Numeriche ed Esempi Pratici pel Calcolo di Costruzioni in Cemento Armato; with plates and other illustrations, roy. 8vo. *sewn*, 3s (p. L. 5.50 nett) Milano, 1910  
The failures of reinforced concrete have yet to be chronicled.
- 13146 **PESSUTI (Abate Gioacchino)** DESCRIZIONE, MANEGGIO ed USI del TEODOLITO, Istrumento più di qualunque altro Sicuro Spedito ed Universale, with large folding copperplate, 8vo. boards (plate water-stained), 5s Roma, 1794
- 13147 ——— ANOTHER COPY, contemporary hf. calf (sound copy), 6s
- 13148 ——— OPUSCOLI due all' IDRODINAMICA appartenenti il primo sulla TEORIA delle TROMBE IDRAULICHE, il secondo sulla LEGGE delle VELOCITÀ dell' ACQUA prorompente da' PICCOLI FORI de' Vasi; with copperplate, 4to. contemporary hf. roan gilt (fine copy), 10s 6d *ibidem*, 1789  
'Sur l'hydraulique il a laissé des travaux remarquables.'—*Biogr. Gén.*, where the first treatise only is mentioned. Neither was known to Riccardi.
- 13149 ——— RIFLESSIONI ANALITICHE sopra una Lettera dal ABATE CONTE VINCENZO RICCATI; with plate, 8vo. *sewn*, 4s 6d Livorno, 1777  
The work deals with imaginary numbers. Riccati's letter is included in it.



- 13151 **PERRY** (Jevon James Muschamp, *pr.*; F.R.A.S.) OBSERVATIONS and MEASUREMENTS on DOUBLE STARS, made at St. Paul's Vicarage, Alnwick, with 18" Silvered Glass Reflector, between 1880 and 1884, a Manuscript on 43 ll., with 4 original sketches of comets, 4to. *hf. bound*, 5s [1880-4]
- 13152 ——— ORIGINAL WATER-COLOUR DRAWINGS of JUPITER, 19 well-executed drawings, sketched between 1880 and 1884, with explanatory MS. Notes, in 4to. Album, *cl.*, 8s 6d [1880-4]  
 These drawings are interesting in connexion with the 'Great Red Spot' of Jupiter, which originally suggested them. As in the foregoing work, the author used an 18" silvered reflector, made by With of Hereford for Henry Cooper Key, *pr.*, F.R.A.S., in 1878, which he describes as 'one of the finest 18" mirrors in existence'.
- 13153 **PERRY** (Capt. John) ACCOUNT of the STOPPING of DAGGENHAM BREACH, with the Accidents that have attended the same from the first Undertaking, with proper RULES for PERFORMING any the like WORK, and Proposals for rendering the PORTS of DOVER and DUBLIN (which the Author has been employ'd to Survey) commodious for entertaining LARGE SHIPS, with large coloured MS. plan of levels overflowed by the breach, 8vo. *old calf (back slightly damaged, and 2 ll. in a neat contemporary MS.)*; RARE, £1. 1s 721  
 'This book was bought by Mr. [ROBERT] MYLNE [F.R.S. (1734-1801)], Surveyor to Blackfriars Bridge, at the sale of Admiral Henry Norris's effects & presented by him to L. Henderson who transfers his title to Mr. [WILLIAM] CHAPMAN [C. E. (1749-1832)]. Dublin, 1792. W. C. to E. W. C.—*Inscr. on flyleaf.*  
 'In 1714, tenders being invited to stop the breach in the Thames embankment at Dagenham in Essex, Perry offered to do the work for £25,000. The contract was, however, given to William Boswell, who asked only £10,300. Boswell having found his task impossible, the work was entrusted to Perry in 1715. He completed it successfully in five years' time; but the expenses so far exceeded anticipation that, though an extra sum of £15,000. was granted to him by parliament, and a sum of £1,000. presented to him by the local gentry, Perry gained no profit by the transaction. He published an account thereof in 'An Account' etc. (*supra*).—D. N. B.  
 He had a singularly chequered career. As a commander of the fireship Cygnet he surrendered after a very slight resistance to a French privateer. He was court-martialled for dereliction of duty in not setting fire to his ship before the Frenchmen boarded her, found guilty, and sentenced to a fine of £1,000, and ten years' imprisonment in the Marshalsea. In 1698 he proceeded to Russia, engaged by the TSAR PETER, to superintend the naval and engineering works in that country, to leave fourteen years later afraid for his life after humbly reminding the Great Tsar that he had only paid him one year's salary. Subsequently he embarked upon the above unlucky venture (D. N. B.).
- 13154 **PERRY** (John, F.R.S.; *Roy. College of Science*) APPLIED MECHANICS: a Treatise for Students who have Time to work Experimental, Numerical, and Graphical Exercises, with 371 illustrations, *cr. 8vo. cl.*, with booklabel of, and a few MS. notes by, F. J. Jervis-Smith, *pr.*, F.R.S., and author's auto., 3s 6d 1897
- 13155 ——— NEW [LATEST] Edition, enlarged, with 372 illustrations, *cr. 8vo. cl.*, 4s 6d 1909
- 13156 ——— The CALCULUS for ENGINEERS, with 106 diagrams, *cr. 8vo. cl.*, 3s 6d (p. 7s 6d) 1897
- 13157 ——— TENTH IMPRESSION [revised, with Appendix], with 106 diagrams, *cr. 8vo. cl.*, 4s 6d [1910]  
 An excellent manual for those who have only an elementary knowledge of algebra and trigonometry.
- 13158 ——— ENGLAND'S NEGLECT OF SCIENCE, 8vo. *cl.*, 1s 6d 1900
- 13159 ——— LONG-DISTANCE TELEPHONY, 8vo. (pp. 8), *sewn*, 1s 6d 1893
- 13160 ——— SPINNING TOPS, with 59 illustrations, *cr. 8vo. cl.*, 1s 6d S.P.C.K., 1890
- 13161 ——— The STEAM ENGINE and GAS and OIL ENGINES: a Book for Students who have Time to make Experiments and Calculations [new Edition, corrected], with 325 illustrations, 8vo. *cl.*, 4s 6d (7s 6d nett) 1904
- 13162 ——— The TEACHING of MATHEMATICS, with Discussion, before the British Association, Glasgow, 1901, post 8vo. *cl. boards*, with author's *inscr.*, 2s 6d 1901  
 Added are: Remarks, by G. B. MATTHEWS, F.R.S. (pp. 6), and 'The Cultivation of the Mathematical Imagination', by MARY EVEREST BOOLE, *Colchester, n. d.*
- 13163 ———, J. GRAHAM, and C. W. HEATH: LIQUID FRICTION, with folding plate, 8vo. (pp. 18), *sewn*, with Prof. Perry's *inscr.*, 1s 6d [1893]
- 13164 **PERRY** (Stephen Joseph, S.J., F.R.S.) REPORT of the OBSERVATIONS of the TOTAL SOLAR ECLIPSE of August 29, 1886, made at the Island of CARRIACOU, with plate and diagram, *roy. 4to.* (pp. 12), *sewn*, with author's *inscr.*, 1s 6d 1889
- 13165 **PETAU** (Denis, *Latinè Dionysius Petavius*, S.J.) URANOLOGION, sive SYSTEMA variorum AUTHORUM, qui de SPHERA, ac SIDERIBUS, eorumque MOTIBUS Græcè commentati sunt: GEMINUS et ACHILLES TATIUS, HIPPARCHUS, PTOLEMÆUS, THEODORUSGAZA, MAXIMUS, ISAACUS ARGYRUS, S. ANDREAS CRETENSIS. Omnia vel GRÆCÈ ac LATINÈ nunc primum edita, vel antè non edita; accesserunt variarum Dissertationum Libri VIII; with vignette on title and diagrams, thick *roy. folio, old vellum (fine copy)*; RARE, £1. 10s Lutetie Paris., S. Cramoisy, 1630  
 Dedicated to Cardinal Richelieu, and valuable for the first containing some of the authors mentioned in the title. The work was reprinted in Amsterdam, 1703.  
 'Il fut admiré de son temps, au point qu'on frappa en son honneur une médaille avec ses mots: Au prince des chronologistes.'—*Bioar. Gén.*
- 13166 **PETERMANN** (Andreas, *Univ. Leipzig*) OPUSCULA MEDICA atque CHIMICA, olim separatim, nunc vero conjunctim edita, eorum Usui apprime inserventia qui Arti huic salubriori noviter se manciparunt; with portrait, large 12mo. *old calf gilt*, 4s Lipsie, 1750  
 Nothing appears to be known of the author, who is not mentioned by Poggendorf, Kopp, and others.
- 13167 **PETERS** (Christian August Friedrich; *Sternwarte Altona*) NUMERUS CONSTANS NUTATIONIS, ex ASCENSIONIBUS RECTIS STELLAE POLARIS, in Specula Dorpatensi Annis 1822 ad 1838 Observatis deductus; adjecta est Disquisitio Theoretica de FORMULA NUTATIONIS, 4to. (pp. 103), *sewn*, 5s St. Pétersbourg [Petrograd], 1843
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z. p. [? Amsterdam], 1591  
Unknown to Poggeadorff, Graesse, Brunet, and others.  
Petri published an excellent treatise, which went through four [recte five] editions. It deals with arithmetic and geometry, as well as with book-keeping, and treats the subject succinctly and well. The improvements in the matter of stock-taking and of making a periodical trial-balance are incorporated. . . . Petri introduces for the first time two important departures from the older methods. . . . He no longer journalises all transactions *seriatim*, but occasionally groups the kindred items . . . and takes a step towards the separation of the books of primary entry. He introduces an 'Expenses-Book', and at the end of every month transfers the total to cash account by means of the journal. . . . Petri's book is truly one of *primæ* entry.—Richard Brown.  
The above edition was unknown to Mr. Brown, who only quotes those of 1588, 1595, 1596, and 1605. Prof. de Morgan only knew that of 1596.
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printed for the author, by Thomas Dawks, 1683  
Copies having the portrait are especially rare. It is different from that in the *Fodiæ* and less comely, as he has developed an aggressive Roman nose. The above copy is unusually tall, and probably on Large Paper, although Lowndes does not mention such.
- 13180 ——— ANOTHER COPY, contemporary calf, rebound (portrait wanting, but a FINE and TALL COPY), £1. 12s 6d
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The first 377 pp. contain the only English translation ever published of Ercker's classic work. (v. No. 7592, *ante*). The dictionary of mining terms is the first published in the language.
- 13182 ——— REPRINT, with 43 fine engravings on copper, folio, old calf, newly rebound (portrait wanting and title mounted, but a large copy), £1. 5s  
Stephen Bateman, 1865
- 13183 ——— FODINÆ REGALES: or the HISTORY, LAWS, and PLACES of the CHIEF MINES and MINERAL WORKS in ENGLAND, WALES, and the ENGLISH PALE in IRELAND; as also of the MINT and MONY; with a Clavis explaining some difficult Words relating to Mines, etc., with beautiful PORTRAIT by W. SHERWIN (splendid impression), and 4 fine engravings on copper (2 full-page of Mines), folio, old calf (small part of blank margin torn out of portrait, but a LARGE AND SOUND COPY); VERY RARE, £2. 12s 6d  
T. Basset, 1670  
This rare work is very valuable for giving an account of the state of mining in England during the XVIIth. Century. It was undertaken at the request of Prince Rupert and Lord Shaftesbury. Large extracts from it are given in Hunt's 'British Mining'.  
The fine portrait is to be found only in a few copies of the work, it having evidently been subject to the ravages of the grangerizer or print-seller of the past. It is of a much earlier period of his life than that to the 'Fleta Minor' (*supra*), and is not mentioned in *D. N. B.*
- 13184 ——— REPRINT of the FIRST PART, 12mo. sewn (hole through last 6 ll.), 12s 6d F. Collins, 1706  
Added to the above is: 'OBSERVATIONS made by J. H. mostly in the year 1706' (pp. 1-106, without title), which deals chiefly on CORNISH MINING.
- 13185 **PEWTNER** (W.) COMPREHENSIVE SPECIFIER: a Guide to the Practical Specification of every Kind of Building-Artificers' Work, edited by WILLIAM YOUNG, cr. Svo. cl., 2s (p. 6s)  
1870

- 13187 **PETTY** (Sir William, F.R.S.) THE DISCOURSE made before the ROYAL SOCIETY the 26. of November 1674 concerning the USE of DUPLICATE PROPORTION in sundry Important Particulars; with a NEW HYPOTHESIS of SPRINGING or ELASTIQUE MOTIONS, 24mo. *contemporary calf (blank portion of last l. missing, some ll. waterstained, and title soiled)*; RARE, 15s  
*John Martyn, Printer to the Royal Soc., 1674*
- Interesting for containing some extraordinary and interesting speculations in molecular physics. In his dedication to the Duke of Newcastle the author states the work to contain three parts: 'I, an Endeavour to explain the intricate Notions, or *Philosophia Prima* of Place, Time, Motion, and Electricity; II, to excite the World to the study of a little Mathematicks by shewing the use of Duplicate Proportions in some of the most weighty of Humane Affairs; III, Chymical Speculations, to consider such points and proportions, even in *Atoms* (such, whereof perhaps a Million do not make up one visible *Corpusculum*,) as may give an intelligent Account of the Nexures, Mixtures, and Mobilities of all parts of the Universe.'
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*Wien, 1851-5*
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*Parisii, C. Perier, 1557*
- The editor, Erasmus Reinhold, was professor of higher mathematics in the University of Wittenberg, and, according to Poggendorf, one of the first adherents of the Copernican system, and the first to mention, in the above work, the camera obscura, but in an imperfect state (v. PORTA, *Ac.* 13517 *post*). At end is: *Theorica Motus Octavæ Sphæræ*.
- 13192 ——— TRACTATUS super PROPOSITIONES PTOLEMÆI de SINUBUS et CHORDIS; item COMPOSITIO TABULARUM SINUM per JOANNEM de REGIOMONTE, cum TABULIS SINUM DUPLICES per eundem REGIOMONTANUM, editio princeps; *with diagrams, folio, parchment (water-stained, but a sound copy)*; RARE, £1. 1s  
*Norimbergæ, Johan. Petreius, 1541*
- The first satisfactory table of sines ever published, and one of the author's most celebrated works. A full account of it will be found in Prof. Cantor's *Vorlesungen über Geschichte der Mathematik*, Vol. II.
- 'Les deux hommes à qui les mathématiques doivent le plus dans le XV<sup>e</sup> siècle, sont *Purbach* et *Regiomontanus*. Ce ne sera pas concevoir d'eux une idée trop avantageuse, que de les regarder les vrais restaurateurs de ses sciences, et surtout de l'astronomie'.—*Montucla*.
- The author was a native of Peuerbach, a market town of Upper Austria, whence his name; professor of mathematics in the university of Vienna, and the teacher of Regiomontanus.
- 13193 **PFÄFF** (Christian Heinrich, *Univ. Kiel*) REVISION der LEHRE vom GALVANO-VOLTAISMUS, mit besonderer Rücksicht auf Faraday's, de la Rive's, Becquerel's, Karsten's u. a. neueste Arbeiten; *with folding plate*, 8vo. *sewn*, 7s 6d  
*Altona, 1837*
- 13194 ——— ANOTHER COPY, boards (*nice copy*), 8s 6d  
The author was one of the earliest and foremost supporters of the contact theory of voltaic electricity, and much of the work is directed against the chemical theory advanced (by Wollaston, Fabbroui, and Ritter) to account for electric action. He also revised Volta's contact series, and was one of the few who appreciated the importance of Ohm's discovery.
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*München, 1877*
- 13196 **PFÄFF** (Johann Wilhelm Andreas, *Univ. Erlangen*) BETRACHTUNGEN über die SPIRALE; *with plate*, 4to. (pp. 14), *sewn*, 2s  
[? *München, 1832*]
- Not noticed by Poggendorf.
- 13197 **PFAUNDLER** (Leopold v.; *Univ. Graz*) Die ENTWERTHUNG der MATERIE, post 8vo. (pp. 32), *sewn*, 1s 6d  
*Wien, 1888*
- 13198 **PFEFFINGER** (Jean Frédéric) FORTIFICATION NOUVELLE, ou Recueil de différentes Manières de Fortifier en Europe, nouvelle Édition; *with frontispiece, vignette on title, and 46 folding copperplates*, 8vo. boards, uncut, *with auto. of [Gen.] Robert Melville [F.R.S., 1723-1809, inventor of a naval gun]*, 5s 6d  
*La Haye, 1740*
- This work was unknown to Quézard. The *Biographie Générale* only mentions an edition of 1698.
- 13199 **PHELPS** (Robert, *Trinity Coll., Cantab.*) ELEMENTARY TREATISE on OPTICS, intended chiefly to elucidate the PRINCIPLES of the CONSTRUCTION of TELESCOPES, and some other Optical Instruments, *with 69 diagrams*, 8vo. boards, uncut (*scarce*), 5s  
*Cambridge, 1835*
- An early Cambridge text-book of geometrical optics.
- 13200 **PHILLIPPES** (Henry, *Philo-Nauticus*) THE SEA-MAN'S KALENDER: or, an Ephemerides of the Sun, Moon, and certain of the most notable Fixed Stars, also a TABLE of the LONGITUDE and LATITUDE of all the most eminent Places of the World, first calculated by JOHN TAP, corrected, with many Additions, *viz.* New Exact TABLES of the NORTH STAR; New TABLES of 65 of the principal FIXED STARS, etc., with a DISCOVERY of a Way to Find the Long Hidden SECRET of LONGITUDE, by HENRY BOND, all which are now newly calculated and corrected, and many Rules and Tables added, *with woodcuts (with the full-page one on p. 11 intact)*, sm. 4to. *large and sound copy in contemporary sheep (back damaged)*; RARE, *with Tixall Library label*, £1. 15s  
*W. Godbid for E. Hurlock, 1674*
- 'It is a Compendium (if well understood) of the whole Art of Navigation. But its chiefest excellency consists in the Astronomical part thereof; the Tables whereof are so plain and full, and well ordered, that there never were the like in any Book.'—*Address to the Ingenious Sea-man*. At end is a table, giving the latitude and longitude of over 1000 places, by T. STERS, globe-maker.
- The work was unknown to Lowndes, while Watt only quotes an edition of 1696. There was no copy of any edition in the Scott Library, nor is there one in that of the Institution of Naval Architects.

# TRAITÉ

DU TRIANGLE

ARITHMÉTIQUE,

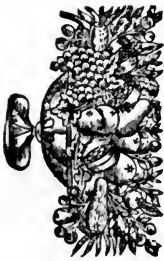
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PETITS TRAITÉS SUR LA

MÊME MATIÈRE.

Par Monsieur PASCAL.

*Notre dévotion*



A PARIS,

Chez GUYLLAUME DESPREZ, rue saint Jacques,  
à Saint Profect.

M. DC. LXV.

	Z	I	2	3	4	5	6	7	L	8	9	10
1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	2	3	4	5	6	7	8	9			
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4	1	4	10	20	35	56	84					
5	1	5	15	35	70	126						
6	1	6	21	56	126							
7	1	7	28	84								
8	1	8	36									
9	1	9										
10	1											

*Rangs paralleles*

*Triangle Arithmetique*

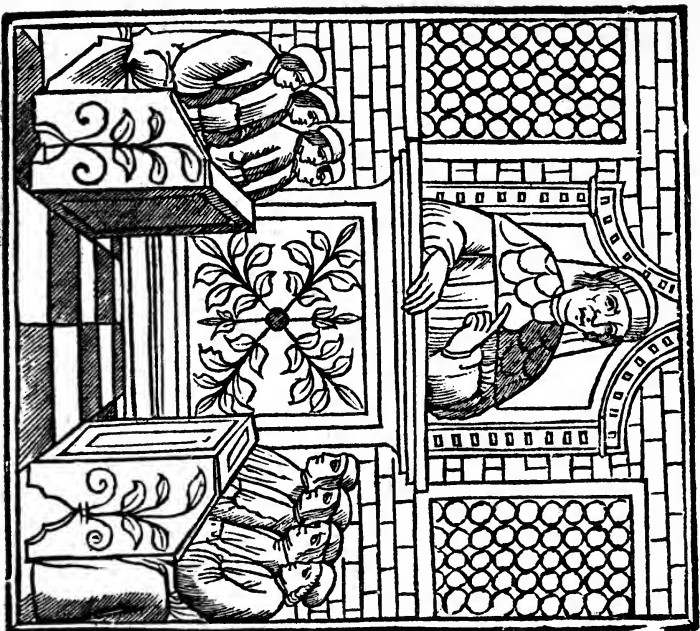
*Rangs perpendiculaires*

No. 12997 (page 650).

Pascal's Arithmetical Triangle.



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QVI COMINCIA LA VTISSIMA OPERA CHIAMATA  
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TE ET EXIMO MESSER BARTHOLMEO DI PAXIDA  
VENETIA.



AVERemo adung prima adchiarare  
nostre eccellente tutte le robe che se ven  
dano in Venetia a peso grosso & quelle che  
se vendano a peso sottile & de l'ordine di  
pesi de li arzaniti & de le conditione di pa  
ni de lane franciche fatte in Venetia: &  
etiam de le conditione di panni de fedas  
panni dorati: & del ordine del vendere de  
le specie: & de le misure: & del ordine  
de le pesi de le farine & bichorti: & del ordine  
de le misure di vini: & del ordine del ven  
der del olio: & in che modo & peso se un  
dano i guadi: & del ordine di frutti che se vendeno a nome di ster: &  
che peso hanno cadaun ster: come responde el peso grosso con tut  
ta la Italia: & tutto el Levante: & etiam come i pessantili  
& pesi grossi respondeno con molterre de Italia: de Dalmatia & de  
Levanet: & come respondeno le misure di panni de lana con tutta la  
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Pp. 270-392 contain an historical account of perpetual lamps. In the last chapter (pp. 372-92) the anonymous author claims that 'depuis l'invention des phosphores, on doit convenir qu'il n'est pas absolument impossible de faire des lampes perpetuelles, surtout par la voye de la chymie.' The work has no title. On p. 1 is printed at bottom 'Tome IV.'

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'Buona edizione'.—*Riccardi*.

The second work 'De le Stelle Fisse', which has a separate title-page and pagination, is of special interest, containing as it does the first published star maps—a fact not generally known. Four different magnitudes are distinguished, and the stars are named with Latin letters. The Greek lettering, still in use at the present time, was first used by Johannes Bayer in 1603 (*q. v. post*).

These star maps in all the above editions are xylographs, and according to M. Libri, 'perhaps the last instance of a xylographic work, or portion of a work of any extent, printed during the XVI. Century.'

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The author gave in the above work an explanation of the formation of dew, by which he was able to explain a dew-maximum on clear nights. His theory was completed in 1814 by Dr. W. C. Wells, F.R.S. (v. Nos. 5322-5 ante).
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This work is not mentioned by Poggenorff and other bibliographers, nor contained in the otherwise complete list of books on electricity in the Catalogue of the Ronalds Library.

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The Libri copy fetched 47 francs in 1847, but the work was unknown to Poggendorf.

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This rare work was unknown to Quézard, Brunet, or Graesse, but is mentioned by Poggendorf, who states that the author made a planetarium, as described above, for Louis XIV., for which he received 'a royal reward', and sold another 'for a high price' to Peter the Great in 1716.

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- 13513 **PORTA** (Giovanni Battista della; *Napoletano*) De AERIS TRANSMUTATIONIBUS Libri IV, in quo Opere diligenter pertractatur de iis, quae, vel ex Aere, vel in Aere oriuntur: Μετεωρολόγιον multiples Opiniones, qua illustrantur, qua refelluntur. Demum variarum Causæ Mutationum aperiantur, editio princeps; with arms on title, woodcuts, diagrams, and folding table, sm. 4to. *contemporary limp vellum, with Cardinal's arms in centre (RARE)*, £1. 5s Rome, B. Zannettus, 1610  
'Une météorologie aussi complète qu'il était possible de la former alors par de simples observations sans aucun instrument de mesure. . . . Il faut mentionner spécialement ce qu'il dit sur les marées, dont il s'était occupé à Venise: ce sont probablement les plus anciennes observations de ce genre qui soient arrivées jusqu'à nous. On doit remarquer une table synoptique des transmigrations de l'air, qui . . . décèle dans l'auteur une faculté éminente de classification.'—*Libri*.

13515 **PORTA (Giovanni Battista della; Napolitano)** Della CELESTE FISONOMIA Libri Sei [tradotta da SALVATORE SCARANO]; with engraved arms on title, portrait *et.* 76, and numerous other woodcuts, sm. 4to. old limp vellum (some ll. browned as usual, otherwise a sound and very large copy), 17s 6d  
Napoli, L. Scorriglio, 1614

13516 ——— **NOVA EDIZIONE** [in fine tituli:] nei quali ributtata la VANITÀ dell' ASTROLOGIA GIUDICIARIA, si dà Maniera di esattamente conoscere per Via delle Cause Naturali tutto quello, che l'Aspetto, la Presenza, e le Fattezze de gl' Huomini possono fisicamente significare, e promettere; with woodcut on title, and the numerous woodcuts re-engraved on an enlarged scale, 4to. sound and clean copy in old hf. calf, 15s  
Padova, P. P. Tozzi, 1616

'Il s'y prononce contre certaines aberrations de l'astrologie judiciaire, mais en accordant aux astres une influence très-active.'—*Biogr. Gén.*

13517 ——— **MAGLE NATURALIS**, sive de MIRACULIS RERUM NATURALIUM Libri IIII, editio princeps; with curious woodcut initials, folio, old Italian vellum (last l. wanting, and some ll. water-stained, otherwise a CLEAN AND SOUND COPY); excessively rare, £3. 10s  
Neapoli, apud Matthiam Cancer, 1558

The first edition of this work in its original and more popular form in four books is of excessive rarity, Riccardi, who apparently could trace no copy of it ('rarissima edizione'), being unable to give a collation, while other bibliographers state that it only contained 3 books.

The *Magia Naturalis* in four books is quite a different work from that in twenty, and contains far more occult and superstitious matter than the latter, which made it however only the more acceptable to the contemporary reader. The author mentions therein the *camera obscura* without the lens, the discovery of which is generally ascribed to Leonardo da Vinci, but was really first mentioned by Levi ben Gerson in a work translated in A.D. 1342 under the title 'De Sinibus et Cordis.' The camera with the lens was first described in the work rewritten in 20 books. Porta also mentions that the declination of the magnetic needle varies with the longitude, which he assumed erroneously could be ascertained by the magnetic variation. The work was written at the age of 15, and is dedicated to Philip II. of Spain. The work as above contains the 'Experimentorum Omnium Magie Naturalis Index' (pp. 10), which is absent in the second edition of Antwerp, 1564, and other reprints.

'De tous les écrits de Porta ce fut celui qui eut le plus de succès; dès sa première apparition, on le traduisit en plusieurs langues, et l'impression du public fut tel, ce livre fut lu avec tant d'avidité, il passa par tant de mains, que cet usage continué a détruit les premières éditions, et que l'en connaît plus que des réimpressions. . . Ces apparitions prodigieuses, ces miracles, étaient le roman de l'époque: et c'est ce vrai que lorsque, après des longs travaux, l'auteur le fit imprimer de nouveau avec de si notables additions, en le purgeant d'un grand nombre de prodiges imaginaires, ce livre perdit considérablement de sa vogue, et fut bientôt relégué parmi d'autres ouvrages du même genre.'—*G. Libri.*

13518 ——— **MAGLE NATURALIS LIBRI XX**, ab ipso Authore expurgati, et superacti, in quibus Scientiarum Naturalium Divitiæ et Delitiæ demonstrantur. I. De mirabilium Rerum Causis. II. De variis Animalibus gignendis. III. De novis Plantis producendis. IIII. De agenda Supellectili. V. De Metallorum Transmutatione. VI. De Gemmarum Adulteriis. VII. De Miraculis Magnetis. VIII. De portentosis Medelis. IX. De Mulierum Cosmetice. X. De extrahendis Rerum Essentiis. XI. De Myropœia. XII. De incendiariis Ignibus. XIII. De raris Ferri Temperaturis. XIII. De miro Conuuiorum Apparatu. XV. De capiendis Manu Feris. XVI. De inuisibilibus Literarum Notis. XVII. De catoptricis Imaginibus. XVIII. De staticis Experimentis. XIX. De Pneumaticis. XX. Chaos; editio princeps, with title within woodcut border, portrait *et.* 50, and numerous other woodcuts and diagrams, folio, old white vellum (some ll. browned as usual, otherwise a sound copy), very rare, £2. 10s

*ibidem*, apud Horatium Salvanum, D.D.LXXXVIII [recte 1589]

13519 ——— **ANOTHER COPY**; old white vellum gilt (some ll. slightly water-stained, and others browned, otherwise a sound and UNUSUALLY TALL COPY), £3. 3s

First edition of the complete work in 20 books, and now of great rarity. Numerous reprints were published, and it was translated into many foreign languages.

13520 ——— **EDITIO NOVA**, nunc vero ab Infinitis, quibus Editio illa [princeps] scatebat Mendis, optime repurgata: in quibus Scientiarum Naturalium Divitiæ et Deliciæ demonstrantur, accessit Index copiosissimus; with woodcuts and diagrams, sm. 8vo. contemporary white vellum (fine copy), 12s 6d  
Rothomagi, Jo. Berthelin, 1650

13521 ——— **EDITIO ALTERA**, cum Indice copiosissimo; with engraved title, and numerous woodcuts and diagrams, 12mo. hf. calf (binding damaged), 10s  
Lugd. Bat., P. Leffen, 1651

13522 ——— **ANOTHER COPY**, white vellum (engraved title wanting, but a very sound copy), 8s 6d

A very neatly printed edition. The engraved title is dated 1650. Porta's *Magia Naturalis* in Twenty Books is quite a different work from that in Four Books, first published in 1558, and is one of the most important works on natural science published during the XVIIth Century. Many of the superstitious and even puerile passages of the latter were left out in this work, and sixteen new books were added. It is a great storehouse of fact and fiction, brought together from every available source and from private conversations, during the author's extensive travels in Italy, France and Spain. Some of the books were afterwards published in an enlarged and separate form.

Of great interest is book VI, which shows that the production of artificial gems must have been far advanced in Porta's time. The seventh contains some important observations on the magnet. The most important however is the seventeenth, which contains Porta's invention of the camera obscura with the lens, and the *laterna magica*, afterwards improved by Father Kircher. A passage of the tenth chapter has also been quoted to ascribe to him (mistakenly) the invention of the telescope.

13523 ——— **NATURAL MAGIC**: in Twenty Books, wherein are set forth all the Riches and Delights of the Natural Sciences, with engraved title (including portrait) by R. Gaywood, and numerous woodcuts and diagrams, folio, old calf (binding rubbed and mended); rare, £4. 4s  
Thomas Young and Samuel Speed, 1658

13524 ——— **ANOTHER COPY**, old hf. calf (wanting printed and engraved titles, Table (3 ll.), 3s 6d and 359-60); a cheap copy, £1. 1s

This English edition, the only one ever published, has now become very rare, presumably from the constant use this favourite book had to undergo.

The *Natural Magic* was the last great storehouse of science with its myriads of 'facts' without any experimental proof or confirmation. It is interesting as having—perhaps the most typical of its kind—been published on the eve of the beginnings of experimental physics, started by William Gilbert and Sir Francis Bacon.

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matters conteyned in the same.

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Printed in London for William Bailey, and  
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end of Grace Church Lane.

MAGIAE NATURALIS,

SIVE

# DE MIRACVLIS REVM NATVRALIVM

LIBRI IIII.



# IO. BAPTISTA PORTA NEAPOLITANO

A V C T O R E.



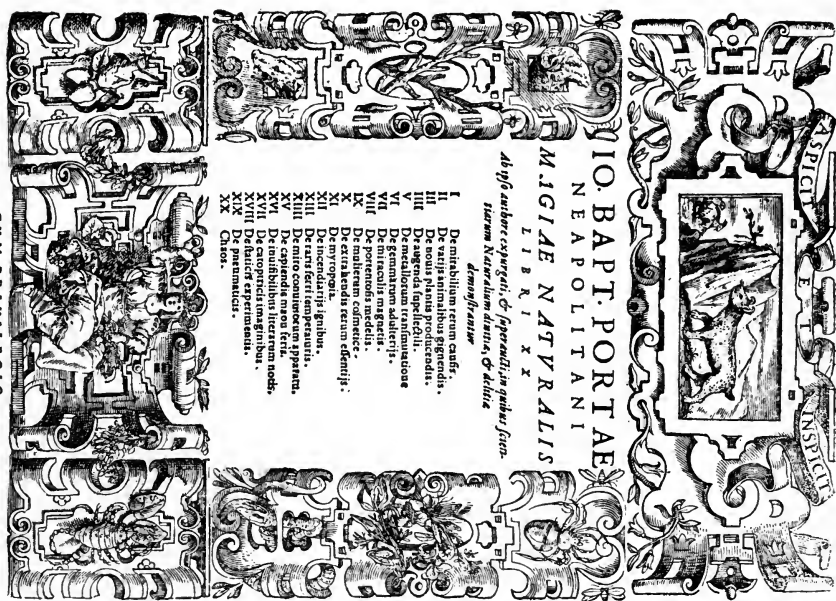
NEAPOLI

APVD MATTHIAM CANCER.

M. D. LVIII.

CVM GRATIA ET PRIVILEGIO

PER DECENNIVM.



ASPECTUS  
SACRIFICII  
SACRIFICII

IO. BAPT. PORTAE  
NEAPOLITANI  
MAGIAE NATVRALIS  
LIBRI IIII

*Ab ipse auctor expurgatis, et figuratis in auctoribus suis  
suisque Neapolitanis dantis, et additis  
demonstratione*

- I De nihilum eorum caufis.
- II De variis animalibus generandis.
- III De motu plantis productis.
- IV De vegetabilibus generandis.
- V De gemmarum adulescentis.
- VI De mineralibus generandis.
- VII De mineralibus medicis.
- VIII De mineralibus medicis.
- IX De extrahendis rebus elementis.
- X De hydropne.
- XI De incendiis gubnatis.
- XII De incendiis gubnatis.
- XIII De igne conuulsum appensum.
- XIV De igne conuulsum appensum.
- XV De igne conuulsum appensum.
- XVI De igne conuulsum appensum.
- XVII De igne conuulsum appensum.
- XVIII De factis experimentis.
- XIX De pneumaticis.
- XX Cibus.

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NEAPOLI, Apud Horatium Schirraum. D. D. LXXXVIII.

Nos. 13517-19 (page 676).

First editions of the two varieties of this celebrated cyclopedia.

- 13527 **PORTA** (Giovanni Battista della; *Napolitano*) De DISTILLATIONE Lib. IX, quibus certa Methodo, multiplici; Artificio, penitioribus Naturæ Arcanis detectis, cuiuslibet mixti in propria Elementa Resolutio, perfectè docetur, editio princeps; with fine engraved portrait *et.* 64 by J. Laurus, and numerous large woodcuts of chemical apparatus, etc., sm. 4to. contemporary white vellum (portrait and some ll. stained and browned), 16s  
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- 13529 — EDITIO NOVA, nunc primum in Germania Typis vulgata ac Indice Capitum et Materiarum exornata; with fine engraved portrait by J. v. Heiden, and the numerous woodcuts re-engraved, sm. 4to. boards, covered with old MS. on vellum (sound and clean copy); RARE, 15s  
*Argentorati, L. Zetzner, 1609*
- The first edition printed in Germany, and unknown to Græsse. It contains an index which is not included in the first edition; the woodcuts are also more neatly executed than in the former edition.
- The above copy belonged to Samuel Eglinger, M.D., professor of mathematics, Basel University (1638-73), and bears the following inscription on its leaf: 'Sam. Eglingeri D. A. MDCLXIII. Felix qui potuit rerit cognoscere causas! Symb.'
- 'Ouvrage curieux en ce qu'il donne un état exact de la chimie au seizième siècle.'—*Biogr. Gén.*
- 13530 — La FISONOMIA dell' HUOMO, et la CELESTE: Libri Sei, tradotti di Latino in Volgare, et hora in questa Settima Impressione ricorretta, con la Fisonomia Naturale di Monsignor Giovanni Ingegneri, di Polemone, di Adamantio, et il Discorso di Livio Agrippa sopra la Natura e Complessione Humana, con il Trattato di Nei di Lodovico Settali, aggiuntovi da nuovo la Metoposcopia di CIRO SPONTONE; with full-page woodcut portrait (different from the foregoing ones), and very numerous large woodcuts, 4to. boards, uncut, 16s  
*Venetia, N. Pezzana, 1668*
- 'Tout en profitant des observations d'Aristote, de Polemon et d'Adamantius, Porta a déployé tant de sagacité dans ses propres recherches qu'il peut passer pour le véritable fondateur de la physiognomie.'—*Biogr. Gén.* To this edition is added the *Celeste Fisonomia* (v. No. 13515 *supra*).
- 13531 — De OCCULTIS LITERARUM NOTIS, seu Artis Animi sensa occultè aliis significandi, aut ab aliis significata expiscandi enodandique Libri III; explicantur autem inter cætera etc. veterum quoque Scriptorum Loca, hac de Arte loquentia; indidemque petita; with woodcuts and figures, 12mo. sound and clean copy in old pressed calf (RARE), £1. 12s 6d Montisbelgardii, J. Foillet, 1593
- 13532 — EDITIO NOVA, priori castigatior, cui [Liber QUINTUS et] AUCTARIUM accesserunt, Additamenta quædam continens, ad præcedentes Libros, tum novis inventis, tum pluribus Exemplis, auctiores et illustriores reddendis; with numerous woodcuts and figures, thick 12mo. fine copy in contemporary white vellum, £1. 10s  
*Argentorati, L. Zetzner, 1606*
- The first edition of this work was published in four books in 1563 as *De Furtivis Literarum Notis*. The fifth book was first published in the edition of Naples, 1592, and the above first contains the 'Auctarium' and is the last mentioned by Riccardi.
- 'Dans ce traité de chiffres on d'écriture secrète, il indique 180 procédés différents et met en outre sur la voie de les multiplier à l'infini.'—*Biogr. Gén.*
- 13533 — PNEUMATICORUM Libri III, quibus accesserunt CURVILINEORUM ELEMENTORUM Libri II, editio princeps; with vignette on title and numerous woodcuts and diagrams, 2 vols. sm. 4to. in 1, old white vellum (a few ll. very slightly wormed, otherwise a large and fine copy); RARE, £1. 5s  
*Neapoli, Jo. Jac. Carlinus, 1601*
- This work is of interest as containing the earliest attempt towards measuring the volume of steam given off by a given quantity of water.
- 'An apparatus similar to that of Hero of Alexandria is described by della Porta in his Pneumatics, published in 1601, with this addition, that the condensation of steam within a close vessel is described as a means of producing a vacuum, and thereby causing water to ascend and fill the vessel.'—*Prof. Rankine, F.R.S.*
- The above volume first contained the author's work on curves, which was republished in an enlarged form in 1610.
- 13534 — I TRE LIBRI de' SPIRITALI, cioè d'INALZAR ACQUE per FORZA dell' ARIA [tradotti, colle Aggiunte dell' Autore, da JUAN ESCRIVANO]; with vignette on title, and numerous woodcuts, cr. 4to. FINE COPY in brown morocco, with bookplate of Henry B. H. Beaufoy, F.R.S. (RARE), £1. 5s  
*ibidem, a. c., 1606*
- The Italian translation of the *Pneumatica*, first containing the illustration celebrated in the history of the steam engine.
- 'On trouve à la page 75 de cet ouvrage une figure représentant la machine inventée par Porta pour élever l'eau à l'aide de la force élastique de la vapeur, figure dont Fr. Arago a donné un fac-simile dans son *Histoire des machines à vapeur*.'—*Brunet*. There is also an illustration of a thermometer on page 76.
- 'Dans la traduction italienne des *Pneumaticas*, Porta parle des moyens à employer pour connaître en combien d'air se transforme une quantité donnée d'eau. Cet air n'est autre chose que la vapeur, et l'on ne peut se refuser à voir ici un des premières applications faites par les modernes de ce puissant moteur. Au même endroit Porta traite de la raréfaction de l'air par la chaleur, et l'applique à un instrument, qui est une espèce de thermomètre.'—*M. Libri*.
- 13535 **PORTA LEONE** (Abraham [ben David Arie], *Mantuanus, Medicus Hebræus*) De AURO DIALOGI TRES, in quibus non solum de AURI in RE MEDICANA FACULTATE, verum etiam de SPECIFICA eius, et cæterarum Rerum Forma, ac Duplici Potestate, qua mixtis in omnibus illa operator, copiosè disputatur. Cum Licentia SANCÆ INQUISITIONIS, et Illustrissimi Senatūs Veneti; with plate of emblem, sm. 4to. old white vellum (some ll. browned, otherwise a FINE COPY); RARE, £1. 15s  
*Venetis, J. B. à Porta, 1584*
- An iatro-chemical work of importance, in which the author denies that the internal use of gold lengthens life, and containing matters of interest to the historian of chemistry and physics. It was unknown to Poggenдорff, Brunet, Græsse, and other bibliographers.
- 13536 **PORTLOCK** (Major-Gen. Joseph Ellison, R.E., F.R.S.) REPORT on the GEOLOGY of the COUNTY of LONDONDERRY, and of Parts of TYRONE and FERMANAGH, with 38 lithographs of Fossils, 9 folding plates (some coloured), woodcuts, and large coloured map, thick 8vo. cl., 8s Dublin, 1843  
'He was a geologist after my own heart.'—*Sir Rodrick Murchison*.
- 13537 **POSELGER** (Friedrich Theodor; Berlin) Das TAYLORSCHE THEOREM, als GRUNDLAGE der FUNCTIONEN-RECHNUNG, 4to. (pp. 26), *scwv*, 2s  
*[Berlin, 1835]*



- 13539 **PORTER (George Richardson, F.R.S., author of 'The Progress of the Nation')** THE NATURE and PROPERTIES of the SUGAR CANE, with Practical Directions for the IMPROVEMENT of its CULTURE, and the MANUFACTURE of its Products, 6 plates of Machinery, etc., besides woodcuts, Svo. cl., uncut (scarce), 10s 1830
- Written before the abolition of slavery in the British West Indies.  
This edition contains an Appendix (pp. 79) left out in the second, containing Extracts from Reports made to the Agricultural Society of Antigua, Tables of Imports and Exports of Sugar to and from Great Britain, and other information giving interesting statistical details.
- 13540 ——— **SECOND EDITION**, with additional Chapter on the Manufacture of Sugar from BEET ROOT, with 6 plates and 3 woodcuts, Svo. cl., 10s 1843
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- 13541 **PORTER (Samuel, surveyor and engineer to the Stratford-on-Avon Canal)** THE ARTIFICER'S, FARMER'S, and INLAND-NAVIGATOR'S ASSISTANT: shewing by DECIMAL TABLES (at Sight) the most useful Kinds of Admeasurements at any Length, Breadth, or Depth; also an easy and practical Method of Leveling, Surveying, etc., with front. of 'Porter's Balance Level', 4to. hf. bound (back damaged), 7s 6d 1799
- Scarce, and unknown to Watt, Lowndes, Allibone, and others. The 'inland-navigator' was the original form of the present word navy.
- 13542 **PORTER (Henry, M.D., F.G.S.)** THE GEOLOGY of PETERBOROUGH and its Vicinity, with 10 lithographs, post Svo. cl., with inscr. to Prof. James Tennant, 4s Peterborough, 1861
- 13543 **PORTS MARITIMES de la FRANCE:** NOTICE sur le PORT de BOULOGNE, par M. VIVENOT, '74: DIEPPE, par M. LAVOINER, '74: CHERBOURG, par M. DE ST-AMANT, '77: LE HAVRE, par M. QUINETTE DE ROCHEMONT, '75: SAINT-MALO et SAINT-SERVAN, par M. FLOUCAUD DE FOURCROY, '77: ALGER, par M. TRÈVES, '91: DELLYS, par le même, '92; with a large folding plan to each port (except Cherbourg, Saint-Malo, and Saint-Servan), and numerous smaller plans, and diagrams—7 vols. roy. 4to. in 1, hf. morocco neat, £1. 1s Imprimerie Nationale, 1874-92
- 13544 **POŠEPNÝ (Franz)** THE GENESIS of ORE-DEPOSITS (read before the International Engineering Congress, Chicago, 1893), with portrait (inserted), and 12 plates (pp. 173): DISCUSSIONS on the above Paper, with diagrams, 5 papers (pp. 89): BIOGRAPHICAL NOTICE by R. W. RAYMOND (pp. 13)—in 1 vol. Svo. cl. (scarce), 6s 6d [New York, 1893-4]
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- 13545 **POST (J.), et Bernhard NEUMANN:** TRAITÉ COMPLET d'ANALYSE CHIMIQUE appliquée aux ESSAIS INDUSTRIELS, 2<sup>e</sup> Édition française, entièrement refondue, et augmentée par M. PELLET et G. CHENU, Tome II, Fascicule II: SUCRE, Amidon, Dextrose, et Glucose; with 120 illustrations, roy. Svo. sewn, 3s 6d (p. F. 8 nett) 1910
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- 13548 **POTAIN (Le Docteur, ex-chirurgien principal d'armée)** RELATION AÉROSTATIQUE, dédiée à la NATION IRLANDAISE; with fine and large lithographic portrait by Boilly after Bordes, and view of the balloon in mid-air, 4to. (pp. 32), hf. cl., uncut, with the original cover lettered 'Historique d'un Voyage Aérien' bound in (FINE COPY); VERY RARE, £3. 3s 1824
- The above copy contains 'Document et Pièces principales à l'Appui du présent Mémoire' (p. 6), containing the deliberations and correspondence of the Irish Committee, which included the ill-fated Lord Edward Fitzgerald, the Earl of Moira (afterwards Marquess of Hastings), and many other well-known Irishmen.  
The work, as well as the ascent (at Dublin, June 17, 1785), was unknown to Hatton Turnor.
- 13549 **POTT (Johann Heinrich; Berlin)** EXERCITATIONES CHYMICAE, de Sulphuribus Metallorum, de Auripigmento, de Solutione Corporum Particulari, de Terra Foliata Tartari, de Acido Vitrioli Vinoso, et de Acido Nitri Vinoso, sparsim hactenus editæ, jam vero collectæ, restitutæ, a Mendis repurgatæ, variisque Notis, Experimentis et Discussionibus adauctæ, 4to. contemporary calf gilt (fine copy); rare, 12s 6d Berolini, 1738
- 'Stahl's disciple and pupil, Johann Heinrich Pott, enriched chemistry by many valuable observations. . . With regard to the nature of phlogiston itself, he expressed the opinion that it was 'a variety of sulphur.'—Prof. E. v. Meyer.  
'Pott vereinigte eine gründliche Kenntniss der chemischen Wissenschaft, wie sie seiner Zeit vorlag, mit einem rastlosen Streben nach Förderung derselben. Er hatte eine ungemaine Geschicklichkeit in dem praktischen Theile der Chemie, eine unermüdete Ausdauer bei den langwierigsten Untersuchungen; und was er auf diese Weise neu erlangt hatte, theilte er mit einer Offenheit und Klarheit mit, welche für die damalige Zeit hoch anzuschlagen ist.'—H. Kopp.
- 13550 ——— **LITHOGÉOGNOSIE, ou EXAMEN CHYMIQUE des PIERRES et des TERRES en général, et du Talc, de la Topaze, et de la Stéatite en particulier, avec une Dissertation sur le Feu et sur la Lumière. Ouvrages traduits de l'Allemand:** CONTINUATION de la LITHOGÉOGNOSIE PYROTECHNIQUE, où l'on traite plus particulièrement de la Connoissance des Terres et des Pierres, et de la Manière d'en faire l'Examen, 2 vols. 12mo. contemporary French calf gilt, 12s 6d 1753
- The author was a disciple of G. E. Stahl, and in the above work did much to promote a knowledge of chemical analysis. He was the first to treat of bismuth and its compounds, and discovered silicic acid, although it was recognised as such only in 1811 by James Smithson, F.R.S., founder of the Smithsonian Institution.
- 13551 **[POUCHET (Georges)]** ÉCLAIRAGE par la BOUGIE ÉLECTRIQUE [JABLOCHKOFF], des Voies Publiques, des Grands Magasins, Cafés, etc. etc.; with woodcuts, roy. Svo. (pp. 47), sewn, 2s Lille, 1878

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With Jablochkoff lights,

And now I suppose there's a war.'

—Anglo-Indian verses temp. the annexation of Burma.

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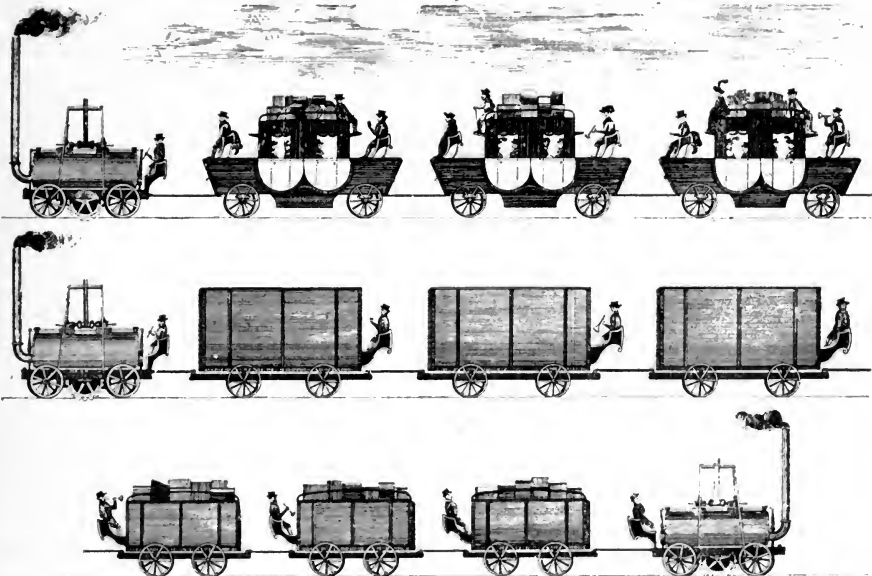
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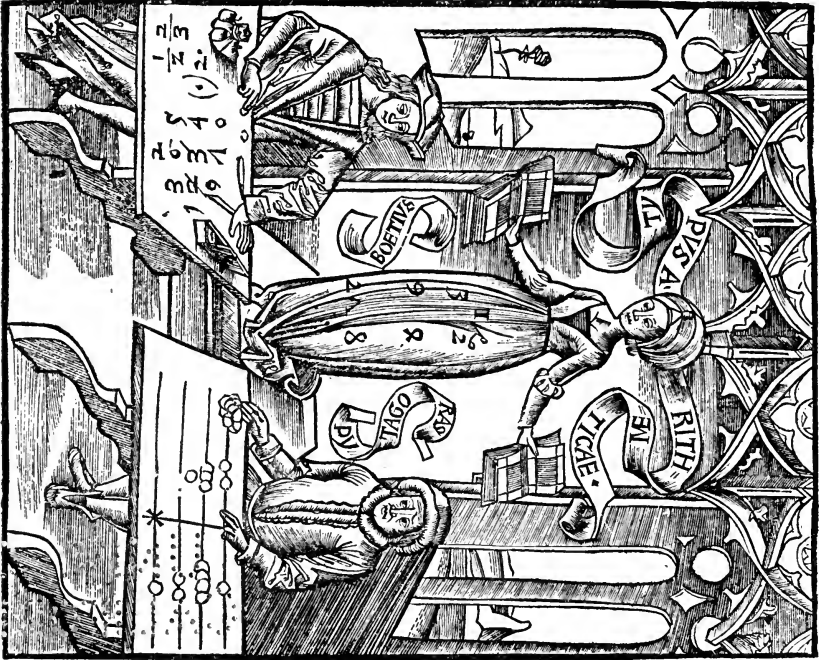
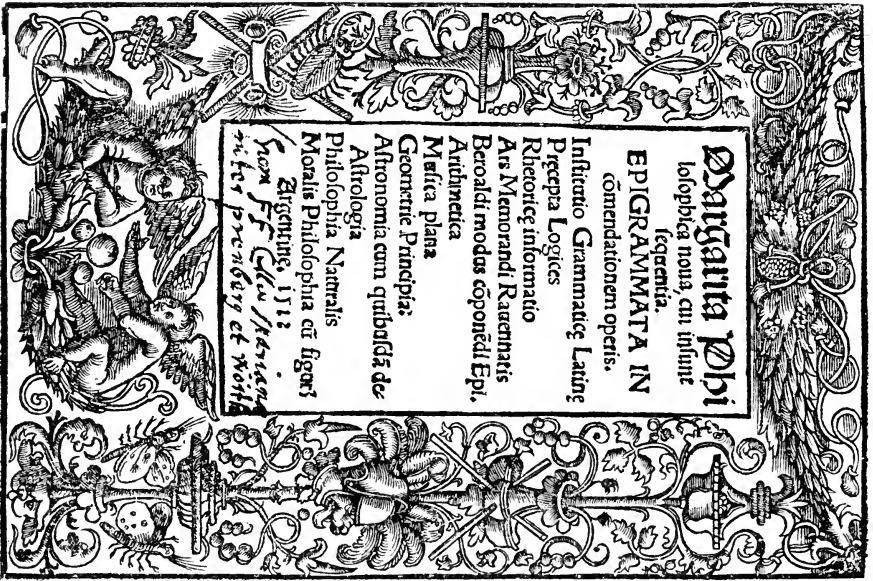
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This book contains a dedication in English to Queen Mary, and another in Latin to Cardinal Pole. D. N. B. erroneously mentions 1551 as the date of the first edition, a statement palpably wrong, as Queen Mary's accession did not take place until 1553, and Cardinal Pole was consecrated Archbishop of Canterbury (the work being dedicated to him as such) only after Abp. Cranmer's execution in 1556.

He was probably the first, certainly one of the first, in England to adopt the Copernican system, which was only put forward as an hypothesis in 1543; though he seems to have thought the world not quite ripe for such a doctrine, and was perhaps afraid to avow it very distinctly. He advises his reader not to rely too much on Ptolemy; but it appears that he had not quite abandoned astrology. . . . In his prefaces, introductions, and conclusions he frequently indulges in very passable poetry (a beautiful and dignified hymn from *The Castle of Knowledge* is quoted in Collier's Bibliographical Account).—D. N. B.

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Nothing is known of the author of the second work, who is not mentioned by Montucla or Poggenorff (who mistakenly attributes the work to Regiomontanus), or in other bibliographies. It forms an appendix to the first work, and is especially interesting for its numerous well-executed woodcuts, which include many on artillery bombarding fortresses, which are still based on the contemporary notion that the projectile travels in a straight line, and after its strength is spent, drops vertically (*v. No. 8212 oute*).

Poggenorff mentions a Johannes Noviomagus (Jan Bronckhorst), 1494-1570), who for some time professed mathematics at Rostock; but there is no evidence to connect him with the above Daniel Santebch Noviomagus.

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Pp. 7-55 contain an excellent introduction to crystallography.

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This treatise on physics, which is still based on Descartes's theory of vortices, was very popular in its time, and contains many interesting experiments.

- 13999 **REGNIER (Edme)** DESCRIPTION et USAGE du DYNAMOMÈTRE, pour connaître et comparer la Force relative des Hommes, celle des Chevaux et de toutes les Bêtes de Trait; enfin pour juger la Résistance des Machines, et estimer les Puissances Motrices qu'on veut y appliquer; with folding copperplate, 4to. (pp. 20), *sewn (rare), 10s 6d* An VI [1798]

Containing the invention of the spring dynamometer for measuring muscular strength, etc. 'Regnier construisit son premier dynamomètre à la demande de Bufon et de Guéneau; de Montbelliard, qui avoient reconnu, pour les recherches qu'ils se proposoient de faire sur la force musculaire, l'imperfection des instruments analogues, précédemment imaginés par G. Graham, Desaguliers et Leroy.'—*Biogr. Gén.*

- 14000 **REICH (Ferdinand, Bergakadem Freiberg)** FALLVERSUCHE über die UMDREHUNG der ERDE, angestellt in dem DREI-BRÜDERSCHACHTE bei FREIBERG; with 5 folding plates, 8vo. *hf. cl. (scarce), 10s 6d* Freiberg, 1832

The author's was the last of the classic series of experiments made by Robert Hooke, G. B. Guglielmini in 1791, and Benzenberg in 1802 (*v. No. 338 oute*) to ascertain the Easterly motion of a falling body, caused by the rotation of the earth. All these experiments 'showed, in addition to the predicted Easterly deviation, also a small Southerly displacement. For this no satisfactory explanation has yet been given' (*Prof. Cajori*).

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This is the work that contains the author's imaginary discovery of *od*, a physical force intermediate between electricity, magnetism, heat, and light, to which the phenomena of hypnosis (then 'mesmerism') are to be due. In its narrower sense it agrees perhaps best with Prof. Forel's *neurckymos*.

The subject may still offer a field of speculation to the scientific mystic in connexion with the undiscovered octaves of ether waves.

It consists of 2 parts, the first treating of 'Physico-Physiological Researches on the Imponderables, in their Relation to the Vital Force', and the second of 'Magnetic or Odyllic Light.'

The author is generally known as the discoverer of *erosote* and paraffin.

- 14003 **REICHENBACH** (Karl Freiherr v.) PHYSICO-PHYSIOLOGICAL RESEARCHES on the DYNAMICS of MAGNETISM, ELECTRICITY, HEAT, LIGHT, CRYSTALLIZATION, and CHEMISM in their Relations to Vital Force, with Preface and Critical Notes by JOHN ASHBURNER, M.D., *with woodcuts*, thick 8vo. *cl.* (*scarce*), 10s 6d 1851  
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It would probably be impossible to bring together a collection of these documents, and the Manuscript should therefore be of importance also to the topographer of Kent and Sussex.
- 14064 ———: A SHORT HISTORICAL ACCOUNT of LONDON-BRIDGE, with a Proposition for a NEW STONE-BRIDGE at WESTMINSTER, as also an Account of some Remarkable Stone-Bridges Abroad, and what the best Authors have said and directed concerning the Methods of Building them, by Nicholas Hawksmoor, first edition, with 5 folding copperplates; with MS. Copies of four Works on Bridge Building (as below), mostly in the autograph of John Rennie—4to. old calf (rare and interesting), £2. 15s 1736  
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'The plates drawn by Hawksmoor and engraved by B. Cole and Toms include 'A Plan of the City of Westminster,' with suggestions as to suitable places for a bridge; 'Propositions for London Bridge to be altered for the Navigation under and the Safety of Passengers over it'; and 'Propositions for a New Bridge at Westminster'. Charles de Labelye made from Hawksmoor's draughts a calculation to estimate the fall of the water at the intended bridge at Westminster, and some conjectures as to the probable effect on the navigation.—D. N. B.  
Nicholas Hawksmoor was the 'scholar' and greatest pupil of Wren, and helped in building St. Paul's. He did much work at Queen's and All Souls Colleges at Oxford, but his most interesting works to Londoners are St. Mary Woolnoth in Lombard St. and his many East End churches under Queen Anne's 'Fifty' scheme, which include St. Anne's, Limehouse, St. George's in the East, and that noble church, Christ Church, Spitalfields.  
The above volume is specially interesting for having belonged to JOHN RENNIE, who afterwards actually built New London Bridge, still the noblest bridge in England. The works added by him are: Memorial concerning Hexham Bridge, by JOHN SMEATON, F.R.S., with a brief Reply by a Freeholder (1782); A Copy of Mr. Myles Opinion and Report to the Magistrates of Northumberland respecting the Practicability of building a permanent Bridge at Hexham; Copy of a Letter to Mr. L. Becker, Director and First Secretary of the Batavian Society for Experimental Philosophy at Rotterdam; Treatise on Rivers and Canals, by THEODORE AUGUSTUS MANN.
- 14065 ———, SPECIFICATION of the MODE of executing the proposed NEW LONDON BRIDGE, as designed by the late, folio (pp. 16), *sewn*, 7s 6d November 13, 1823
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- 14067 ———: SPECIFICATIONS for the KENNET and AVON CANAL, between Foxhanger and Devizes; a neatly written MS. Copy of John Rennie's original Reports, with a few MS. Corrections by the latter, sm. folio, law calf (one joint cracked), 12s 1801  
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This Manuscript was probably written on or immediately after leaving Edinburgh University, when he established a business on his own account as a millwright.



14070 **RENNIE** (Sir John, C.E., F.R.S., P.I.C.E.; *completer of London Bridge and of the Plymouth Breakwater*) **HISTORY OF CIVIL ENGINEERING, AN UNPUBLISHED MS. on over 800 pp., in 12 vols. (v. IV. missing) folio, parchment, £15. 15s** [1839-? 74]

A very interesting Manuscript, which must have formed the basis of Sir John Rennie's presidential address to the Institution of Civil Engineers on the history of Civil Engineering, in 1846. Some of the volumes bear extensive alterations and corrections, the work having evidently been designed for publication. This is borne out by a passage in the author's *Autobiography* (p. 456): 'I also design to write a history of engineering, enlarged from my address to the Institution of Civil Engineers, and a life of my revered father. All these I have already sketched out, and I hope to complete them, if it please God to spare my life a few years longer.' None of these works were carried out, although the author's wish had been granted.

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This would have made the Great Eastern the original 'Great Northern' railway, and lacking endless tunnels a much more comfortable line. But it stuck at Cambridge. It is plain from the above interesting MS. that the first intention of all was to make it join the very early High Peak Railway, which still exists as a mineral line from Buxton to Wirksworth.

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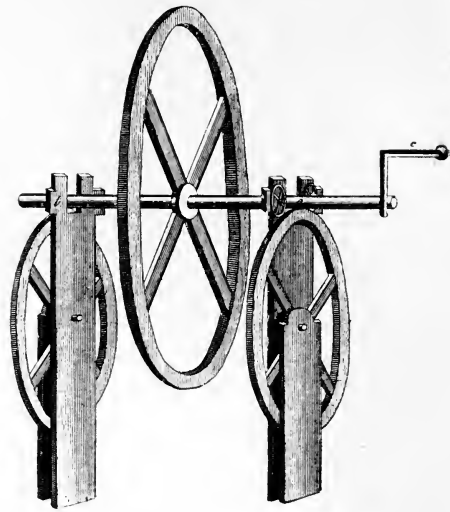
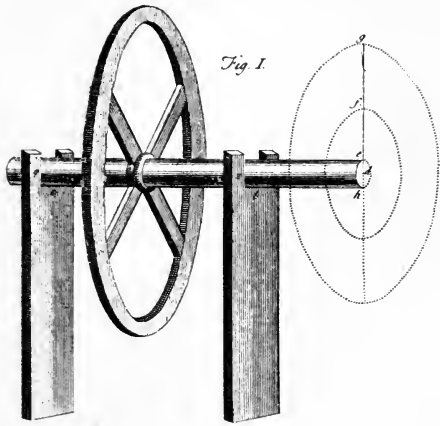
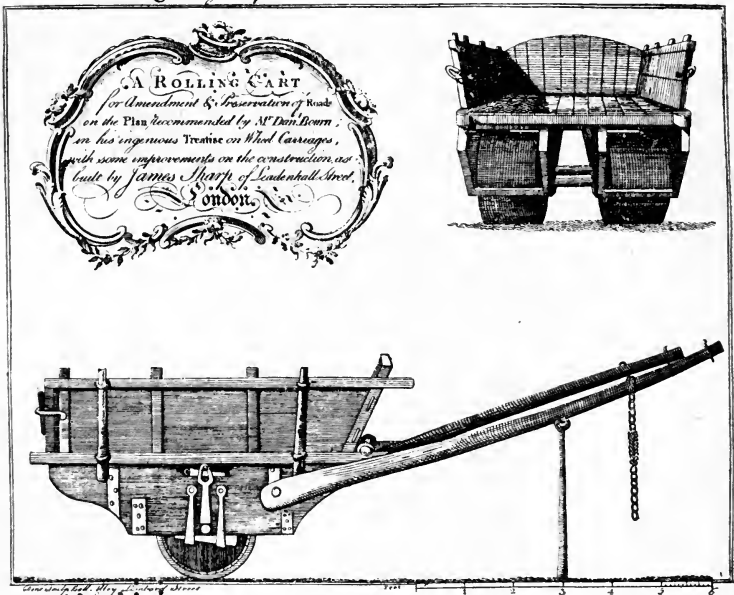


Fig. II.

Gent. Mag. Aug. 1768.



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This important work, unique of its kind, is arranged according to the atomicity of carbon, from C<sub>1</sub> to C<sub>60</sub>, with a Table of Percentages, and an alphabetical Index. The text is in four languages—German, English, French, and Italian.

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This second edition contains an interesting preface dated *Battle*, Oct. 9, 1871, and written in the inventor's 83rd year and 48 years after the publication of the first edition. There are however only 4 plates, instead of the 8 contained in the original edition.  
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Sir John Ross was an undaunted pioneer of steam for the Navy, at a period 'of apathy and indifference to the subject, which has been the baleful consequence of the ridicule that had been cast on the supposition that steam might one day supersede every former mode of warfare' (pp. 4-5).
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There was no copy of this work in the Scott Library.  
Among the trade subscribers to its publication on the titlepage is 'T. Sotheran, York', who came to London and founded the firm publishing the present catalogue in 1816.
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Published to make practically serviceable the 'Method of Finding a Ship's Position at Sea' of Captain T. H. Sumner, Boston, Mass., 1843, and of Commander Thomas Lynn, of the Indian Navy, of ten years earlier.
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At end is: Lettere al . . . Carlo Facassati [con Lettera del Montanari], Risposta alle Opposizione del Signor Geminiano Montanari (pp. 45).  
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This copy fetched £3. 1s at auction in 1905.

This work, which is not noticed by Lowndes or Poggendorff, contains the important suggestion of reducing friction by letting the axle run on the top of friction wheels, which in their turn have axles running on other wheels. This suggestion does not seem to have been adopted, but is undoubtedly the forerunner of ball-bearings. It was however used in the friction wheels of Atwood's machine to reduce friction to a minimum. The work also describes contrivances 'to take off the friction of a truck of any single, double, treble, etc. blocks,' 'to diminish the friction of a pendulum by the application of a single sector,' 'a method of cancelling the friction of all wheel-carriages,' etc. The author also claims that he was the first to discover that friction does not depend on the extent of the surfaces in contact, but on the pressure.

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The author claims to have overcome the difficulty of taking observations in cloudy or misty weather by his Fluid Quadrant, which does not require the observation of the horizon. 'Till the Invention of this Instrument, no Altitudes at Sea could ever be taken to Exactness, nor no Lunar Observations, till now, could ever be exact enough for discovering the Longitude' (p. VIII).

The above work was quite unknown to Watt and Allibone, who only mention the author's 'Wheel Carriages'; nor is there any account of him in *D. N. E.*, or other works of reference.

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The author would cause rain 'by raising electrical conductors to a cloud by means of balloons, withdrawing the surcharge of electricity, and causing rain to fall.' (p. 9) There is no copy of the above pamphlet in the R. Met. Society's Library Catalogue (1891).

14534 ——— ELECTRIC METEOROLOGY: a Letter to the Earl of Carnarvon on the CAUSE of RAIN, Storms, the Aurora and Terrestrial Magnetism; also a Paper on the Excavative Force in Dynamite Explosions, and on the Nature of Gases, with folding chart and plate, 8vo. *cl.*, 8s 6d privately printed, Oxford, 1887

Bound up with the above are numerous pamphlets and brochures by the author on the same subject, published between 1866 and 1888.

14535 ——— ESSAY on the CAUSE of RAIN and its allied Phenomena, with folding chart, 8vo. *cl.*, 5s *ibidem*, 1859

The author objects to the cyclonic theory of storms, and advances one of his own, mainly based on the quantity of atmospheric electricity.

He was a very interesting personality. A native of Oxford, he was the son of a cabinet maker, to which trade, and that of a paperhanger, he was brought up, while his parents at the same time excited in him a passion for meteorology and astronomy. Befriended by Professor Baden Powell (*q. v. ante*), he eventually became an assistant at the new University Museum, and pursued his scientific interests till he died an old man in 1892.

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- 'The important merit which this invention possesses consists in its taking advantage of the chemical composition of the lithographic stone, and the chemical nature of its printing. . . . The chief feature in lithography will in future be the remarkable ease with which great power, depth, and brilliancy of tone, together with a variety of texture, can be attained.'—Pp. 1-2.
- 14712 **SCHERFFER (Carl; s.J., Univ. Vienna)** NEUE VERBESSERUNG DIOPTRISCHER FERNRÖHREN, welche ohnlängst von dem berühmten DOLLOND in England sind erfunden worden, aus dem Lateinischen übersetzt; with copperplate, 4to. (pp. 36), sewn, 5s Leipzig, 1764
- The earliest German account of John Dollond's great invention of the achromatic telescope.
- 14713 **SCHMEISSER (Johann Gottfried)** SYLLABUS of LECTURES on MINERALOGY, 8vo. (pp. 155), sewn, 3s 6d 1794

- 14715 **SCHEFFER (Henrik Theophilus)** CHEMISCHE VORLESUNGEN über die Salze, Erdarten, Wässer, entzündliche Körper, Metalle und das Färben, gesammelt, in Ordnung gestellt und mit Anmerkungen herausgegeben von TOBERN [OLOF] BERGMANN [*sic*], aus dem Schwedischen übersetzt von CHRISTIAN EHRENFRIED WEIGEL; with 5 folding plates, and 2 folding tables on copper, sm. 8vo. (pp. 752), *sewn (rare)*, 10s 6d  
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- The author was the first to explain correctly some of the properties of platinum, and to ascertain the quantitative composition of a few chemical compounds. He was a supporter of the phlogiston theory, and advanced an hypothesis ascribing to the phlogiston negative weight.
- The above is the only translation of the Swedish original ever published in any language.
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*Ubsalia, Joh. Jansson, 1654*
- 14717 — ANOTHER COPY, printed on stouter paper, but without the 3 copperplates, 4to. *old vellum (back of binding damaged, otherwise a FINE COPY)*, with bookplate of Patrick Hume, first Earl of Marchmont, 1702, £1. 1s
- This is next to Snellius's (v. No. 4484 *ante*) the earliest work on the naval arts of the ancients. It is chiefly collected from the Greek and Roman Classics, and treats the subject far more fully than that of Snellius, which is more exclusively devoted to navigation, while the present work treats more especially of naval architecture.
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- 14719 — PRATICA del PARALLELOGRAMMO da DESIGNARE del P. CHRISTOFORO SCHNEINER, della Compagnia di Gesuiti, di nuovo data in Luce da GIULIO TROILI alias Prencipe Pittore da Spilimbertò; with 2 plates, sm. 4to. *sewn (one l. slightly damaged)*, 8s  
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 'Mechanische Regeln zur Bewerkstellung uberraschender, auf den ersten Blick nicht erklärlicher, optischer Erscheinungen, mit vielen für die Geschichte der Optik wichtigen Bemerkungen machen den Hauptinhalt dieses bekannten Werkes aus.—*Wilde's Geschichte der Optik*, where a full account of the work will be found on pp. 296-306. It was reprinted, without alterations, in 1677.
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FIRST EDITION of this important work, which went through several editions, and contains the author's discovery, independently of Cataldi, of continued fractions.

\*Schwenter's praktische Geometrie erfernte sich einer Beliebtheit welche ein Eingehen auf ihren Inhalt empfehlen müsste, selbst wenn wir nichts von Bedeutung ihr zu entnehmen hätten. . . . In Tractatus I lehrt er die verschiedenartigsten theils genaue, theils nur angenäherte Konstruktionen, wie sie bei Dürer, bei Clavius u. s. w. sich finden, auch einige neue Verfahrsmethoden. . . . Im Tractatus III hat er den Messtisch, welchen sein Lehrer erfunden, und zu dessen Gebrauch er während des Unterrichtes die nöthige Anweisung gegeben hatte, ohne eine ausführliche Beschreibung desselben zu veröffentlichen, nachträglich zur allgemeinen Kenntniss gebracht und dadurch dem allgemeinen Nutzen einen wesentlichen Dienst erwiesen.—*Prof. Cantor.*

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Wien, 1895
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Kiew, 1868

\*La thèse principale du présent mémoire consiste à prouver, qu'il existe dans la nature deux espèces de matière créée: la matière pondérable et l'éther. L'une et l'autre ont pour cause fondamentale la force répulsive, formulée par l'impenetrabilité. La force, relative à la matière pondérable, agit en raison inverse des cubes des distances; l'autre est réciproque aux cinquièmes puissances.—*Préface.*

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15046 **STEVENSON [hic STEPHENSON] (William; father of Mrs. Gaskell)** The SYSTEM of LAND SURVEYING at present adopted by Surveyors and Commissioners in old and new INCLOSURES, conducted as an Actual Survey, on a Plan consisting of Open Fields, Ings, and Common and Old Inclosure; with Rules shewing how Lines may be Measured where there are Impediments, or not, to obstruct the Sight, etc. etc.; 2nd Edition, with 6 plates (3 folding), folding map, and Field Book. 4to. boards, 5s 1810

15047 **STEVENSON (William Ford, F.R.S., F.S.A.)** The COMPOSITION of HYDROGEN and the NON-DECOMPOSITION of WATER Incontrovertibly ESTABLISHED, in Answer to the Award of a Medal by the ROYAL SOCIETY, whereby the Contrary Doctrines are Absolutely Affirmed; also the ABSURDITY of the EXISTING SYSTEMS of ELECTRICITY and MAGNETISM Demonstrated and the True ones given; 2nd Edition, revised with important Additions, 8vo. cl. (scarce), 12s 1849

The author tries to prove that water is an element, and not a chemical compound as first proved by Lavoisier in 1783. According to him water is non-decomposable, while hydrogen is a chemical compound of electricity and water.

15048 [—] MOST IMPORTANT ERRORS in CHEMISTRY, ELECTRICITY, and MAGNETISM, pointed out and refuted; and the Phenomena of Electricity, and the Polarity of the Magnetic Needle accounted for and explained, by a FELLOW of the ROYAL SOCIETY, 8vo. (pp. 47), sewn (scarce), 10s 6d 1846

A scientific paradox by a Fellow of the Royal Society! and perhaps most remarkable for the ignorance displayed by the author.

- 15050 **STEVENSON (Alan, M.I.C.E., F.R.S.E.; uncle of R. L. S.)** ACCOUNT OF THE SKERRYVORE LIGHTHOUSE, with Notes on the ILLUMINATION OF LIGHTHOUSES, with 33 steel plates, 117 woodcuts and diagrams, and folding map, impl. 4to. cl., with author's inscr., 12s (p. £3. 3s) *Edin.*, 1848  
The third of the great triplet of early lighthouses which fascinated our youthful imagination—the Eddystone, the Bell Rock, and the Skerryvore, and in the wildest situation of them all.  
‘It still remains a standard book . . . He designed and carried out ten lighthouses, including Skerryvore lighthouse tower, the finest example for mass, combined with elegance of outline, of any extant rock tower. This tower, which is exposed to the full fetch of the Atlantic, is built on a rock 14 miles from the nearest land, the island of Tyree. The work was begun in 1838, but a storm swept away the temporary barrack, and another had to be erected in its place. The foundations of the tower involved the excavation of 2000 tons of material. . . . The tower rises to a height of 138 ft., is 42 ft. in diameter at the base, gradually decreasing to 16 ft. at the top.’—*D. N. B.*
- 15051 ——— EXTRACTS from REPORTS on the NEW DIOPTRIC LIGHT of INCHKEITH, to a Committee of the Commissioners of Northern Lights, appointed to consider the Subject of Illumination by means of Lenses, 4to. (pp. 7), *unbound, with MS. note by George Rennie, F.R.S., 2s 6d ibidem*, 1835
- 15052 ——— LETTERS to the Author of an Article on the ‘BRITISH LIGHT-HOUSE SYSTEM’, in Number CXV of the Edinburgh Review, with 2 diagrams, 8vo. (pp. 32), *sewn, 3s ib.*, 1833
- 15053 ——— ANOTHER COPY, together with: MEMORIAL and STATEMENT relative to the Light-Houses erected on the Northern Parts of Gt. Britain; and relative to a Proposal for Erecting a Light-House on the Bell or [Inch] Cape Rock (pp. 38), *ib.*, 1803: **BROWN (Capt. Sir Samuel, R.N.)** Description of a Bronze Columnal Light House, with References to a Model of one-fourth the full Size, designed for the Wolf Rock, situate between the Island of Scilly and the Land’s-End, or the Skerry Vore, on the West Coast of Scotland, which may be adapted for various other Insulated Rocks, etc. etc., with Observations on the Principle and Construction of the present Marine Light Houses (pp. 15). with author's inscr. to George Rennie, F.R.S., Brighton, 1835: ——— REVISED EDITION, with 3 plates (pp. 25), *Edin.*, 1835—in 1 vol. 8vo. *hf. calf, with inscr. ‘From the Author’ on first work, 10s 6d* 1803-35
- 15054 ——— REPORT to the COMMITTEE of COMMISSIONERS of NORTHERN LIGHTS, appointed to take into Consideration the Subject of ILLUMINATING the LIGHTHOUSES by Means of LENSES, with 6 plates (4 folding), 4to. *hf. roan, 7s 6d privately printed, Edin.*, 1835
- 15055 ——— ANOTHER COPY, with EXTRACTS from REPORTS on the NEW DIOPTRIC LIGHT of INCHKEITH, to the Commissioners of Northern Lights (pp. 7)—2 vols. 4to. in 1, *hf. roan (back damaged), with author's inscr., 10s 6d*  
A description of the optical apparatus afterwards adopted for the Skerryvore Lighthouse. It was ‘dioptric revolving, the most complete apparatus which had hitherto been constructed. . . . Instead of Fresnel silvered mirrors below the lenses Stevenson designed prismatic rings, which were introduced for the first time in this apparatus. . . . He introduced prismatic rings above and below the central belts, thus securing equal distribution of light all round, and extending dioptric action throughout the whole height of the apparatus. He also suggested the spherical mirrors placed on the landward arcs of dioptric apparatus.’—*D. N. B.*
- 15056 ——— RUDIMENTARY TREATISE on the HISTORY, CONSTRUCTION, and ILLUMINATION of LIGHTHOUSES, with 13 plates, and 104 woodcuts: **Wiggins (John)** THE PRACTICE OF EMBANKING LANDS from the SEA, treated as a Means of Profitable Employment of Capital, with diagrams.—2 vols. fcap. 8vo. in 1, *hf. morocco (o. p.), 5s* 1850-2
- 15057 **STEVENSON (David, M.I.C.E., F.R.S.E.; uncle of R. L. S.)** CANAL and RIVER ENGINEERING, being the Article ‘Inland Navigation’ from the eighth Edition of the Encyclopædia Britannica, with 2 folding plans and 24 woodcuts, large post 8vo. cl., with author's inscr., 3s 6d *Edin.*, 1858
- 15058 ——— The PRINCIPLES and PRACTICE of CANAL and RIVER ENGINEERING, second Edition [greatly enlarged], with 16 plates (4 folding), and 66 woodcuts, roy. 8vo. cl. (cover slightly damaged), 7s 6d *ibidem*, 1872  
An enlargement of the author's ‘Remarks on the Improvement of Tidal Rivers’ (*q. v. infra*). The first edition was published as ‘Canal and River Engineering’ (*q. v. supra*).
- 15059 ——— ON the RECLAMATION and PROTECTION of AGRICULTURAL LAND, with 12 woodcuts, large cr. 8vo. cl., with author's inscr., 2s 6d *ib.*, 1874
- 15060 ——— REMARKS on the IMPROVEMENT of TIDAL RIVERS, with 2 plates (1 folding), roy. 8vo. boards (scarce), 6s 6d 1845
- 15061 ——— ANOTHER COPY, cl., with author's inscr., 7s 6d  
‘Describing the works specially necessary for the improvement of the three parts, sea proper, tidal, and river proper, into which he showed that rivers must be divided.’—*D. N. B.*
- 15062 ——— SKETCH of the CIVIL ENGINEERING of NORTH AMERICA; comprising Remarks on the Harbours, River and Lake Navigation, Lighthouses, Steam-Navigation, Water-Works, Canals, Roads, Railways, Bridges, and other Works in that Country, with 14 steel plates (5 folding), folding map, and 32 woodcuts, 8vo. cl. (cover slightly damaged), 4s 6d 1838  
‘A highly instructive and valuable volume.’—*McCulloch's Literature of Political Economy.*
- 15063 ——— TREATISE on the Application of MARINE SURVEYING and HYDROMETRY to the Practice of CIVIL ENGINEERING, with 13 plates (1 folding), coloured folding map, and 16 woodcuts and diagrams, roy. 8vo. cl. (back slightly damaged), 7s 6d *Edin.*, 1842  
‘While a pupil [with a firm of millwrights] he conducted extensive land and marine surveys, in the almost entire absence of trustworthy charts and maps, and made tidal and other hydrometric observations for lighthouses, piers, harbours, docks, and for river and estuarial improvements. His results he published in ‘The Application of Marine Surveying,’ etc. (1842), the first book of its kind.’—*D. N. B.*
- 15064 ——— (—— and Thomas) REPLY to SIR DAVID BREWSTER'S MEMORIAL to the Lords Commissioners of Her Majesty's Treasury, on the NEW SYSTEM of DIOPTRIC LIGHTS, 8vo. (pp. 23), *sewn, 3s 6d ib.*, 1859
- 15065 ——— ANOTHER COPY, with the Appendix (pp. 12). 2 vols. 8vo. *sewn, 5s ib.*, 1859-60  
An answer to ‘gross misrepresentations made by Sir David Brewster, and to his alleged claim of being the inventor of the polyzonal lens, and its application to lighthouses.’

- 15067 **STEVENSON (Robert, F.R.S.E.; father of Alan, David, and Thomas Stevenson, and grandfather of R. L. S.)** ACCOUNT OF THE BELL ROCK LIGHT-HOUSE, including the Details of the Erection and Peculiar Structure of that Edifice; with a [*sic*] Historical View of the Institution and Progress of the Northern Light-Houses, with *fine frontispiece after TURNER (on India paper), and 21 copperplates, roy. 4to. hf. roan, uncut, with visiting card of George Rennie, F.R.S., and presentation inser. to him from the Commissioners of the Northern Light-Houses (SCARCE), £1. 5s (p. £5. 5s)*  
Edin., 1824
- 'The most important of his light-houses was the famous Bell Rock tower, erected on a dangerous cliff submerged by every tide to the depth of twelve feet. . . . Previous attempts [after the Abbot of Aberbrothock's bell had been sunk by Ralph the Rover] made by Capt. Brodie to erect beacons upon it had failed. . . . The tower rises to a height of 100 ft.; the diameter of the base is 42 ft., diminishing to 15 ft. at the top. . . . The cubic contents of the tower are more than double those of the Eddystone, from which it differs in many respects owing to its far more difficult and dangerous site. . . . The optical apparatus consisted of parabolic reflectors of silvered copper, combined with argand burners, arranged on a four-sided frame, the best and most complete apparatus then known; and, as a means of further distinguishing the light, it showed red and white alternately, hence Sir Walter Scott's 'ruddy gem of changeful light'.'—D. N. B.

- 15068 ——— OBSERVATIONS ON THE ALVEUS or General Bed of the GERMAN OCEAN and BRITISH CHANNEL, 4to. (pp. 7), *unbound, with author's inscr., and addressed, to George Rennie, F.R.S., 4s*  
[1816]

'His 'Alveus of the German Ocean' is frequently quoted by geologists.'—D. N. B.

- 15069 ——— REPORT relative to a Line of CANAL on ONE LEVEL between the Cities of EDINBURGH and GLASGOW, to form a Junction with the Forth and Clyde Canal at Lock No. 20, and also with the Port of Leith, and the Broomielaw at Glasgow, with *folding map, 4to. (pp. 36), sewn, 4s*  
Edin., 1817

- 15070 ——— ROADS and HIGHWAYS: communicated to the Editor of the Edinburgh Encyclopædia, with *plate, 4to. (pp. 12), sewn, 3s 6d*  
*ibidem, 1824*

'He proposed to use stone tracks as a 'smooth and durable city road'.'—D. Stevenson.

- 15071 ——— : STEVENSON (David, F.R.S.E.) LIFE OF ROBERT STEVENSON, with *bust portrait, 12 plates, and 20 woodcuts, 4to. cl., 6s (p. £1. 1s)*  
*ib.*, 1878

- 15072 ——— : MEMORIAL of the COMMISSIONERS appointed by Act of Parliament for ERECTING LIGHTHOUSES in the NORTHERN PARTS of GT. BRITAIN, relative to the Erection of a Lighthouse on the [INCH] CAPE or BELL ROCK, 8vo. (pp. 57), *sewn, 3s 6d*  
*ib.*, 1806

- 15073 **STEVENSON (Thomas, M.I.C.E., F.R.S.E.; father of Robert Louis Stevenson)** THE DESIGN and CONSTRUCTION OF HARBOURS, with *10 plates and 32 woodcuts, 8vo. cl., with author's inscr., 4s*  
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- 15074 ——— ANOTHER COPY; with: CALVER (Edward Killwick, R.N.) THE CONSERVATION and IMPROVEMENT OF TIDAL RIVERS, considered principally with Reference to their Tidal and Fluvial Powers, with *28 woodcuts and coloured folding plan—2 vols. 8vo. in 1, hf. calf (rubbed), 7s 6d*  
*ibidem, 1864—London, 1853*

A reprint, with many additions, of the article 'Harbours' in the eighth edition of the Encyclopædia Britannica.

- 15075 ——— LIGHTHOUSE ILLUMINATION: a Description of the HOLOPHOTAL SYSTEM, and of Azimuthal-Condensing, and Apparent Lights, with other Improvements, with *4 plates, and 53 woodcuts, 8vo. boards, with author's inscr., 7s 6d*  
1859

'His crowning invention was his 'azimuthal condensing system of lighthouse illumination.' No attempt had previously been made to allocate the auxiliary light in proportion to the varying lengths of the different ranges and the amplitudes of the arcs to be illuminated, or, where a light had to show all round the horizon, to weaken its intensity in one arc, and with the rays so abstracted to strengthen some other arc, which from its range being longer required to be of greater power.'—D. N. B.

A possible hindrance to German success in world-domination may exist in a certain limitation in the national mentality, which while allowing to the Statebound scientist much success in poisoning and other arts of destruction, has not tended to the development in one family of such brilliant gifts in the arts of peace and the realm of the imagination as those with which mankind was endowed in eighty years from Robert to Robert Louis Stevenson.

- 15076 **STEVINUS (Simon, de Bruges)** ŒUVRES MATHÉMATIQUES, où sont insérées les MÉMOIRES MATHÉMATIQUES; le tout revu, corrigé, et augmenté par ALBERT GIRARD; with *numerous woodcuts and diagrams, large folio, contemporary white vellum (RARE), £2. 10s*  
Leyde, B. et A. Elsevier, 1634

The most complete edition of the author's works, containing: Arithmétique; Algèbre de Diophante d'Alexandrie; Pratique d'Arithmétique, contenant les Tables d'Interest, la Disme, et un Traicté des Incommensurables Grands; Cosmographie (Doctrine des Triangles, Géographie, Astronomie); Pratique de Géométrie; Art Ponderaire ou Statique; Optique; Castramétation; Fortification par Escuses; Fortification.

'Il a employé dans ces recherches des artifices mathématiques qu'on peut considérer comme un premier achèvement vers le calcul infinitésimal, et donné un des meilleurs traités de navigation, qui a servi de texte dans toutes les écoles chez les nations maritimes.'—Van de Weyer.

- 15077 ——— HYPOMNEMATA MATHEMATICA, à Belgico in Latinum à WIL[LEBRORDO] SN[ELLIO] conversa; with *woodcuts and numerous diagrams, 3 vols. folio in 1, old limp white vellum (SOUND COPY); RARE, £2. 2s*  
*ib.*, J. Patius, 1608

The first collected edition of the author's works, including: Doctrinae Triangulorum de Sinuum Canonibus Fabricandis; de Triangulis Planis; de Sphaericis Triangulis; Libri VI Geographiæ (Canones Loxodromici, de Histiodromia, de Theoria Maritimum Estuuum, etc.); de Cæli Motu.

- 15078 ——— PROBLEMATUM GEOMETRICORUM Libri V, editio princeps, with *vignette on title and numerous diagrams, 4to. old half binding (somewhat waterstained); extremely rare, £2. 10s*  
Antverpiæ, Joa. Bellerus [1583]

This work, which had never been reprinted, was unknown to Poggendorff, Brunet, and other bibliographers.

Prof. M. Cantor (*Vorlesungen üb. Gesch. d. Math.*, Bd. II p. 528), who mentions 'die bei der unauflösbaren Grenzenden Seltenheit' of the original editions, was also unable to see the above work. A description of it is given by M. Steichen (v. No. 15083 *infra*), who complains that 'il est déplorable de voir l'histoire des sciences rester muette encore une fois sur ce beau travail.'

- 15079 ——— : STEICHEN (Michel) MÉMOIRE sur la VIE et les TRAVAUX de SIMON STÉVIN; with *5 folding plates, 8vo. boards (back damaged), 3s*  
Brucelles, 1846

- 15081 **STEVINUS** (*Simon, de Bruges*) ARITHMETIQUE, reveuë corrigee et augmentee de plusieurs Traictez et Annotations par ALBERT GIRARD; with fine engraved title and diagrams, thick 8vo. contemporary white vellum (somewhat browned, but a FINE COPY); very rare, £2. 15s

Leide, de l'Imprimerie des Elzeviers, 1625

This edition contains the author's Arithmétique théorique, first published in 1585, his 'Arithmétique pratique', and 'Les Six Premiers Livres d'Algèbre de Diophante d'Alexandrie, dont les quatre premiers sont traduits et expliqués par Simon Stevin, et les deux derniers par Albert Girard.'

In it appeared first 'La Pratique d'Arithmétique' (pp. 695-822), La Disme, enseignant facilement expédier par nombres entiers sans rompuz, tous comptes se rencontrent aux affaires des Hommes' (pp. 823-49), and 'Traicté des Incommensurables Grandsurs, avec Appendice de l'explication du 10<sup>e</sup> livre d'Euclide' (pp. 850-85).

'La Disme' contains, according to Prof. de Morgan, 'the first announcement of the use of decimal fractions.'

'He introduced in his Arithmetic exponents to mark the power to which quantities were raised . . . He further suggested the use of fractional (but not negative) exponents, and a decimal system of weights and measures. His geometry is ingenious . . . Some theorems on perspective are enumerated.'—*W. W. R. Ball*.

- 15082 — De BEGHINSELEN der WEEGHCONST: De WEEGHDAET: De BEGHINSELEN des WATERWICHTS; all first editions, with vignette on titles, and numerous woodcuts and diagrams, 3 vols. sm. 4to. in 1, old white vellum (first title slightly soiled, and a few slight water-stains, otherwise FINE COPIES); excessively rare, £7. 15s

ibidem, CHRISTOFFEL PLANTIJN, 1586

- 15083 — THE SAME, 3 vols. in 1, hf. citron calf, as good as new (neat library stamp on third title, otherwise remarkably fine and exceptionally tall copies), £9. 9s

'It is however on his *Statics* and *Hydrostatics*, published (in Flemish) at Leyden in 1586, that his fame rests. In these works he enunciates the triangle of forces—a theorem which some think was first propounded by Leonardo da Vinci. Stevinus regards this as the fundamental proposition of the subject. Previous to the publication of his work the science of statics had rested on the theory of the lever, but subsequently it became usual to commence by proving the possibility of representing forces by straight lines, and thus reducing many theorems to geometrical propositions, and in particular to obtaining in this way a proof of the parallelogram (which is equivalent to the triangle) of forces . . . Stevinus also found the force which must be exerted along the line of greatest slope to support a given weight on an inclined plane—a problem the solution of which had been long in dispute. He further distinguishes between stable and unstable equilibrium. In hydrostatics he discusses the question of the pressure which a fluid can exercise, and explains the so-called hydrostatic paradox.'—*W. W. R. Ball*.

A full account of this classic of statics will be found in Prof. E. Mach's 'Science of Mechanics.' The above original editions are excessively rare, the work being generally quoted by historians of mathematics from the Latin translation in the reprint in *Hypomnemata Mathematica*.

- 15084 **STIFEL** (*Michael*) ARITHMETICA INTEGRÆ, cum Præfatione PHILIPPI MELANCHTHONIS, editio princeps; with numerous diagrams, thick sm. 4to. old calf (back of binding damaged, title mounted, and a few wormholes in blank margin, nevertheless a SOUND COPY); very rare, £5. 5s

Norimberge, apud Johan. Petreum, 1544

'The first two books deal with surds and incommensurables, and are Euclidean in form. The third is on algebra, and is noticeable for having called general attention to the German practice of using the signs + and - to denote addition and subtraction. . . . It used to be said that Stifel was the real inventor of logarithms, but it is now certain that this opinion was due to a misapprehension of a passage in which he compares geometrical and arithmetical progressions. Stifel is said to have indicated a formula for writing down the coefficients of the various terms in the expansion of  $(1+x)^n$  if those in the expansion of  $(1+x)^{n-1}$  were known.'—*W. W. R. Ball*.

- 15085 **STILLMANN** (*Thomas Bliss*) ENGINEERING CHEMISTRY: a Manual of QUANTITATIVE CHEMICAL ANALYSIS for the Use of Students, Chemists, and Engineers, 3rd Edition [enlarged], with 139 illustrations, 8vo. cl., 9s (p. 19s nett)

Easton, Pa., 1905

- 15086 **STIRLING** (*James, F.R.S.*) LINEÆ TERTII ORDINIS NEUTONIANÆ, sive Illustratio Tractatus D. NEUTONI de Enumeratione Linearum Tertii Ordinis, cui subjungitur, Solutio trium Problematum; with numerous diagrams, and view of Sheldonian Theatre on title, 8vo. old calf (joints cracked), with auto. of Michael Fryer (VERY RARE), £1. 5s

Oxonice, 1717

'It supplied four additional varieties to Newton's seventy-two forms of the cubic curve.'—*D. N. B.* The work forms a necessary supplement to Newton's *Enumeratio Linearum III. Ordinis* (v. Nos. 12572-3 ante). It contains a long list of subscribers, including Sir Isaac Newton. A note by Michael Fryer (1806) on the flyleaf states: 'Extremely rare—cost me £1. 1s. M. F.'

- 15087 — METHODUS DIFFERENTIALIS: sive Tractatus de SUMMATIONE et INTERPOLATIONE SERIERUM INFINITARUM, editio princeps; with diagrams, 4to. large and sound copy in contemporary calf gilt (name cut off title); very rare, £2.

Londini, 1730

- 15088 — ANOTHER COPY, contemporary calf, with bookplate of, and MS. notes by, Philip 2nd Earl Stanhope, F.R.S. (fine copy), £2. 2s

- 15089 — EDITIO SECUNDA; with diagrams, 4to. hf. calf (joints cracked), with bookplates of [SIR] GEORGE PREYMAN [TOMLINE], Bp. of Winchester, William Pitt's tutor and biographer, and Prof. Lloyd Tanner, F.R.S. (RARE), £1. 10s

ibidem, 1764

- 15090 — THE DIFFERENTIAL METHOD: or a Treatise concerning Summation and Interpolation of Infinite Series, translated, with the Author's Approbation, by FRANCIS HOLLIDAY, with diagrams, 1749: The TWO BOOKS of APOLLONIUS PERGEUS, concerning TANGENCIES, as they have been restored by Franciscus Vieta and Marinus Ghetaldus, with a Supplement by JOHN LAWSON, pr., with 6 plates, Cambridge, '64—2 vols. 4to. in 1, hf. bound (first title mounted), with autos. of Michael Fryer and Samuel Roberts, F.R.S., and MS. notes by the former (VERY RARE), £1. 15s

1749-64

This work is of importance in the history of the differential calculus, as having been the first to give the proof of what is known as 'Maclaurin's theorem' (v. Nos. 2761-3, ante); but, save for Montucla, who gives a full account in his *Histoire des mathématiques*, v. III, pp. 223-7, and Cantor (*Vorlesungen üb. Gesch. d. Mathematik*, Bd. III pp. 625-30), the work is curiously enough almost unnoticed in modern histories of mathematics.

'La première partie de cet ouvrage a pour objet la sommation des suites dans lesquelles chaque terme est formé du précédent, multiplié par une fonction rationnelle de son rang. Un grand nombre des résultats sont fort intéressants . . . Ses recherches présentent quelque utilité dans certaines questions spéciales dépendant du calcul des probabilités.'—*M. Marie*.

- 15091 **STREETER** (*Edwin William*; *Jewellers*) GOLD: Legal Regulations for the Standard of Gold and Silver Wares in different Countries of the World, translated and abridged from the Work of A. v. STUDNITZ by MRS. BREWER, with Notes and Additions; 6th Edition, enlarged, with 2 coloured plates, and map, post 8vo. cl. (scarce), 8s

1878



15093 **STOCKMAN** (Bernardus, *certyts Fransoysche Schoolm<sup>r</sup>. tot Dordrecht*) ARITHMETICA, met Tafelken om te rebatteren, door ABEL W. WASSENAER, van nieus oversien, gecorrigeert en verbeteret; *engraved title with portrait*, 12mo. *old vellum (rare)*, 12s 6d Amsterdam, 1648

This work was unknown to Prof. de Morgan, Poggendorff, and other bibliographers. It contains much on commercial arithmetic.

15094 **STÖFFLER** (Johann; *Univ. Tübingen*) CALENDARIUM ROMANUM MAGNUM [in fine: ABACUS REGIONUM, Principatuum, Ducatum, Satrapiarum, Marchiarum Comitatum, Prouinciarum, Insularum, Peninsularum, et Oppidorum nobiliorum, aut cognobiliorum per totam feram Europam; *title surrounded by woodcut border of arms, and numerous fine woodcut initials; the second part printed in red and black, with beautiful woodcut vignettes representing the seasons, fortified towns, etc.* [col.:] *Oppenheim per Jacobum Köbel*, 1518: RUDIMENTA MATHEMATICA, hæc in duos digeruntur Libros, quorum prior GEOMETRIÆ tradit Principia seu Prima Elementa, unam cum Rerum et uariarum Figurarum Dimensionibus. Posterior uero omnigenum HOROLOGIORUM docet DELINEATIONES, autore **Sebastiani Munstero**; *with folding plate, and numerous large and fine woodcuts and diagrams* [col.:] *Basilee in officina Henrichi Petri*, 1551—2 vols. folio in 1, *old calf gilt, with arms on sides (binding rubbed and back damaged, but SOUND AND TALL COPIES)*; **very rare**, £7. 7s 1518-51

The above edition of the first work is according to Houzeau and Lancaster (*Bibliographie de l'Astronomie*) 'fort rare. Ouvrage remarquable comme exécution typographique, imprimé en rouge et noir, orné dans toute son étendue de superbes initiales et d'enjolivements. Les colonnes de la table des lieux se terminent par de charmantes vues de villes: il y en a 24. La seconde partie, contenant le calendrier proprement dit, offre à côté de chaque mois le signe du zodiaque, et au bas les attributs propres aux différentes époques de l'année; il y en a également 24, gravés sur bois par un maître de l'école de Francfort. Vient ensuite le tableau des éclipses de Soleil et de Lune, depuis 1518 jusqu'en 1575, au nombre de 63, avec diagrammes pour toutes. A la fin, une table de la Lune, le quadrant, le cadran solaire et l'instrument pour déterminer les heures temporaires, fort bien exécutés, dans toute la grandeur de la page.'

The second work is valuable for its treatise on dialling (pp. 74-243), one of the earliest works on the subject.

15095 ——— **ÉLUCIDATIO FABRICÆ USUSQUE ASTROLABII**, cui multa et diligens accessit Recognitio, unam cum Schematum Negotio accommodatorum, exactissima Expressione, et Indice Rerum et Verborum copiosissimo; *printed in italics, with numerous fine woodcuts, and folding tables*, 12mo. *hf. calf gilt (nice copy)*; **RARE**, £1. 5s Lutetia, Gul. Cauellat, 1553

Ouvrage qui résume les procédés employés alors pour la construction des astrolabes; une analyse a été donnée dans l'Histoire de l'Astronomie de Delambre. — *Biogr. Gén.*

15096 ——— In **PROCLI DIADOCHI**, Authoris grauissimi SPHERAM MUNDI, omnibus Numeris longè absolutissimum COMMENTARIUS, ante hac nunquam Typis excusus; *with numerous diagrams*, folio, *sewn* (**RARE**), £1. 5s (col.:] *Tubingæ, ex offic. Hulderrichi Morhart*, 1534

15097 **STONE** (Edmund, F.R.S.) ANALISE des INFINIMENT PETITS, comprenant le CALCUL INTEGRAL dans toute son Étendue; avec son Application aux Quadratures, Rectifications, Cubatures, Centres de Gravité, de Percussion, et de toutes Sortes de Courbes, traduit par M. RONDET; *with 4 folding plates: ANALISE des INFINIMENT PETITS, pour l'Intelligence des Lignes Courbes*, par le **Marquis de l'Hospital**, 2<sup>e</sup> Édition; *with 11 folding plates*—2 vols. 4to. in 1, *old hf. calf (back damaged), with long presentation inscription by James Lockhart (well-known amateur mathematician)*, 8s 1735-16

L'Hospital's work was the first published in French on the differential calculus. Stone's was originally published with his English translation of the first work, and was later translated into French as the first work published in that language on the integral calculus.

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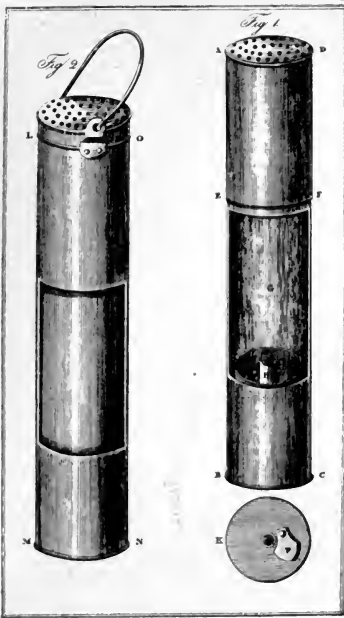


PLATE 2.

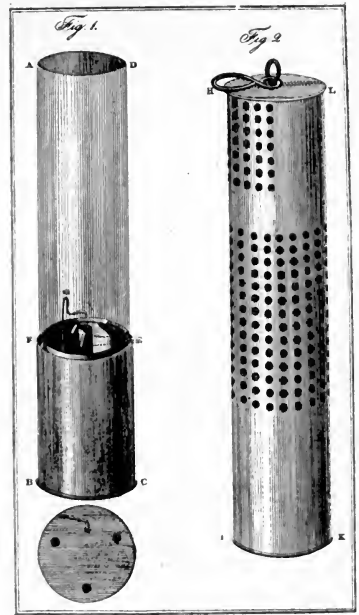


PLATE 3.

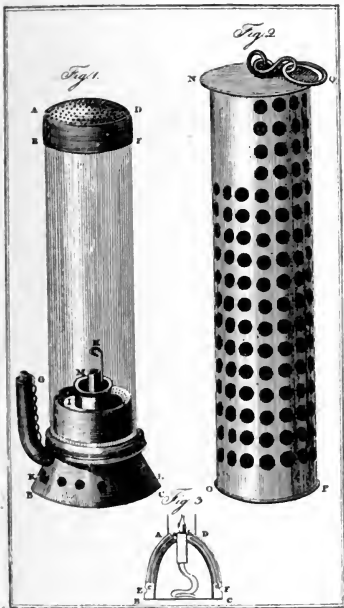
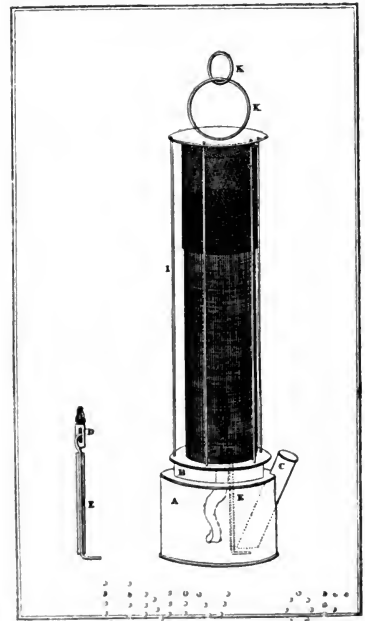


PLATE 4.



No. 15036 (page 754).

George Stephenson's Safety Lamp.

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1	e		05	21	22	3	29	3	1	28	43	3	18	55	
2	A	4 Non	4	22	20	4	12	14	2	3	6	4	1	59	
3	b	3 Non		23	19	4	25	24	3	17	29	4	15	3	
4	c	2 Non	Ambrosij episcopi.	12	24	17	5	8	5	11	52	4	28	7	
5	d	None.		1	25	15	5	21	45	5	6	15	5	11	10
6	e	8 Idus			26	14	6	4	56	6	0	37	5	24	14
7	f	7 Idus		9	27	12	6	18	7	6	25	0	6	7	18
8	g	6 Idus	Martij Egyptiace		28	10	7	1	17	7	19	23	6	20	22
9	A	5 Idus		17	29	8	7	14	38	8	13	46	7	3	26
10	b	4 Idus	Taurus	6	0	6	7	27	38	9	8	9	7	16	30
11	c	3 Idus			1	5	8	10	49	10	2	32	7	29	34
12	d	2 Idus		14	2	3	8	24	0	10	26	55	8	12	38
13	e	Idus		3	3	1	9	7	10	11	21	18	8	25	42
14	f	18 Kal	Martij Tiburtij & valeriani		3	59	9	20	21	0	15	41	9	8	46
15	g	17 Kal	Claui rogationū	11	4	57	10	3	31	1	10	3	9	21	49
16	A	16 Kal			5	54	10	16	42	2	4	26	10	4	53
17	b	15 Kal		19	6	52	10	29	52	2	8	49	10	17	57
18	c	14 Kal		8	7	50	11	13	3	3	23	12	11	1	1
19	d	13 Kal			8	48	11	26	14	4	17	35	11	14	5
20	e	12 Kal			9	46	0	9	24	5	11	58	11	27	9
21	f	11 Kal			10	43	0	22	35	6	6	21	0	10	13
22	g	10 Kal			11	41	1	5	45	7	0	44	0	23	17
23	A	9 Kal	Georgij martiris.		12	39	1	18	56	7	25	7	1	6	21
24	b	8 Kal			13	36	2	2	7	8	19	29	1	9	24
25	c	7 Kal	Marci euangeliste		14	34	2	15	17	9	3	52	2	2	38
26	d	6 Kal			15	32	2	28	28	10	8	15	2	15	32
27	e	5 Kal			6	29	3	11	38	11	2	38	2	28	36
28	f	4 Kal	Vitalis martiris		17	27	3	24	49	11	27	1	3	11	40
29	g	3 Kal	Claui Penthecostes		18	24	4	7	59	0	21	24	3	24	44
30	A	2 Kal			19	22	4	21	10	1	15	47	4	7	48



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According to R. Stuart (*Historical and Descriptive Anecdotes of Steam Engines, Vol. II.*, p. 618), the author, who is not included in the *Biographie Générale*, 'came to England in 1716 to obtain information regarding the mode of mining followed at Newcastle. He remained in the neighbourhood for some years, and was employed as an engineer at a coal-mine; he was a pupil of Desaguliers, and some of his improvements on the diving bell are described in the Doctor's *Experimental Philosophy*. He returned to Sweden in 1726, and erected an atmospheric engine [*supra*], the parts of which he got fabricated in England. He was captain of mechanics, and military architect to the King of Sweden; and was in correspondence with some of his friends in the Royal Society until his death. He invented a mode of warming conservatories by hot water.' According to the *Record of the Royal Society*, he was elected a Fellow in 1731.
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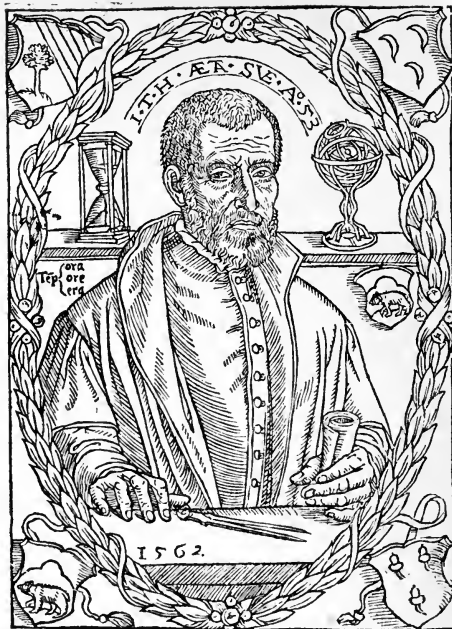
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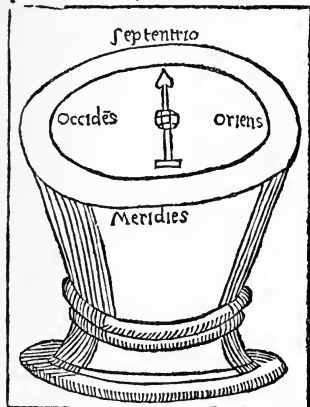
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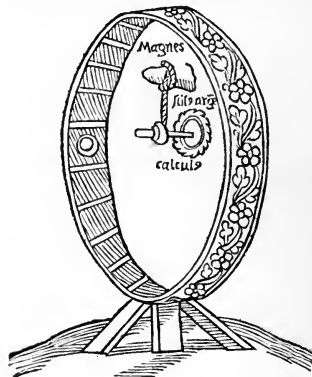


12 **DE MOTV CONTINVO,**  
*res equalis ponderis, dein axem affiges per medium, sus-  
 per quē voluetur rotula, axe omnino immobili manente,*



cui iterum axi stylus adducatur argētens affixus eidem,  
 interque duas casulas collocatus, in cuius summitate Ma-  
 gnes collocetur. In hunc modum preparatus, reducatur  
 primū ad formam rotundam: dein (vt dictum est) Poli ipsi  
 inueniantur: postea in aëlis Poli, duo latera oppsita, in-  
 terque Polos media elimentur, & quasi ad formam oui,  
 lapis

IOANNES TAINSIER HANNO. 14



rot.æ in imam partem sit perpetuus, & casus calculi in op-  
 positam, inter quoslibet duos denticulos receptus, etiam  
 perpetuus erit, qui quidē suo pōdere appetet Centrum ter-  
 ræ, in unūque locum. Quare cum permittet denticulos cir-  
 ca Magnetem quiescere, fiet tandem, vt inilituto satisfa-  
 ctum fuerit. Sint autem loca intermedia denticulorum,  
 tali arte excavata, vt apte cadentem calculum recipiant,  
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 pendiosè narrata de motu continuo.

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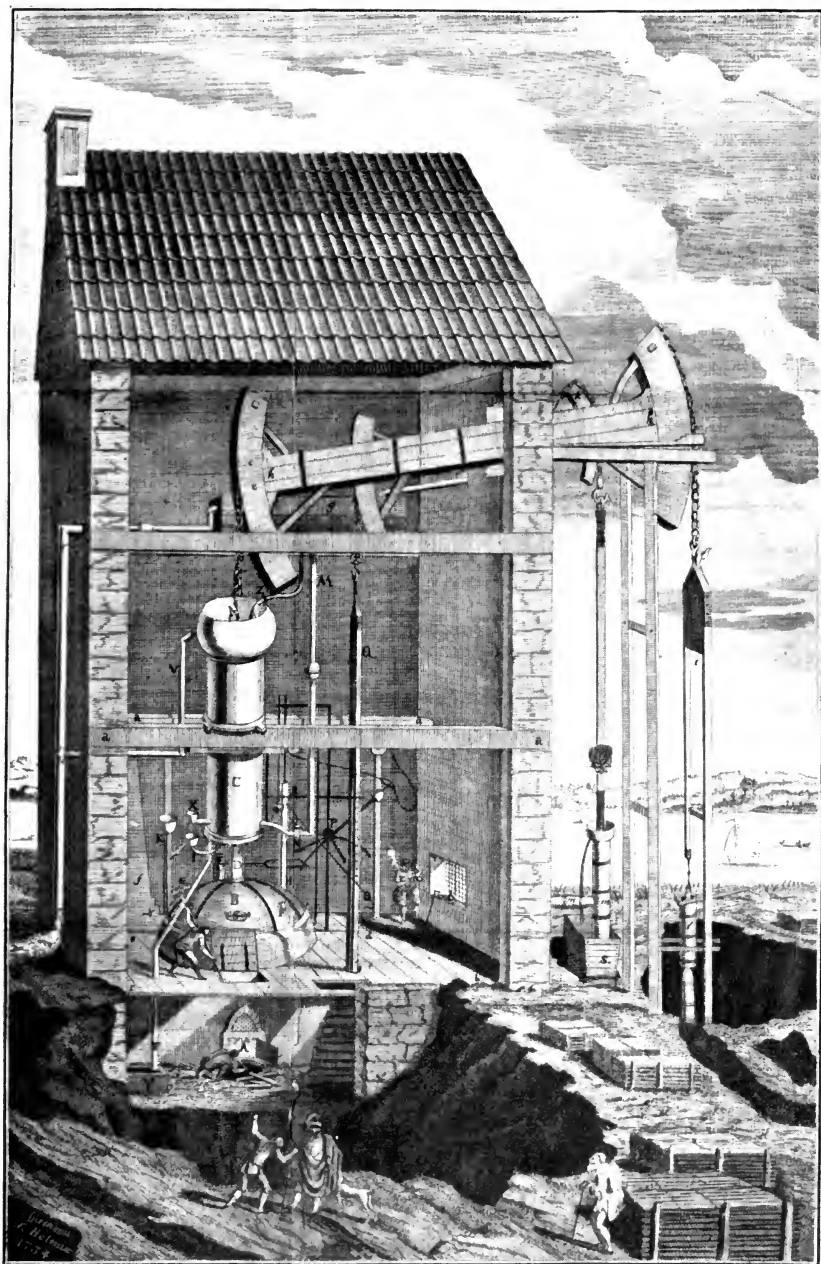


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 Pp. 115-208 contain an account of all the magneto-electric telegraphic systems known at the time, from Lomond's, invented in 1787, to Wheatstone's rotating disc telegraph, invented in 1841, and also include the author's own, the first electro-magnetic printing telegraph invented (in 1837).  
 There was no copy of the above edition in the Ronalds Library. The work was translated into French, German, and Italian.
- 15370 VALLA (Giorgio) CŌMENTATIONES IN PTOLOMEI QUADRIPARTITUM inque CICERONIS Partitiones et Tusculanas Questioēs ac PLINII Naturalis Historie Librum II.; with diagrams, folio, old English calf (6 ll. somewhat defective, title soiled and holed, and corners of 2 ll. torn off, otherwise a tall and clean copy), £1. 1s (col.: Venetis, in officina Simonis Biuilaque, 1502  
 The fourth part is entitled: 'Johannis Petri Vallae in Plinii Praefationis I. Libri Naturalis Historiae Obscuriores Locos Interpretatio,' and treats of astronomical subjects.
- 15371 VALLA [o VALLO] (Lorenzo) LIBRETTO di ABBACO, con il quale ogn' uno potrà imparare con Facilità Grande le sue Operazioni, necessarie per fare qualsivoglia Conto: cioè, Numerare, Sommare, Sottrarre, Moltiplicare, e Partire: con la Prova Reale, e del Sette, ed altri belli Avvertimenti, e Regole Curiose; with Austrian arms on title, 12mo. (pp. 24), boards (a few corners defective, but a sound copy); rare, £1. 10s Messina, Pietro Brea, 1611  
 A very rare work of which Riccardi, who mentions the work in *Biblioteca Matematica Italiana*, Supp. V., was only able to quote the above copy. It is not mentioned by other bibliographers, e.g. Prof. de Morgan and Poggendorff, nor was there a copy in the Libri Library.
- 15372 VALLIER (Emmanuel, chef d'escadron d'artillerie) L'ARTILLERIE: Matériel, Organisation: France, Allemagne, Angleterre, Autriche-Hongrie, Italie, Espagne, Russie, Turquie, Etats-Unis, Japon, etc.; with 45 illustrations, 8vo. *cl.*, 2s (p. F. 5 nett) 1899
- 15373 VALTURIO (Roberto): OPERA de FACTI e PRECEPTI MILITARI di lo eccellente Misier ROBERTO VALTURIO Ariminese gia inscripta in Latin a lo illustre Signor SIGISMON DO PANDOLPHO MALATESTA Principe di Arimino et hora traducta in Vulgar [per PAULO RAMUSIO] a Nome et Gloria del magnanimo Capitanno e sempre felice in le Bataglie Signor Roberto di Aragonia di San Severino General Loco Tenente del serenissimo et iustissimo Senato Venetiano; with 96 fine woodcuts after designs by MATTEO PASTI, and the first initial finely painted, thick folio, old vellum (top corners water-stained and a few slightly worn away, otherwise a sound copy); very rare; cheap, £30.  
*Impressa cū industria di Bonin di Boninis da Ragusi z . . Verona correndo l'anno del Mille e quatrocento. LXXXIII. adi XVII. de februaryo [1483]*  
 The first Italian edition, and one of the earliest works published in the vulgar tongue.  
 'Edition recherchée à cause des figures et parce qu'elle est la première de cette traduction italienne.'—Brunet.  
 A copy of the above edition fetched £88. at auction last year. The above has a 4-p. MS. index added at end.
- 15374 ——— De RE MILITARI Libri XII multò emaculatus, ac Picturis, quæ plurimæ in eo sunt, elegantioribus expressum, quàm cum Verone inter Initia Artis Chalcographicæ Anno M.CCCC.LXXXIII inulgaretur; with 96 large and fine woodcuts after MATTEO PASTI (re-engraved), folio, old *hf. Italian vellum* (a few corners slightly waterstained, otherwise a FINE AND UNCUT COPY); rare, £6. 6s Parisiis, Christianus Wechelus, 1532  
 The third edition of this celebrated work, and the first one printed in Paris. It was reprinted in 1534 and 1555.  
 'Cet ouvrage témoigne de la connaissance approfondie que Valturio avait des auteurs de l'antiquité; il décrit avec une grande clarté leurs machines de guerre, et en donne en même temps le dessin.'—*Biogr. Gén.*  
 The woodcuts of this celebrated work are very remarkable in themselves, and as illustrating every variety of mechanical military engines, as well as of cannon.
- 15375 VAN HISE (Charles Richard; Pres. Univ. Wisconsin) TREATISE ON METAMORPHISM, with 13 plates (one coloured), and numerous other illustrations, thick 4to. (pp. 1266), *cl.*, 12s 6d U.S. Geol. Survey, Washington, 1904  
 'Attempting to reduce the phenomena of metamorphism to order under the principles of physics and chemistry, or, more simply, under the laws of energy.'
- 15376 VAREN [latine VARENUS] (Bernhard, M.D.) GEOGRAPHIA GENERALIS, in qua Affectiones Generales Telluris explicantur, Editio nova, summâ Curâ quam plurimis in Locis emendata, et XXXIII Schematibus Novis, etc. etc. aucta et illustrata ab ISAACO NEWTON; Ed. II. auctior et emendatior; with plates, sm. 8vo. *fine copy in contemporary calf*, 8s 6d Cantabrigiæ, 1681  
 'Ouvrage fort savant qui opéra une révolution complète dans la science de la géographie.'—*Biogr. Gén.*  
 'Ouvrage célèbre et considérable, où l'astronomie occupe une large place.'—*Houzeau et Lancaster.*
- 15377 VATTIER (Charles) L'AVENIR de la MÉTALLURGIE du FER au CHILI, avec le 1<sup>ER</sup> SUPPLÉMENT; with plate, and 3 folding maps, 2 vols. impl 8vo. *sewn*, 3s 1890

- 15378 **VAUQUELIN** (Louis Nicholas, *de l'Institut*; F.R.S.) MANUEL de l'ESSAYEUR, 8vo. (pp. 96), *sewn (rare), with MS. corrections (see below)*, 9s  
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- 15379 **VEGETIUS** Renatus (Flavius) De RE MILITARI Libri IV, post omnes omnium Editiones Ope veterum Librorum correcti a GOD. STEWECHEIO; accesserunt Sexti Julii Frontini STRATEGEMATA, in eadem F. MODII Notæ et G. STEWECHEII Conjectanea. **Aeliani** de INSTRUENDIS ACIEBUS. **Modesti** de VOCABULIS REI MILITARIS, accessit GOD. STEWECHEII Commentarius; *with fine portrait of Stewecchius* et. 32 *by Hioltzris, and numerous good woodcuts of military engines*, 2 vols. sm. 4to. in 1, *fine copy in old limp vellum, with bookplate of John Lord Sheffield (friend of Gibbon)*, £1. 5s *Antwerp, Christ. Plantinus, 1585*
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- 15384 **VENTUROLI** (Giuseppe, *Univ. Bologna*) ELEMENTI di MECCANICA e d'IDRAULICA, 3<sup>a</sup> Edizione, ampliata dall' Autore; *with 14 plates*, 2 vols. 8vo. *hf. morocco gilt (nice copy)*, 6s 6d  
*Milano, 1817-18*  
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*Venetii [c. 1595]*
- An extremely rare and interesting work of which three varieties are known: two having the descriptions only in Latin and Italian, one issue of which has only 40 plates, and the third as above with the descriptions also in Spanish, French, German, and 19 plates. This issue is the rarest of all. Some of the plates are of great importance, e. g. plate 38 'Homo volans', giving a perfect representation of a parachute, plates 34-36 suspension bridges, of which no. 34 is the earliest description of one wholly of iron, 49 a diving belt, 41 a digging machine, 43 a rope-making machine, 40 a boat with paddle wheels going up a river, and a great variety of wind, water, and mechanically-driven mills, oil presses, etc. Plate 4 represents 'Ecclesia Sibenici'.
- The author, a native of Sebenico, Dalmatia, was Bishop of Partibus of Canadium, in Hungary, and in his later years appears to have lived in Venice. There is a full description of the work in M. Libri's *Histoire des Sciences Mathématiques*, where it is termed 'un ouvrage très rare qui ne se trouve guère indiqué par les bibliographes.'
- At the end of the descriptions is a List of Machines of the author's own invention, 'fra le quali veramente alcune sono interessantissime' (Riccardi).
- No copy of this work can be traced as having been sold at auction within the last 30 years.
- 15388 **VERNEUIL** (Philippe Édouard Poulletier de; *de l'Institut*; F.R.S.), et Édouard COLLOMB: CARTE GÉOLOGIQUE de l'ESPAGNE et du PORTUGAL, 2<sup>e</sup> Edition (26 × 35 inches), *finely coloured; mounted on linen and folded, in cl. case*, 4s  
*[c. 1865]*
- 15389 **VIERI** [detto il VERINO II] (Francesco di Giovambattista de', *da Firenze*) TRATTATO nel quale si contengono i Tre Primi Libri delle METHEORE, nuovamente ristampati, e da Lui ricorretti con l'Aggiunta del Quarto Libro, 12mo. *fine copy in old vellum (rare)*, 15s  
*Firenze, G. Marsiccotti, 1582*
- Second and last edition of this early treatise on meteorology, and the only one containing the fourth book. Besides meteorological subjects, it treats of comets, the tides, and the rainbow. Book IV (pp. 187-424) treats of Aristotelian meteorology and physics.
- The author is not noticed by Poggenдорff.
- 15390 **VIÈTE** [latine VIETA] (François) OPERA MATHEMATICA, Operâ atque Studio FRANCISCI À SCHOOTEN; *with numerous diagrams (a few with moveable slips), folio, boards, uncut (RARE)*.  
 £1. 17s 6d *Lugd. Batav., B. et A. ELZEVIR, 1646*
- 'Belle édition'.—*Brunet.*
- In his most important work, *In Artem*, 'the earliest work on symbolic algebra, explaining how algebra could be applied to the solution of geometrical problems', he 'introduced the use of letters for both known and unknown (positive) quantities, a notation for the powers of quantities, and enforced the advantage of working with homogeneous equations . . . One of his improvements was that he denoted the known quantities by the consonants B, C, D, etc., and the unknown quantities by the vowels A, E, I, etc., the other was to introduce new symbols to represent the square, cube, etc. of quantities which had already occurred in the equations . . . These two improvements were almost essential in any further progress in algebra. . . . Vieta's works on geometry are good. He applied algebra and trigonometry to help him in investigating the properties of figures', etc. etc. etc.—*W. W. R. Bull.*
- 'The greatest mathematician of the Sixteenth Century'.—*Thomas Fowler, jr., President of Corpus.*
- 15391 ———: PRINCIPES de COSMOGRAPHIE: tirez d'un Manuscrit de Viète, et traduits en François; *with astronomical diagram*, 13mo. *old vellum (rare)*, 10s 6d  
*A. Courbé, 1637*
- 15392 ——— ZETETICORUM Libri V; *with diagrams, folio, limp vellum wrapper (RARE)*, 15s  
*s. l. a. aut t. n.*

This work, which treats of the solution of equations, was originally published as an appendix to Vieta's *In Artem Analyticam Isagoge*. The above edition, which is quite different from that of 1593, has no title, and is numbered from 1 to 24, with the signatures A—M in twos, and appears to be unknown to bibliographers.

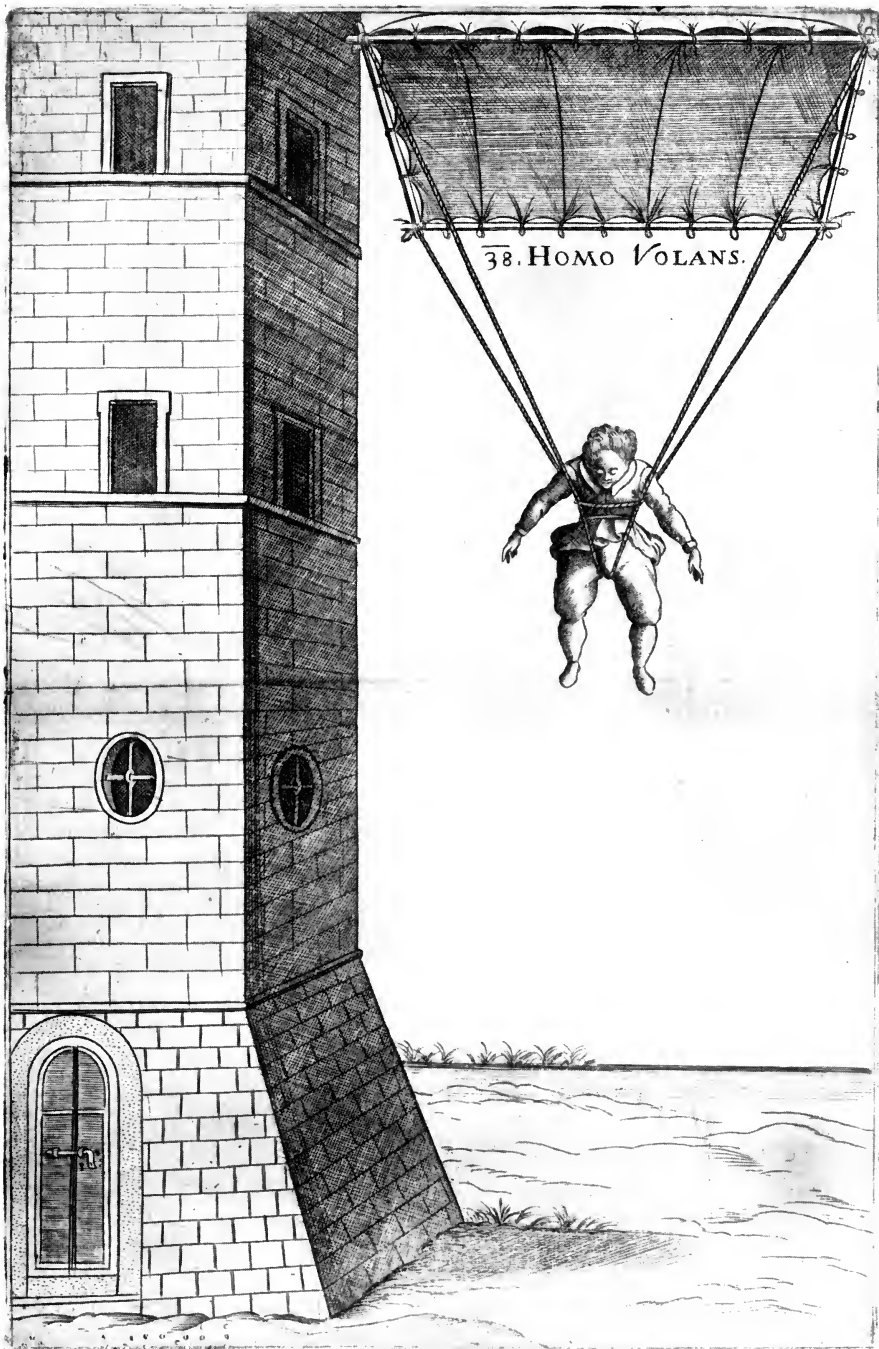
- 15394 **VIÈTE** [*latine VIETA*] (François) OPUS RESTITUTÆ MATHematicæ ANALYSEOS, seu ALGEBRA NOVA [in Artem Analyticam Isagoge. Zeteticorum Libri V. Effectuum Geometricarum Canonis Rencensio. Supplementum Geometricæ (*imperfect ad end*)] ; with *diagrams* : VARIORUM de REBUS MATHematicis RESPONSORUM Liber VIII., cuius præcipua Capita sunt, de Duplicatione Cubi ; et Quadratione Circuli ; quæ claudit Πρόλογον, seu Ad Usum Mathematici Canonis Methodica ; with *woodcut vignette on title, and numerous diagrams*—2 vols. folio in 1, *old limp vellum* (VERY RARE), £2. 10s  
Turonis, I. Mettayer, 1591-3  
All the above are original editions and of great rarity, having been privately printed for distribution among the author's friends only. They include his most important work, *In Artem Analyticam Isagoge*.
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'Il y a beaucoup d'érudition cabalistique.'—*Biogr. Gén.*
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This work contains the first description of crystallised benzoic acid. 'On y trouve une recette pour faire de l'or.'—*Biogr. Gén.* It was translated into English in 1649, and into Latin in 1613 (for *Theatrum Chemicum*).
- 15397 **VILLE** (Georges) On ARTIFICIAL MANURES, their Chemical Selection and Scientific Application to Agriculture, translated and edited by SIR WILLIAM CROOKES, P.R.S., with 5 *folding plates* (*one coloured*), and *woodcuts*, 8vo. cl., 4s (p. £1. 1s) 1879
- 15398 ——— NEW EDITION, revised by SIR WILLIAM CROOKES, P.R.S., and JOHN PERCIVAL, with 5 *folding plates* (*one coloured*), and *woodcuts*, 8vo. cl., 7s (p. 10s 6d nett) 1909  
The author first demonstrated that wheat would grow in calcined sand to which salts of ammonia only were added.
- 15399 **VIMERCATO** (Giovanni Battista, Monaco di Certosa) DIALOGO [della Descriptione Teorica et Pratica] de gli HOROLOGI SOLARI : nel quale con Ragioni speculative, et pratiche facilmente s'insegna il MODO di FABRICAR tutte le Sorti di HOROLOGI, nuovamente ristampato, con Postille in Margine, ed un Aggiunta di un Horologio da servir sene al Lume della LUNA, ò à i Raggi di essa per saper qual Hora sii della Notte ; with 3 *folding plates*, and *numerous large woodcuts*, sm. 4to. *contemporary vellum* (*sound copy*) ; RARE, £1. 10s Padova, 1672  
Last edition of this popular work on dialling. All editions of this work, which was unknown to Lalande, Poggendorf, and Brunet, are now VERY RARE. 'Buon trattatello di gnomonica.'—*Riccardi*.
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- 15401 **VIOLLE** (Louis Jules Gabriel, de l'Institut) COURS de PHYSIQUE, TOME I : PHYSIQUE MOLÉCULAIRE ; with 566 *woodcuts*, large 8vo. (pp. 1021), hf. *morocco gilt* (*nice copy*), 15s (p. F. 28 nett sewn) 1884
- 15402 ——— ANOTHER COPY, 2 vols. hf. *calf neat*, 14s 1883-4
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The vineyards got entirely eradicated because post-Reformation stomachs were weaker than their Medieval forebears. But that wine can be grown in England was shown by the late Marquess of Bute in Glamorganshire, where the vineyard is still kept up. Whether Lord Bute's guests at Castell Coch liked the brand any more than they did William Burges's grand oaken settles is not recorded.
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Vitello's work contains not only a summary of all that was known on optics to the ancients and to Alhazen, but also a number of original investigations.  
'A work on optics less diffuse and more systematic than that of Al Hazen, on which it was based. Witelo explained the twinkling of stars as due to the motion of the air, and showed that the effect was intensified if the star was viewed through water in motion. He pointed out that the rainbow was not formed by reflexion alone, as was taught by Aristotle, but was due to both reflexion and refraction.'—*Prof. Cajori*.  
The existence of a separate edition of his works was unknown to Poggendorf and Heller, who only quote the edition published with Alhazen's works in 1572.  
The second piece is the first complete edition of Euclid's works. The above copy contains the three preliminary ll., with an address by Philip Melancthon, which were abstracted in nearly all cases by the clerical censor—an interesting instance of the rigidity of Ecclesiastical censure at the period of the Reformation.
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(p. M. 12 sewn) *ibidem, 1901*
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- 15418 **VOSSIUS (Isaac; Canon of Windsor)** VARIARUM OBSERVATIONUM Liber; *with woodcuts, 4to. old white vellum, or, old calf, 12s 6d* Londini, Robertus Scott, 1685  
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The dissertation on the construction of triremes was inserted by Grævius in his *Thesaurus Antiquitatum Romanorum*, and is referred to with commendation in Smith of Jordanhill's 'Dissertation on the Navigation of the Ancients.'
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*Upsala, 1866*
- 15421 **WACKERBARTH (A. D.)** PROVISIONAL THEORY of LEDA, 4to. (pp. 24), *sewn, with author's inscr., 2s 6d*
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The planetoid Leda was discovered by Chacornac in 1856.
- 15423 **WAEYWEL (Daniel)** DEMONSTRATIE wegens de QUADRATURA CIRCULI ontdeekt en uytgevonden; *with folding plate, sm. 4to. (pp. 28), boards (headlines cut into); rare, 15s* Amsterdam, 1712  
The author finds  $3\sqrt{12}$  as value for  $\pi$ . Holland was the great country of circle-squarers during the XVIII. Century, probably owing to the fact that a money prize was offered there for a 'correct' solution.
- 15424 **WAGNER (Joseph Friedrich)** NOTIZEN über die MINERALIEN-SAMMLUNG von ALEXANDER V. CRICHTON; *with fine portrait of Gotthelf Fischer, and 18 plates, 4to. (pp. 147), sewn, 4s 6d* Moskwa, 1818  
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An elementary work which seems to have sufficed for the needs of a university education in the latter end of the Seventeenth Century.  
The author was Master of University College, Oxford, and went over to Rome on James II.'s accession, who charged him with the uphill task of Romanising the University. Walker only succeeded however in getting 'the curses of all both great and small' (*Anthony à Wood*), a sentiment also expressed in some contemporary doggerel, which was sung by the undergraduates:  

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Sing Ave Maria
But so will not I a
for why a
I had rather be a fool than a knave a.'
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An important work in which the author bases the principles of agriculture on a comparative study of the chemical constitution of plants and the soil.

Bishop Watson bought this book to improve his estate in Westmorland, where he lived while Bishop of Llandaff, and took to planting, and what Wordsworth called a vegetable manufactory, while his sons 'merrily pursued cockfighting', and the natural result ensued 98 years *post mortem* in the disendowment of the Church in Wales.

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The author was Bergmann's predecessor as professor of chemistry at Upsala. He promoted the study of mineralogy by giving a more systematic arrangement of minerals.

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- 15565 [—] ANOTHER COPY, *wanting the portrait; old sheep (back damaged; also somewhat browned or water-stained)*, 15s  
'A very ingenious work on cryptography and modes of rapid correspondence.'—*D. N. B.* It contains a chapter 'concerning a language that may consist only of tunes and musical notes, without any articulate sound', and another 'concerning an universal character, that may be legible to all nations and languages'. The work includes much historical information on its subject.
- 15566 **WILKINSON** (Abraham, F.S.A. Scot.) TENTAMEN PHILOSOPHICO-MEDICUM de ELECTRICITATE, 8vo. (pp. 61), *sewn*, 4s 6d *Edinburgi, 1783*  
There is no copy of this work in the Ronalds Library.
- 15567 **WILLIS** (John) EASY METHOD OF CONSTRUCTING the various Types of MAGIC SQUARES and MAGIC CUBES, with Symmetric Designs founded thereon, *with coloured illustrations and folding table*, cr. 4to. *cl.*, 8s *Bradford, 1909*
- 15568 **WINTERSTEIN** (Ernst, Zürich) und **George TRIER**: Die ALKALOIDE: eine Monographie der natürlichen Basen, roy. 8vo. *sewn*, 7s (p. M. 11) *Berlin, 1910*

- 15570 **WILSON** (Benjamin; F.R.S., *portrait painter*) ESSAY towards an EXPLICATION of the PHENOMENA of ELECTRICITY, deduced from the Æther of Sir Isaac Newton, *with folding copper-plate of electrical machine, etc.*, 8vo. (pp. 110), *sewn*, 7s 6d 1746
- 15571 ——— ANOTHER COPY, *wanting the plate: sewn*, 4s  
Advancing a theory that 'the electric matter is in all bodies, in reciprocal proportion to their densities, luminous, sulphureous, and unctuous bodies only excepted, that it issues from all bodies, electrified or not electrified', and attempting an explanation of the cause of gravitation.
- 15572 ——— SERIES of EXPERIMENTS relating to PHOSPHORI and the Prismatic Colours they are found to exhibit in the Dark; with Translation of TWO MEMOIRS on the same, from the Bologna Acts, by J. B. BECCARI [*sic*], 4to. *boards, uncut*, 9s 1775  
'This work was communicated to several foreign learned bodies, and was the subject of a memoir by Leonhard Euler, read at the Academia Scientiarum Imperialis at St. Petersburg, and of a Letter from G. B. Beccaria'.—D. N. B.
- 15573 ——— SHORT VIEW of ELECTRICITY, *with plate, woodcuts, and diagrams*, 4to. (pp. 37), *sewn*, 6s 1780
- 15574 ———: SUNDRY PAPERS relative to an ACCIDENT from LIGHTNING at PURFLEET, *with 4 folding plates by Basire, including one of the Great Cylinder in the Pantheon, and etched portrait of Wilson by himself (inserted)*, 4to. (pp. 81), *sewn (rare)*, 12s 6d [1777]  
Including 'New Experiments and Observations [made at the Pantheon] on the Nature and Use of Conductors,' by B. WILSON (pp. 69).  
'He had a long controvery with Benjamin Franklin on the question whether lightning-conductors should be round or pointed at the top [asserting that pointed conductors attracted the lightning], and was supported in his views by George III., who declared his experiments were sufficient to convince the apple-women in Covent Garden.'—D. N. B. The above was the author's last effort in the advocacy of ball-shaped conductors, which in the above case gained strength from the fact that the Purfleet Powder Magazine, which was provided with pointed conductors, was struck by the lightning.
- 15575 ——— TREATISE on ELECTRICITY, 2nd Edition, *with fine etched portrait by the ARTIST HIMSELF, and 5 copperplates, 8vo. old calf (rare)*, 15s 1752  
The author was the first to use a conductor with the collector of his cylinder electrical machine. He also found that the electric property of tourmaline was shared by other crystals. He received the Royal Society's gold medal in 1760 for his electrical experiments.
- 15576 **WILSON** (Eugene Benjamin) The CHLORINATION PROCESS, *with 8 illustrations*, cr. 8vo. *cl.*, 3s 6d (p. 6s 6d nett) *New York, 1901*  
Chlorine is used in the civilised world to extract gold from the ore and to bleach fabrics: in Germany to torture men to satisfy the hate of Eucken and Harnack.
- 15577 **WILSON** (George, *Chymist*) COMPLETE COURSE of CHYMISTRY, containing near Three Hundred Operations, several of which have not been Publish'd before; also the Structure of several Furnaces, with near 300 Characters, which are dispers'd in Chymical Authors, and such Instruments and Vessels as are necessary in a Compleat Elaboratory, *first edition, with 8 plates of chemical characters and apparatus*, 8vo. *old calf (sound copy)*; RARE, 16s 6d *W. Turner, 1699*
- 15578 ——— THIRD EDITION, very much enlarged, with the Author's Experiments upon Metals, *with portrait et. 78 by v. d. Gucht, and 8 copperplates of chemical characters and apparatus*, 8vo. *old panelled calf (partly water-stained)*; *rare*, 10s 6d 1709  
The last 29 pp. contain experiments on the transmutation of metals, which are not included in the foregoing editions.
- 15579 **WILSON** (Giffin; F.R.S.) ESSAY on the RESOLUTION of ALGEBRAIC EQUATIONS: attempting to distinguish particularly, the Real Principle of every Method, and the True Causes of the Limitations to which it is subject, 4to. (pp. 40), *sewn*, 2s 6d [1799]
- 15580 **WILSON** (Henry, *late Mathematician to H.M.'s Navy*) The DESCRIPTION and USE of that most Excellent Invention, call'd the GLOBULAR CHART: shewing its Agreeableness to the Globe, and the natural and easy Consequences thereof in the Practice of Navigation, with a Specimen of a Sea-Chart in that Projection, and Trigonometrical Calculation to prove the Truth thereof . . . also an Answer to Mr. Haselden's Letter to Dr. Halley, proving by Mathematical Demonstration, that his Principal Argument is false by above Three in Five, the rest invalid, and the whole incoherent, and Appendix, containing an Answer to Mr. Collier, and proving that these two Authors contradict themselves, and one another, *with plate and folding map*, 4to. (pp. 44), *sewn (rare)*, 12s 6d *J. Senex and T. Taylor, 1722*  
This was published in connexion with the proposal to Parliament of John Senex, F.R.S., for the publication of a complete Sea Atlas on the globular projection
- 15581 ——— SURVEYING IMPROVED: or the Whole Art, both in Theory and Practice, fully demonstrated; 4th Edition, with Additions; also GEODESIA ACCURATA: or Surveying made Easy by the Chain only, with a new Essay on Solids, by WILLIAM HUME, *with numerous plates and diagrams*, 8vo. *contemporary calf (fine copy)*, 7s 6d 1755
- 15582 **WILSON** (Herbert Michael; *U.S. Bureau of Mines*) IRRIGATION ENGINEERING, 5th Edition, *with 41 plates and 148 other illustrations*, large cr. 8vo. *cl. (cover stained)*, 8s (p. 17s nett) *New York, 1906*
- 15583 ——— TOPOGRAPHIC SURVEYING, including Geographic, Exploratory, and Military Mapping, with Hints on Camping, Emergency Surgery, and Photography, *with 4 plates and 205 other illustrations*, 8vo. *cl. (cover damaged)*, 6s 6d (p. 15s nett) *ibidem, 1902*
- 15584 **WINCHILSEA** (Heneage Finch, 2nd Earl of): A TRUE and EXACT RELATION of the late PRODIGIOUS EARTHQUAKE and ERUPTION of MOUNT ÆTNA, or Monte-Gibello; as it came in a Letter written to His Majesty from Naples by the Right Hon. the EARLE of WINCHILSEA, His Majesty's late Ambassador at Constantinople, who in his Return from thence, visiting Catania in the Island of Sicily, was an EY-WITNESS of that DREADFUL SPECTACLE. Together with a more particular Narrative of the same, as it is collected out of severall Relations sent from Catania, *with folding copperplate, and another contemporary view on copper of the Eruption (added)*, sm. 4to. (pp. 38), *hf. roan (VERY RARE)*, £1. 5s *T. Newcomb in the Savoy, 1669*  
The last 2 pp. contain 'a List of the most considerable Towns and Places Ruin'd and destroyed by the Dreadful Earthquake and Eruptions.'

15586 **WING (Vincent)** EPHEMERIDES of the CELESTIAL MOTIONS for XIII Years, 1659-1671, diligently calculated according to the Doctrine of Astronomia Instaurata, and applied to the Horizon of the most famous CITY of LONDON, with a brief Introduction [pp. 156] for the Use thereof, *with woodcuts and diagrams*, sm. 4to. FINE COPY in contemporary calf, with bookplate of Lord Arundell of Wardour, and auto. of [HENRY 3RD] LORD ARUNDELL [of WARDOUR] on title (RARE), £1. 15s  
R. and W. Leybourn, 1658

\*Wing issued ephemerides, the 'exactest' then to be had, according to John Flamsteed, who maintained 'a fair correspondence' with him.—D. N. B. They include astrological meteorology.

15587 ———: GEODETES PRACTICUS REDIVIVUS: the ART of SURVEYING, formerly publish'd by VINCENT WING, now much augmented and improv'd; with APPENDIX, shewing the whole Art of Surveying by a New Instrument, called the EMPERIAL TABLE, performing the Work of the Theodolite, Circumferentor, Semi-Circle, Chard and Needle; with the Description and Use of a NEW QUADRANT, with Supplement, SCIENTIA STELLARUM, containing new and accurate Tables of the Planetary Motions, etc. etc., by JOHN WING, *with copperplates, and numerous diagrams, folio, old panelled calf, newly and neatly rebaked* (RARE), £1. 7s 6d 1700

The 'Emperial Table' was the editor's own invention, and consisted of 'a perfect plain table, an exact theodolite and circumferentor, and the peractor exactly adjusted, the needle or declinatory also fully completed thereon, in its own kind and order, which instruments are here fully completed upon this one instrument, without the least confusion of lines or parts.'

One of Vincent Wing's best known publications was the *Olympia Domata*, a semi-astrological almanack, continued for over a hundred years by the Stationers' Company.

15588 ——— HARMONICON CŒLESTE: or, the Cœlestial Harmony of the Visible World: containing, an absolute and entire Piece of Astronomie, wherein is succinctly handled the TRIGONOMETRICALL PART, generally propounded, and particularly applied to the Diurnall Motion . . . the Second Motions of the Luminaries and the other Planets, with their Eclipses, etc., grounded on the most Rationall Hypothesis yet constituted, and compared with the best Observations, especially those of TYCHO BRAHE, and other more modern Observators, fitted to the Meridian of London, *with numerous diagrams, folio, boards (stained and last l. mounted)*, 8s 6d R. Leybourn, 1651

15589 **WINGATE (Edmund)** ARITHMETIQUE MADE EASIE, the SECOND BOOK: containing a perfect Method for the true Knowledge, and Practice of ARTIFICIAL ARITHMETIQUE performed by LOGARITHMS: and resolving all Arithmetick Questions by Addition and Subtraction. Together with the Construction and use of an Instrument called the LINE of PROPORTION, exhibiting the Logarithm of any Number under 100000, with Appendix, resolving likewise by Addition and Subtraction all Questions, that concern Equation of Time, Interest of Money, and Valuation of Purchases, Leases, Annuities, and the like; 2nd Edition, much enlarged by the Author himselfe, *with 10 copperplates, 24mo. hf. calf neat (title very slightly soiled, and some ll. waterstained, but a REMARKABLY SOUND COPY); very rare*, £1. 10s R. and W. Leybourn, 1652

Wingate's Arithmetic was originally published, in two parts, in 1630. The first part appeared in 1650, revised by JOHN KERSEY the elder, as 'Arithmetique made easie.' The above second part was reprinted for the first and last time in 1652.

15590 ——— ARITHMETICK, containing a plain and familiar Method for attaining the Knowledge and Practice of Common Arithmetick; 4th Edition, with Appendix, containing choice Knowledge in Arithmetick, both Practical and Theoretical (pp. 243), by JOHN KERSEY [the Elder], 12mo. hf. bound (title wanting); RARE, 10s 6d [1668]

Both the above editions were unknown to Professor de Morgan. The earliest edition described by him is that of 1673. This edition was also unknown to D. N. B.

15591 ——— TWELFTH EDITION, with a New SUPPLEMENT, of Easie Contraction in the necessary Parts of Arithmetick, useful Tables of Interest and Flemish Exchanges, also a Practical Mensuration, by GEORGE SHELLEY, sm. 8vo. contemporary calf, 6s 1708

15592 ——— THIRTEENTH EDITION, with a new Supplement, by GEORGE SHELLEY, sm. 8vo. contemporary panelled calf (sound copy), 6s 1713

15593 ——— EIGHTEENTH EDITION, with the Additions and Emendations by JOHN KERSEY and GEORGE SHELLEY, and all the Improvements that have appeared in other Writers since their Time; also sundry others, that are entirely new, by JAMES DODSON, *with frontispiece*, 8vo. old calf, 7s 6d 1751

The first edition published by James Dodson, and the best of the work, but according to Professor de Morgan, with very little Wingate in it. D. N. B. mistakenly gives the date as 1753.

15594 ——— NINETEENTH EDITION [unchanged], *with frontispiece*, 8vo. cl., 5s 1760

15595 ——— ANOTHER COPY, old calf, 6s

The last edition published.

15596 ——— ΛΟΓΑΡΙΘΜΟΤΕΧΝΙΑ, or the CONSTRUCTION and USE of the LOGARITHMETICALL TABLES, by the Helpe whereof, Multiplication is performed by Addition, Division by Subtraction, the Extraction of the Square Root by Bipartition, and the Cube Root by Tripartition, etc.; finally, the Golden Rule, and the Resolution of Triangles as well right lined as sphericall by Addition and Subtraction, first published in the French Tongue, and after translated by the same Author; 3rd Edition, enlarged by the Author himself, 24mo. contemporary sheep (sound and clean copy); RARE, £1. 1s Miles Flesher, 1648

First published at Paris, 1626, in French. The tables of logarithms are compiled from HENRY BRIGGS'S.

15597 ——— THE USE of the RULE of PROPORTION, in Arithmetique and Geometrie, first published in the French Tongue, and now translated by the same Author; whereinto is now also inserted the Construction of the same Rule, and a further Use thereof, in Questions that concern Astronomie, Dialling, Geographie, Navigation, Gaging of Vessels, Military Orders, Interest, and Annuities, *with large folding plate of Gunter's Scale*, 32mo. contemporary sheep (RARE), £1. 1s

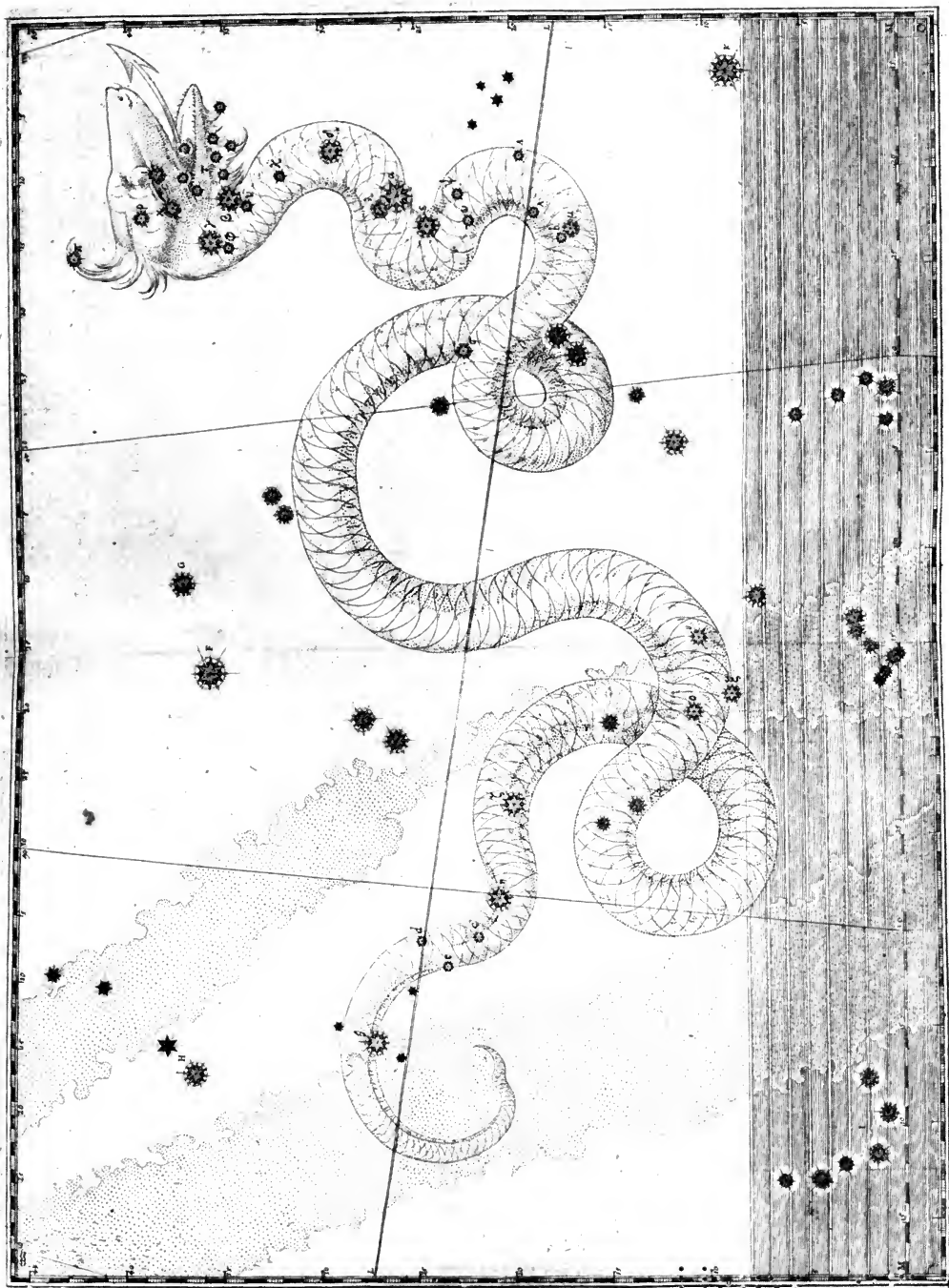
M. F. for P. Stephens, 1645

An account of Gunter's logarithmic scale, which was first published (in French) at Paris in 1624.

- 15599 **WINKLER (Johann Heinrich; Univ. Leipzig)** ELEMENTS of NATURAL PHILOSOPHY Delineated, translated from the 2nd German Edition, as enlarged by the Author, with 14 plates, 2 vols. 8vo. *tree-calf, newly rebound (scarce)*, 12s 6d 1757
- 15600 — Die EIGENSCHAFTEN der ELECTRISCHEN MATERIE und des ELECTRISCHEN FEUERS, aus verschiedenen neuen Versuchen erklärt, und nebst etlichen NEUEN MASCHINEN zum ELECTRISIREN; with 4 plates, sm. 8vo. *sewn (RARE)*, 17s 6d Leipzig, 1745  
This work contains a description of the author's electrical machines, in which for the first time a leathern cushion is used, which is pressed against the glass globes by a spring.
- 15601 — GEDANKEN von den EIGENSCHAFTEN, WIRKUNGEN und URSACHEN von der ELECTRICITÄT, nebst einer Beschreibung ZWO NEUER ELECTRISCHEN MASCHINEN; with 3 plates, sm. 8vo. *sewn, or, boards (rare)*, 12s *ibidem*, 1744  
Containing experiments in which the author first showed that the electric spark ignites alcohol, etc.
- ESSAI sur la NATURE, les EFFETS, et les CAUSES de l'ELECTRICITÉ (1748)—v. No. 12736 *ante*.
- 15602 — Die STÄRKE der ELECTRISCHEN KRAFT des WASSERS in gläsernen Gefässen, welche durch den Musschenbrötkischen [*sic*] Versuch bekannt geworden; with 2 plates, 8vo. *sewn (rare)*, 15s *ib.*, 1746
- 15603 — ANOTHER COPY, *wanting the plates; sewn, 6s*  
Including his experiments with three powerful Leyden jars, when he obtained sparks that could be seen at a distance of 200 yards in broad daylight. From their discharge he inferred that the phenomena of lightning and thunder must be the result of an electric discharge on a large scale. Winkler was also the first to mention that the earth was a good conductor of electricity.  
There was no copy of any of the above three works, the only important ones written by the author on electricity, in the Ronalds Library.
- 15604 **WISLICENUS (Johannes; Univ. Leipzig)** Über die RÄUMLICHE ANORDNUNG der ATOME in ORGANISCHEN MOLEKULEN und ihre Bestimmung in geometrisch-isomeren ungesättigten Verbindungen, 2. mit Nachträgen versehener Abdruck; with 186 diagrams, impl. 8vo. *sewn, 2s 6d (p. M. 4)* Leipzig, 1889  
One of the classic contributions to stereo-chemistry.  
\*Wislicenus has attempted to explain phenomena of this kind [metamerism] by the aid of an hypothesis propounded by van't Hoff and Lebel. According to this hypothesis, which was designed with the object of explaining the optical activity of isomeric compounds, the centre of gravity of an atom in carbon is supposed as in the middle of a tetrahedron, and its four affinities as at the four corners. . . . Wislicenus has made this hypothesis the basis of his discussions and experimental researches.—*Prof. E. v. Meyer*.
- 15605 **WOLLASTON (William Hyde, M.D., F.R.S.)** On the APPARENT DIRECTION of EYES in a PORTRAIT, with 4 fine copperplates (2 with superposed slips, showing the relation of facial expression to the eyes) by SIR THOMAS LAWRENCE, R.A., 4to. (pp. 10), *sewn (rare)*, 10s 1824  
'An ingenious explanation of the apparent direction of eyes in a portrait, illustrated by his friend Sir Thomas Lawrence'.—*D. N. B.*
- 15606 — On the ELEMENTARY PARTICLES of CERTAIN CRYSTALS (Bakerian Lecture), with plate, 4to. (pp. 15), *sewn, 3s 6d* 1813
- 15607 — On METALLIC TITANIUM, 4to. (pp. 6), *sewn, 2s* 1822
- 15608 — METHOD of DRAWING EXTREMELY FINE WIRES; and DESCRIPTION of a SINGLE LENS MICROMETER, with plate, 4to. (pp. 9), *sewn, 4s 6d* 1813  
\*This method is still used in the construction of the bolometer.—*D. N. B.*
- 15609 — On a METHOD of rendering PLATINA MALLEABLE (Bakerian Lecture), with plate, 4to. (pp. 8), *sewn (scarce)*, 7s 6d 1828  
The discovery of a method for producing pure platinum and welding it into vessels, made about 1804 and published as the Bakerian lecture in 1828, has proved of the highest importance, scientific and commercial, from the fact that the metal is attacked by extremely few chemical reagents. The Royal Society in 1828 awarded Wollaston a royal medal for his work. It was from this source that he accumulated his considerable fortune.—*D. N. B.*
- 15610 — On the PRIMITIVE CRYSTALS of CARBONATE of LIME, BITTER-SPAR, and IRON-SPAR, 4to. (pp. 4), *sewn, 2s 6d* 1812
- 15611 — SYNOPTIC SCALE of CHEMICAL EQUIVALENTS, with plate, 4to. (pp. 22), *sewn, with inscr. to Thomas Allan, F.R.S. (scarce)*, 10s 6d 1814  
'Wollaston's most important paper in theoretical chemistry. He proposes, in order to avoid undue use of hypothesis, to replace Dalton's 'atomic weights' by 'equivalents' which were to express the bare facts of quantitative analysis. Wollaston's criticism of Dalton in this paper is fundamental. . . . The battle between 'atomic weights' and equivalents lasted, with many fluctuations, down to recent times'.—*D. N. B.*
- 15612 **YOUNG (Thomas, M.D., F.R.S.)** On the THEORY of LIGHT and COLOURS (Bakerian Lecture), with plate, roy. 4to. (pp. 37), *sewn (RARE)*, 12s 6d 1801  
'A more detailed account of his doctrine of interference and its applications appeared in his brilliant memoir *On the Theory of Light and Colours*, which marks an epoch in the history of the subject. In it he showed that the colours of thin and thick plates, of striated surfaces, and those seen at the edge of the shadow of an obstacle, could all be explained by the interference of light undulations which had traversed different paths, and concluded with the proposition 'Radiant light consists of undulations of the luminiferous ether'.—*D. N. B.*
- 15613 **ZABARELLA (Giacomo Conte)** TABLE LOGICÆ, in quibus summa cum Facilitate ac Brevitate ea omnia explicantur, quæ ab aliis prolixè declarari solent, Editio postrema, 4to. *old hf. calf (joint cracked)*, with auto. and inscr. by Thomas Taylor, 'Platonist' (as below), 10s 6d (col:) *Francofurti, Laz. Zetzner, 1608*  
'Aristotelis alumni sumus nec poenitet. T. TAYLOR. ANO. 1781.'—*Inscr. on last leaf*.  
'Ses idées philosophiques, et surtout sa méthode appliquée à la Logique d'Aristote, firent autorité en Allemagne'.—*Biogr. Gén.*

## FURTHER ADDENDA.

- 15614 **ADAMS (John Couch, F.R.S., Lowndean Prof. Astronomy and Geometry, Cantab.; discoverer of Neptune)** SCIENTIFIC PAPERS, edited by WILLIAM GRYLLS ADAMS, F.R.S., and RALPH ALLEN SAMPSON, F.R.A.S., with Memoir by J. W. L. GLAISHER, F.R.S., with fine portrait on India paper, fs. of 4 p. MS., and diagrams, 2 vols. 4to. cl., 15s (p. £2. 10s) Univ. Press, Cambridge, 1896-1900



Nos. 15617-18 (page 787).

First edition of the first important star atlas.



## Das. XXII. capitel

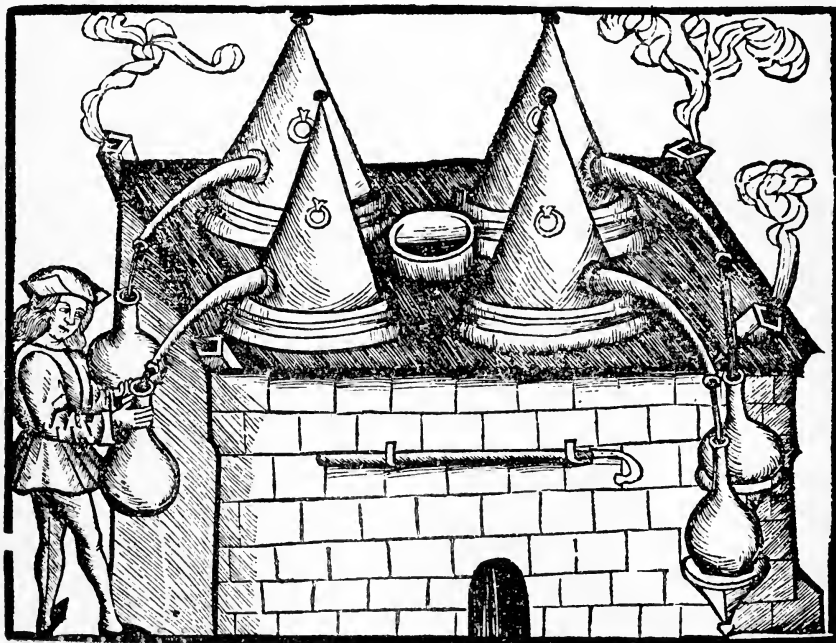
sicas colericas, das seindt bleßlin vff der  
heit die von grosser hitz entspringen. Wie  
man das bleiweiß macht ist geoffenbarer  
in seruitoribus Rasis, vnd an andern en/  
den me.

**Das. XXII. capitel** wie man  
distillieren soll per descensum / vnder sich  
vnd nit ober sich.



**S**ich dir verheiß  
sen hab in vil vñ manicherlei  
weiß vñnd maß dich zü leren  
wie man distillieren sol / be/  
zwingt mich solich gelübde weiter zü strec/  
ken vnd dir zü offenbare vñ zeigen wie mā  
sol distillieren per descensum, das ist vñnd  
sich vnd nit ober sich / als sich gebürt vñnd  
wol gezimpt in vil dinge / als du wol schē  
bist / so mā distilliert oder b:et oly vß weck  
olter / heßlin / od alten karch speichē holtz /  
zū heilen rinnēde vñ trieffende schwādē / ich  
selber gesehen hab / vñ muschat nüss oly / be

nedictē oly / von eyer dotter / vñ vil andere  
der gleichē vñ kützerüg willē anderwegē  
gelassen. Solich distillierüg mag gesche/  
hen in ein ofen gemacht von vngediand  
ten mursteinen / sierebecht in weit vñnd  
breit einer elen vñnd einn fiertail / sie einn  
stein flach neben den andern geleit gleich  
ein herd / zü ring omb der selbē murstein  
vffrecht gesetzt. in höhe von dem herd. iiii.  
fiertail einer elen / vßgenommen das for/  
teil / daruff werden ysen geleit / daruff and  
stein die rün seint / oder ziegel genät Basel  
tack im Elsaß / gleich ein glatten bodē od  
herd haben / in der mittē ein loch einer  
halben elen weit / so vß der leng gemacht  
würdt ein ring / das dar durch gon ist ein  
menschen fust. Vff dem selbigen bodē  
verd gemacht zü ring omb / vñnd vff alle  
end ein gesetzt von den steinen wie vo: in  
tieffe von dem obērn bodē / vff drit hal/  
oder drei fiertail einer elen. Des form ist  
also.



No. 15621 (page 787).

An early and rare book on distilling.

A COMPLETE SET TO 1909 :

- 15616 **ASTRONOMICAL SOCIETY (ROYAL). MEMOIRS** of the, complete from the Beginning in 1822 to 1909 (Vols. 1-59), with numerous plates (some coloured or folding), maps, and other illustrations, 59 vols. 4to., vv. 1-51 in 37 v. hf. calf gilt, and the rest in parts or boards as issued (FINE SET); SCARCE, £42. 1822-1909

A complete set of the Memoirs of the first Astronomical Society ever constituted, and containing many contributions of great value.

The earlier volumes are now out of print and VERY SCARCE.

- 15617 **BAYER (Johann) URANOMETRIA**, omnium Asterismorum continens Schemata, nova Methodo delineata, editio princeps; with fine engraved title, and 51 star-maps on copper by Alex. Mair, folio, hf. calf gilt (sound and clean copy); very rare, £3. 10s

(col. :) Augustæ Vindel., Christ. Mangus, 1603

- 15618 ——— ANOTHER COPY, old white vellum (guarding of the maps wormed, otherwise a VERY LARGE AND FINE COPY), with bookplate of MICHELANGELO GIACOMELLI, Abp. of Chalcedon (1695-1774), £4. 4s

FIRST EDITION OF THE FIRST IMPORTANT STAR ATLAS. 'Bayer, the German astronomer, was the first to improve on the old plan [of distinguishing stars by the locality they occupied and their constellations, e.g., *Oculus Tauri* for a *Tauri*], which he did by publishing in 1603 a celestial atlas, in which the stars of each constellation were distinguished by the letters of the Greek alphabet. Bayer's letters are still in common use.'—*The late G. F. Chambers, F.R.A.S.*

An earlier attempt to classify stars was made by ALESSANDRO PICCOLOMINI (c. Nos. 3625-8 and 13298 ante), who used Latin letters for distinguishing four different magnitudes.

- 15619 **BLACK (Joseph, M.D., F.R.S.E., Prof. Chemistry, Edin.) LECTURES** on the ELEMENTS of CHEMISTRY, delivered in the University of Edinburgh, now published from his MSS., by JOHN ROBISON, Prof. Natural Philosophy, Edinburgh, with fine portrait on copper, and 3 plates, 2 vols. 4to. scored calf gilt (sound copy); VERY RARE, £2. 5s Edin., 1803

'During above 30 years he inculcated the elements of chemistry upon enthusiastic and continually growing audiences. 'It could not be otherwise', Robison wrote in 1803. 'His personal appearance and manner were those of a gentleman, and peculiarly pleasing. His voice in lecturing was low, but fine; and his articulation so distinct that he was perfectly well heard by an audience consisting of several hundreds. His discourse was so plain and perspicuous, his illustrations by experiments so apposite, that his sentiments on any subject never could be mistaken, even by the most illiterate; and his instructions were so clear of all hypothesis or conjecture, that the hearer rested on his conclusions with a confidence scarcely exceeded in matters of his own experience.' His lectures had thus a powerful effect in popularising chemistry; and attendance upon them even came to be a fashionable amusement'.—*D. N. B.*

LORD LISTER'S COPY :

- 15620 ——— : **ESSAYS and OBSERVATIONS, PHYSICAL and LITERARY**, read before a [the PHILOSOPHICAL] SOCIETY in EDINBURGH, and published by them, VOLS. II-III, with numerous folding copperplates, 2 vols. 8vo. old calf gilt (2 joints cracked, otherwise a very sound and large copy); VERY RARE, £2. 10s *ibidem*, 1770-1

Vol. II of this now very rare publication is of great importance as it first contains (on pp. 172-248) Dr. JOSEPH BLACK'S classic 'Experiments upon Magnesia Alba, Quick-lime, and some other Alkaline Substances', a description of which may be found under BLACK (p. 318, No. 6248). It also includes (pp. 159-71) the important essay by WILLIAM CULLEN, M.D., F.R.S., 'Of the Cold produced by evaporating Fluids, and of some other Means of producing Cold', containing the discovery of latent heat, and the author's theory of 'specific heat'; also 'A Solution of Kepler's Problem', by MATTHEW STEWART, F.R.S. (in v. III), a Letter from BENJAMIN FRANKLIN to David Hume, on the 'Method of securing Houses from the Effects of Lightning', and the important essay by THOMAS MELVILLE, 'Observations on Light and Colours', containing fundamental experiments in spectrum analysis; besides numerous contributions (some important) on medical and other subjects.

The above copy is of special interest as having belonged to LORD LISTER, F.R.S.

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— *v. Proteids.*
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- ALCOHOL—*v. Distilling.*  
— (SYNTHETIC): [1865. 9140] Hennell. 1828. [10832] Lieben. 1867-9. [14137] Reynolds. 1873.  
— —, ACTION OF ELECTRICITY ON: [7002] Connell. 1835.  
— —, RADICALS—*v. Alkyl.*

ALCOHOLOMETRY : [6054] Baumhauer en van Moorsel. 1861. [6256] Blagden. 1790-2.

— v. *Excise Tables*.

ALGEBRA (DOUBLE) : [3095] Morgan. 1849. [9064] Hayward. 1892. [12131] Morgan. 1849. [16115] Hayward. 1892. [16407] Morgan. 1849.

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— v. *Geometry (Algebraic)*.

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ALGEBRA (INDUCTIVE) : [4524] Sparkes. 1881.

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ALGEBRAIC DEVELOPMENT : [2132] Jarrett. 1831.

ALKALIS : [531] Boyle. 1676. [2286] Kingzett. 1877. [6248] Black. 1777. [8906] Hare. 1840. [9885] Jones 1902. [10150] Kingzett. 1877. [11099] Lunge and Hurter. 1891. [11980] Moissan. 1905. [14223] Richardson and Watts. 1863-7. [15542] Wiegleb. 1781. [15620] Edinburgh Essays. 1770-1. [SS 1583-4] Boyle. 1675.

— v. *Chloride Process. Soda Industry*.

ALKALOIDS : [1697] Guareschi. 1896. [2292] Kippenberger. 1895. [4259] Schmidt. 1900. [8549] Graham. 1848. [8729] Guareschi. 1896. [9505] How. 1854. [9933-43] Jowett. 1897-1905. [14582] Runge. 1820. [15568] Winterstein und Trier. 1910.

— v. *Caffeine. Conine, Mudarine. Piomaine. Pyridine. Quinine*.

ALKYL : [8103] Frankland. 1877. [11758-9] Menschutkin. 1890-5. [14613] Sabatier et Senderens. 1905.

ALLOPHANE : [12732] Northcote. 1857.

ALLOTROPISM : [7789] Faraday. 1853.

ALLOYS—v. *Metallic Alloys*.

ALLUVIUM : [5545] Yates. 1831.

ALMANACS : [3077] Morgan. 1907. [8086] Franceur. 1830. [12089. 12099] Morgan. 1845-71. [12155-6] Morland. 1673.

— v. *Calendar. Chronology. Ephemerides*.

ALTITUDE AND AZIMUTH TABLES : [438] Block. 1875. [S 3715] Ball. 1907.

ALUM : [4516] Sorel. 1902. [11419] Marggraf. 1767-8.

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— *v. Cryolite. Mica.*
- AMALGAMATION PROCESSES: [5108] Vivian. 1825. [6339-42] Born. 1786-91. [14202] Richards. 1906.
- AMIDO-COMPOUNDS AND AMINES: [11758-9] Menschutkin. 1890-5. [13749] Przyłuska. 1909. [14542] Rowney. 1855.
- AMMONIA AND ITS COMPOUNDS: [163] Arnold. 1889. [3790-1] Priestley. 1774-7. [5092] Vincent. 1884. [5704] Alberti. 1780. [5836] Arnold. 1889. [6521] Bronn. 1905. [8717] Grossmann. 1906. [9006] Hatchett. 1796. [9160] Henry. 1809. [9989] Kane. 1839. [11095] Lunge. 1887. [12666] Nicol. 1882. [13261] Phipson. c. 1863. [14475] Rose. 1834. [SS 2804] Lunge. 1900.  
— *v. Sal Ammoniac. Saltpetre.*
- AMYL. [8114] Frankland. c. 1851. [11712] Medlock. n. d.
- ANALYSER: [5690] Airy. 1832.  
— *v. Polarscope.*
- ANALYSIS (CHEMICAL)—*v. Chemical Analysis.*  
— (COMBINATORY): [3316] Nicholson. 1818. [9300] Hindenburg. 1796. [11806] Meyer. 1838. [16429] Netto. 1901. [16667] Spehr. 1840. [S 1081] Pfaff. 1797. [SS 626] Macmahon. 1916.  
— *v. Combinations and Permutations.*  
— (DIOPHANTINE): [6998] Collins. 1858.  
— (FACTORY): [4754-5] Tate. 1845.  
— (INDETERMINATE): [4239] Scheffler. 1854. [16278] Le Besgue. 1859. [SS 273] Cataldi. 1618.  
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— , THEORIES OF: [S 450] Baire. 1907-8.  
— (PRACTICAL [MATHEMATICAL]): [16559] Sanden. 1914.  
— (RESIDUAL): [2423] Landen. 1758-64.  
— *v. Functions (Analytic).*  
— SITUS: [2644] Listing. 1848. [10695] Leibniz. 1768. [10888] Listing. 1848. [14241] Riemann. 1876. [16307] Listing. 1848.  
— *v. Knots, Theory of.*
- ANALYTICAL THEOREMS: [10061] Kelvin. 1845. [11182] Macfarlane. 1893.
- ANALYTICAL AND GEOMETRICAL METHODS COMPARED: [5488] Woodhouse. 1802.
- ANAMORPHOSES (OPTICAL): [14740-1] Schott. 1657-9.
- ANCHOR: [13106] Pering. 1819.
- ANEMOMETERS: [3492] Pastorelli. c. 1875. [5457] Wolf. 1709. [6126] Bennet. 1792. [12483] Newman. 1840. [14360-1] Robinson. 1850-80. [15522] Whewell. 1837.
- ANGLES (CONTIGUOUS): [10727] Léotaud. 1663. [15453] Wallis. 1685. [SS 926] Viviani. 1674.
- ANGULAR SECTIONS, ANALYSIS OF: [S 3866] Poinset. 1825.
- ANILINE AND ITS DERIVATIVES: [9376] Hofmann. 1862. [12649] Nicholson. 1847. [13504-5] Pope. 1892-5. [14011] Riemann. 1868. [14413] Romburgh. 1900. [S 3018] Crace-Calvert. 1878.  
— *v. Rosolic Acid.*
- ANNUITIES—*v. Interest Tables. Mathematical Tables. Mathematics (Insurance).*
- ANTHRACENE: [5875] Auerbach. 1877. [SS 2412] Auerbach. 1880.
- ANTIMONY AND ITS COMPOUNDS: [288. 6031-3] Basilius Valentinus. 1646-1893. [8369] Gesner. 1599. [11052] Löwig. 1850. [13047] Pearson. 1791.
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- ARGON: [3137] Mugdan. 1896. [13952] Rayleigh and Ramsay. 1895. [14802] Sedgwick. 1896.
- ARITHMETIC ('AUTOMATIC'): [4227] Sawyer. 1878.  
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— (DUAL): [6650. 6654] Byrne. 1863-7.  
— (ELEMENTARY): [114] Annet. c. 1750. [185] Ayres. 1730. [274] Barrême. 1740. [987] Deidier. 1839. [1543] Girdlestone. 1892. [1928-9] Hind. 1842-5. [2462] Lardner. 1836. [2766] Macmillan. 1811. [3081-4] Morgan. 1830-46. [3732] Potts. 1876. [4203] Sang. 1856. [4341] Serret. 1852. [4491] Soave. 1796-7. [5166] Walkingame. 1781. [5333] Weston. 1736. [5656] Adhémar. 1834. [6383] Bourdon. 1838. [6529] Brook-Smith. 1877-82. [6965-7] Cocker. 1712-67. [7084] Crivelli. 1728. [7242] Denza. 1871. [7299] Dilworth. 1773. [7335] Donn. 1769. [7924-5] Fisher. 1748-84. [10483] Langley. 1895. [10535] Lardner. 1834. [10670] Lees. 1826. [11424] Mariani. 1876. [12104] Morgan. 1850-6. [12984] Parsons and Wastell. 1703. [15490] Webster. 1740. [15546] Wilkens. 1719. [16327] Lübsen. 1906.  
— *v. Ready Reckoner.*

ARITHMETIC (GENERAL): [2786] Malcolm. 1730. [7545] Emerson. 1763. [9283-5] Hill. 1721-61. [10171] Kirkby. 1735. [11313] Malcolm. 1730. [11487-8] Martin. 1735. [13038-9] Peacock. 1826. [13041] Peano. 1902. [15107] Stolz. 1885-6. [15202] Tannery. 1894. [15988] Farber. 1911. [16604] Schröder. 1873. [16820-1] Schurig. 1883-5. [16668-9] Spitz. 1873-82. [16673] Staudacher. 1890-1. [16688] Stolz. 1885-6. [16771] Weitzel. 1910.

— (HIGHER)—*v. Numbers, Theory of.*

— (PRACTICAL): [1634] Gray. 1864-5. [2948] Merrifield. 1872. [3446] Panizza. 1894. [4533-4] Spinucci. 1778. [6936-9] Clavius. 1585-1613. [7765] Fantucci. 1749. [8032] Forestani. 1682. [8268] Garatti. 1686-8. [8795] Halbert. 1789. [9047-50] Hawney. 1730-75. [11075] Lugo. 1754. [11523] Martino. 1786. [12048] Mora. 1786.

— *v. Mercantile Tables. Ready Reckoner.*

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ARITHMETIC, EARLY WORKS ON (TO 1700), *continued*: [14833] Sfortunati. 1534. [15081] Stevinus. 1625. [15084] Stifel. 1544. [15093] Stockman. 1648. [15194-5] Tacquet. 1665-80. [15213] Taylor. 1816. [15371] Valla. 1611. [15589-95] Wingate. 1652-1760. [S 480] Boetius. 1867. [S 514] Bronkhorst. 1539. [S 588] Colebrooke. 1817. [S 642] Diophantus. 1890. [S 3878-9] Tapp. c. 1620-58. [SS 177-80] Baker. 1591-1659. [SS 265] Cardinael. 1674-8. [SS 297] Chauvet. 1640. [SS 316-26] Cocker. 1697-1767. [SS 328] Coets. 1698. [SS 347] Dansie. 1627. [SS431] Forestani. 1603. [SS 562] Lantz. 1621. [SS 577] Le Gendre. 1682. [SS 587] Leybourn. 1657. [SS 791] Rocha de Gerona. 1564-5. [SS 802] Salignac. 1580. [SS 906] Tunstall. 1529.

— *v. Mercantile Tables. Ready Reckoner.*

—, HISTORY OF: [2566-8] Leslie. 1817-20. [3732] Potts. 1876. [8834. 8839] Halliwell-Phillipps. 1839. [12085-6. 12119] Morgan. 1847-50. [13038-9] Peacock. 1826. [15997] Fine. 1907.

—, PRINCIPLES AND ELEMENTS OF: [2566-8] Leslie. 1817-20. [3081-4] Morgan. 1830-46. [6354] Borne. 1795. [7056] Cox. 1885. [10748] Leslie. 1820. [11022] Lorenz. 1803. [12104] Morgan. 1850-6. [16015] Frege. 1893-1903. [16240] König. 1914.

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— OF POSITION: [16452] Noth. 1882.

— WITH 16 TO THE BASE: [3356] Nystrom. 1862.

ARITHMETICAL MEANS, METHOD OF: [12446] Neumann. 1887-8.

— *v. Means (Arithmetico-Geometrical).*

— PROBLEMS AND EXERCISES: [16118-19] Heis. 1886-1905. [16141-2] Hirsch. 1890-2. [S 706] Fitz-Patrick et Chevrel. 1900.

— RECREATIONS: [6647] Butler. 1838. [8071] Fourrey. 1899. [16014] Fourrey. 1904. [S 947] Lucas. 1895.

— TRIANGLE: [3477] Pascal. 1665. [4744] Tartaglia. 1556-60. [12997] Pascal. 1665.

— *v. Numbers (Trigonal).*

ARMATURE REACTION: [9044] Hawkins. *n.d.*

ARMATURES OF DYNAMOS: [5835] Arnold. 1896. [9170] Hering. 1887. [12982] Parshall and Hobart. 1895.

ARSENIC AND ITS COMPOUNDS: [8558-9] Graham. 1833. [12801] Odling. *n.d.* [13098] Penny and Wallace. 1852. [14697] Scheele. 1786.

—, ACTION ON FERMENTATION BY: [13069] Pedersen. 1902.

ARTILLERY—*v. GUNNERY.*

AS, MATHEMATICAL TREATISE ON THE: [S 455] Glareanus. 1551.

ASBESTOS: [15268] Thomson. 1831.

ASPHALT: [5850] Asphalte. 1887. [7224] Delano. 1893. [10752] Letouzé et Loyeau. 1897. [11325-6] Malo. 1866-86.

— *v. Bitumen.*

ASSAYING: [1497] Gay-Lussac. 1832. [2278.] Kerl. 1883. [3016-17] Mitchell. 1873-88. [3417] Overman. 1854. [4178] Sage. 1780. [5770] Anrye et d'Arcet. 1813. [6143] Beringer. 1898. [6175] Berthier. 1834. [6823] Chaudet. 1835. [7062] Cramer. 1764. [7592] Ercker. 1629. [10114] Kerl. 1883. [11938-41] Mitchell. 1873-88. [12731] North. 1874. [13179-82] Pettus. 1683-6. [13402] Plattner.

ASSAYING, *continued*:

1849. [14233] Ricketts. 1880. [14624] Sage. 1780. [15378] Vauquelin. 1812. [S 3188] Budge. 1825. [S 3209] Cramer. 1754. [S 3232] Furman. 1899.

— *v. Blowpipe Analysis.*

ASTROLABE: [951-2] Danti. 1569-78. [2320] Köbel. 1594. [4022] Ritter. 1613. [4037\*] Roias. 1551. [4614-15] Stoeffler. 1535-94. [6279-81] Blundeville. 1597-1636. [7168] Danti. 1569. [8335] Gemma. 1567. [11803] Metius. 1632-3. [14026] Reisch. 1512. [15095] Stöffler. 1553. [S 3716] Blundeville. 1594. [SS 496] Henricus. 1621. [SS 936] Vols. 1718.

ASTROLOGICAL CLOCK: [4478] Smyth. 1848.

ASTROLOGY: [670] Camerarius. 1536. [685] Cardano. 1555. [3419-20] Oxley. 1834-48. [4653] Struve. 1860. [5335-6] Wharton. 1683. [8199] Galgemail. 1616. [8251] Gallucci. 1593. [9455] Hopton. 1616. [9672] Institutions. 1643. [11281, 11283-6] Magini. 1582-1630. [11955-6] Mizauld. 1551-5. [11996] Moleti. 1563. [12147] Morin. 1661. [12686] Nifo. 1614. [12781] Oderico. 1653. [13717] Proctor. 1875. [13762] Ptolemaeus. 1646. [13909] Rantzaus. 1625. [14026] Reisch. 1512. [14669] Satler. 1605. [14690] Savonarola. 1582. [SS 980] Albumasar. 1489. [SS 990] Argoli. 1638. [SS 1020] Cattan. 1567. [SS 1110] Gallucci. 1589. [SS 1151] Kalendar. 1522. [SS 1220-1] Origanus. 1609-45. [SS 1283] Salmasius. 1648. [SS 1293] Savonarola. 1581. [SS 1346] Zoboli. 1619.

— *v. Meteorology (Astrological).*

— (JUDICIAL): [953] Dariot. 1653. [1478] Gassendi. 1659. [2320] Köbel. 1594. [4729-30] Taisnier. 1562. [7916] Firmicus Maternus. 1499. [11283] Magini. 1582-1616. [12147] Morin. 1661. [13516] Porta. 1616. [SS 1045] Colombe. 1606. [SS 1220] Origanus. 1645. [SS 1267-8] Regiomontanus. 1584.

ASTROMETRY: [7988] Foerster. 1888.

ASTRONOMICAL CALCULATIONS: [2842-3] Martin. 1765-73. [10420] Lalande. 1762.

— CORRESPONDENCE: [6157] Bernoulli. 1771.

— DECLINATIONS (MEAN): [12463] Newcomb. 1896. [12764] Nyrén. 1893.

— ESSAYS: [445] Bode. 1793-7. [2764] Maclear. 1851. [3814-15, 3818-19, 3822-7, 3829, 3838-9] Proctor. 1872-92. [4702] Sylvester. 1866. [8536] Gore. 1888. 13699-702. 13711-14. 13717. 13724] Proctor. 1872-89. [16849] Gore. 1907.

— FORMULÆ: [232] Baily. 1827. [3554] Peters. 1871.

— INSTRUMENTS: [557] Brahe. 1602. [751] Challis. 1879. [1996] Horrebow. 1740-1. [2387] La Hire. 1735. [2716] Ludlam. 1769. [3911] Recorde. 1551. [5790-1] Apianus. 1532-3. [6439] Brahe. 1602. [6729] Carl. 1863. [7367] Dreyer. 1881. [8504] Gompertz. 1824. [10418] Lalande. 1771-81. [10453] Lamont. 1851. [10713] Le Monnier. 1774. [11130] Lupicini. 1582. [11272] Magellan. 1780. [11642-3] Mauro. 1550. [11646-7] Maurolico. 1575. [12854] Oudemans. 1865. [12924] Padovani. 1563. [13512] Porro. 1858. [16817] Ambron. 1899. [S 1353] Apianus. 1533. [SS 1046] Colombe. 1608. [SS 1202-3] Metius. 1626.

— *v. Astrolabe. Astronomical Ring. Circle (Repeating). Cosmoline. Diptheoscope. Equatorial. Globe Making. Gnomon. Heliotemer. Horizontal I. Longitude Scale. Meridian Circle. Meridian Dial. Mesolabe. Orreries. Quadrant. Quadrant (Mural). Repsold's Universal I. Siderostat. Telescope. Theodolite. Transit Circle. Transit Instrument.*

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— LECTURES: [60] Airy. c. 1850. [2229-31] Keill. 1725-60. [3116] Moseley. 1839. [4211] Saunderson. c. 1730. [4321] Segner. 1775-6. [5382] Whiston. 1715. [5677-8, 5696-7] Airy. c. 1850-6. [10022-7] Keill. 1718-69. [12198-200] Moseley. 1846-54. [14671] Saunderson. c. 1712. [15525, 15529] Whiston. 1707-28.

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— MICROMETRY—*v. Micrometry (A).*

— MYTHS: [429, 6261] Blake. 1877. [7943] Flammarion. 1877. [13431] Pluché. 1740. [13708-9] Proctor. 1878-89.

— *v. Constellations.*

— OBSERVATIONS: [174] Astronomical. 1838-77. [387] Bianchini. 1737. [416] Biot. 1821. [424] Bishop. 1852. [445] Bode. 1793-7. [558] Brahe. 1666. [638] Buggé. 1784. [707-8] Carrington. 1855. [712] Cassini. 1693. [1350] Flamsteed. 1725. [1359] Fontana. 1646. [1902] Herschel. 1847. [1904] Herschel and South. 1825. [2541] Le Monnier. 1741. [2716] Ludlam. 1769. [2882] Maskelyne. 1765. [3617] Picard. 1731. [3700] Pond. 1815-19. [3871] Radcliffe Observatory. 1858-80. [4137] Rümker. 1829. [4470-2] Smyth. 1858-77. [4627] Stone. 1877. [5578] Zach. 1784. [5973] Barclay. 1870-8. [6670] Calandrelli. 1860. [7515] Ellery. 1866-84. [7876] Feuillée. 1714-25. [7949-50] Flamsteed. 1725. [7999] Fontana. 1646. [8318] Geelmuyden. 1900. [8648-9] Greenwich Observations. 1875-1910. [10714] Le Monnier. 1741. [11268-71] Madras Observatory. 1887-99. [13386] Plana. 1828. [13821] Radcliffe Observatory. 1885-1910. [13852] Rambaut. 1900. [15137] Streeet. 1710. [15461] Washington Astronomical and Meteorological Observations. 1878-85. [S 49] Cordoba Observations. 1881-1914. [S 51] Dunsink Observatory. 1870-1900. [S 114] Lick Observatory Bulletins. 1901-16. [S 209]

- ASTRONOMICAL OBSERVATIONS, *continued*:  
 Washburn Observatory. 1882-93. [S 211]  
 Yerkes Observatory. 1900-3. [S 1411] Cohn.  
 1909.  
 — *v. Chronometrical O. Lunar O. Planetary O.*  
 — — —, COMBINATION OF: [3216] Newcomb.  
 1880.  
 — *v. Observations.*  
 — OBSERVATORIES: [1964] Holden. 1896. [2501]  
 Lawson. 1844. [3613] Piazzi. 1792-4. [5675]  
 Airy. 1845. [6241] Bishop. 1852. [8420-6]  
 Gill. 1887-1906. [10554] Lassell. 1867. [10615]  
 Lawson. 1844. [13801] Quetelet. 1831.  
 [S 1613] Struve. 1845.  
 — PARADOXES: [1703] Gumpach. 1863. [1792]  
 Harris. 1876. [3746] Pratt. 1863. [3755-6]  
 Prescott. 1803-23. [3930] Reddie. 1865.  
 [5969] Bamfield. 1764. [5970] Banks. 1829.  
 [12163] Morrison. 1868. [13708-9] Proctor.  
 1878-89. [13975. 13977] Reddie. 1862-3.  
 — *v. Astronomy (Cometary) P. Flat Earth P. Lunar  
 Rotation P. Planetary Theory P. Solar P.*  
 — — — PHOTOGRAPHY—*v. Photography (A.).*  
 — — — PROBLEMS: [5076] Villié. 1885-90. [12473]  
 Newcomb. 1898. [14879] Simpson. 1730-58.  
 — — — REDUCTIONS: [14265] Ristenpart. 1902.  
 — — — REFRACTION—*v. Refraction (Atmospheric).*  
 — RING: [5787-9] Apianus. 1550-74. [SS 200]  
 Beausard. 1553.  
 — — — SPECULATIONS: [3744] Pratt. 1894. [5444]  
 Wilson. 1856.  
 — — — STANDARD SCALE: [5934] Baily. 1836.  
 — — — TABLES: [90] Alphontius. 1483. [232] Baily.  
 1827. [996] Delambre. 1806-17. [1374]  
 Förster. 1869. [1584] Goldmayr. 1639.  
 [1753-5] Halley. 1749-52. [2276] Kepler. 1627.  
 [2387] La Hire. 1735. [2393] Lalande. 1771.  
 [2431] Lansberg. 1632. [3193] Nautical  
 Almanac. 1770-1876. [3554] Peters. 1871.  
 [3926] Regiomontanus. 1557. [4368] Sheep-  
 shanks. 1846. [5735] Alphonus. 1545. [5915]  
 Bagay. 1829. [5919-20] Baily. 1827. [6197-  
 6200] Bessel. 1818-30. [6298] Boileau. 1850.  
 [6760-1] Cassini. 1740-56. [7408] Dunn.  
 1784. [8827] Halley. 1749. [10104] Kepler.  
 1627. [10413] La Hire. 1755. [11143-4] Lynn.  
 1827-43. [11286. 11288] Magini. 1583-5.  
 [11348] Manginon. 1626. [12148] Morin. 1675.  
 [13058] Pearson. 1824. [13760] Ptolemæus.  
 1605. [14014] Reinhold. 1554. [14030]  
 Renieri. 1647. [15626] Bauschinger. 1901.  
 [SS 999] Bartsch. 1624. [SS 1004] Bianchini.  
 1495. [SS 1223] Pearson. 1824-9.  
 [SS 1265. 1267-8] Regiomontanus. 1496-1585.  
 [SS 1271-2] Riccioli. 1651.  
 — *v. Altitude and Azimuth T. Ephemerides.  
 Horary T. Lunar T. Nautical T. Planetary T.  
 Polar Distances. Refraction T. Solar T. Zenith  
 Distances.*  
 — — — THESES: [4340] Serret. 1847. [7106] Crompt.  
 1598. [14378] Roche. 1844. [14379] Roche-  
 more. 1769. [14382] Rodrigues de Passos.  
 1853.  
 — — — VORTEX THEORY—*v. Vortex Theory (A.).*  
 — — — WORKS (COLLECTED): [2661] Lockyer.  
 1868-90. [9190] Herschel. 1912. [15614]  
 Adams. 1896-1900. [16877] Laplace. 1843-7.
- ASTRONOMY (CHINESE AND OLD JAPANESE): [410]  
 Biot. 1862. [4251-2] Schlegel. 1875. [5424]  
 Williams. 1871. [7367] Dreyer. 1881. [10233]  
 Knobel. 1905.  
 — *v. Astronomy (Oriental).*

- ASTRONOMY (COMETARY): [1188] Englefield. 1793.  
 [1259] Euler. 1744. [1447] Galilei. 1623. [1653-4]  
 Gregory. 1726. [1707-8] Guillemin. 1875-7.  
 [1753-5] Halley. 1749-52. [1930-1] Hind.  
 1852-7. [1936] Hirn. 1889. [1999] Horrocks.  
 1678. [2264] Kepler. 1619. [2313] Klinken-  
 berg. 1755. [2400] Lambert. 1761. [2543-4]  
 Le Monnier. 1743. [2710] Lubbock. 1832.  
 [3256-69] Newton. 1713-1871. [3374] Oppolzer.  
 1880-2. [3380] Olbers. 1797. [3638] Pingré.  
 1783-4. [3781] Prince. 1883. [3867] R. (J. A.).  
 1873. [4447] Smith. 1744. [4654. 4658] Struve.  
 1859-68. [5216] Ward. 1654. [5388] Whiston.  
 1716. [5424] Williams. 1871. [5806-7] Arago.  
 1833-61. [5907. 5909] Backlund. 1881-92.  
 [6759] Cassini. 1681. [7143] Damoiseau et  
 Pontécoulant. 1835. [7584] Engström. 1881.  
 [7810] Faulhaber. 1619. [7886] Fievez. 1881.  
 [8221-2] Galilei. 1623. [8311] Gautier. 1888.  
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 [8654-5] Gregory. 1715-26. [8726-7] Grynaeus.  
 1580. [8767] Gylden. 1884. [8848] Hamilton.  
 1772. [9057] Hayn. 1889. [9294-5. 9298] Hind.  
 1848-57. [9432] Hooke. 1705. [9528-9] Huggins.  
 1882. [9776] Jelinek. 1848. [9958] Julius.  
 1867. [10217] Klinkerfues. 1880. [10255]  
 Koerber. 1887. [10270] König. 1891. [10305-6]  
 Kreutz. 1882-1901. [10762] Leveau. 1877.  
 [10943] Loewy. 1858-9. [11237. 11239]  
 Maclear. 1853-60. [11636] Mauerpertuis. 1742.  
 [11754-5] Merfield. 1899-1901. [11821] Meyer.  
 1882. [11893] Milne. 1828. [11943-5] Miscel-  
 lanea Curiosa. 1708-27. [11966] Mohn. 1861.  
 [11998-9] Möller (A.). 1862-73. [12002]  
 Möller (J.). 1901. [12279] Müller. 1619.  
 [12501-24] Newton. 1687-1871. [12773]  
 Nüssler. 1719. [12856. 12860] Oudemans.  
 1857-9. [13348-9] Pingré. 1783-4. [13446-7]  
 Plummer. 1883-94. [13494] Ponthaus. 1681.  
 [13675] Prince. 1883. [13830-1] Ragona.  
 1854-8. [13853] Rambaut. 1910. [14240]  
 Riem. 1896. [14393] Rohde. 1797. [14668]  
 Santucci. 1611. [14960] Snell. 1619. [15149]  
 Struve. 1853. [15530] Whiston. 1716. [S 324]  
 Hooke. 1678. [S 1450] Galle. 1894. [SS 1017]  
 Brahe. 1610. [SS 1027] Cassini. 1665.  
 [SS 1034] Comètes. 1770-80. [SS 1040] Clairaut.  
 1760. [SS 1054-5] Cysat. 1619. [SS 1127-8]  
 Guiducci. 1619. [SS 1184] Manzini. 1665.  
 [SS 1218] Olbers. 1847.  
 — *v. Encke's Comet. Orbits (Planetary and Comet-  
 ary). Perturbations.*  
 — — — PARADOXES: [10382] Lacy. 1779.  
 [12162] Morrison. 1860. [13742] Prusol. 1879.  
 — — — (ELEMENTARY): [252] Ball. 1880. [1605]  
 Gore. 1890. [1932] Hind. 1853. [2343-5]  
 La Caille. 1755-64. [2542] Le Monnier. 1746.  
 [2665] Lockyer. 1883-6. [3247-8] Newton.  
 1728-31. [4058] Rolfe and Gillet. 1868.  
 [5271] Watts. 1752. [5485] Woodhouse. 1812.  
 [5703] Ajasson de Grandsagne. 1835. [5977-8]  
 Barlow. 1822. [6319-24] Bonnycastle. 1786-  
 1822. [6506] Briot. 1878. [7223] Delambre.  
 1813. [8289-91] Gassendi. 1653-83. [8671]  
 Gregory. 1808. [8702-3] Grinhorpe. 1876.83.  
 [9296] Hind. 1863. [10359-60] La Caille.  
 1750-64. [10953-4] Lockyer. 1868-89. [12328]  
 Mylne. 1819. [14830] Settele. 1818-19. [16815]  
 Alliaume. 1913. [16823] Ball. 1903. [16842]  
 Flotow. 1911. [16889] Moulton. 1906. [16898]  
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 — — — (FIELD)—*v. Explorer's Science. Geographical  
 Determination of Places.*  
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ASTRONOMY (GENERAL), *continued* :

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ASTRONOMY (PHYSICAL): [412-13] Biot. 1810-57. [650] Burr. 1865. [1425] Frisi. 1768. [1610] Gouÿe. 1688. [1626] Grant. 1852. [1656] Gregory. 1893. [5603] Abbott. 1870. [6227] Biot. 1841-57. [8262] Gámaches. 1740. [8579] Grant. 1852. [9231] Herschel. 1827. [11694] Mayer. 1848. [14884-5] Simpson. 1757.

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— *v. Globes, Use of the.*

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— *v. Astronomical Tables. Refraction Tables. Stargazing.*

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ASTRONOMY (PRE-NEWTONIAN), *continued* :

1556. [14164-5] Riccioli. 1651-65. [14437]  
Rosaccio. 1604. [15136-7] Streeet. 1663-1710.  
[15555-8] Wilkins. 1640-84. [15588] Wing.  
1651. [S 1416-17] Copernicus. 1873. [S 1559]  
Neander. 1561. [S 3716] Blundeville. 1594.  
[SS 1017] Brahe. 1610. [SS 1057-8] Deusing.  
1643. [SS 1271-2] Riccioli. 1651. [SS 1332]  
Walker. 1684.

— *v. Cosmography.*

— (PTOLEMAIC) : [119-20] Apianus. 1550-75.  
[819] Clavius. 1602. [2774] Magini. 1589.  
[3332] Nifo. 1508. [3561] Peucer. 1553-4.  
[3564-5] Peuerbach. 1515-51. [3625-9]  
Piccolomini. 1540-79. [4017] Ringelbergh.  
1535. [4085] Ross. 1646. [4170-4] Sacro  
Bosco. 1488-1629. [4268] Schreckenfuchs.  
1556. [4614] Stoeffler. 1535. [5744] Amico.  
1537. [6070] Beati. 1662. [6610] Buonin-  
contro. 1491. [6944-5] Clavius. 1570-96.  
[7908] Fine. 1538. [8251] Gallucci. 1593.  
[8336] Gemma Frisius. 1553. [8732] Guilelmus.  
1531. [11642-3] Mauro. 1550. [12232] Moya.  
1573. [13090] Pemble. 1630. [13165] Petau.  
1630. [13191] Peuerbach. 1557. [13296-9]  
Piccolomini. 1540-68. [13515-16] Porta.  
1614-16. [14026] Reisch. 1512. [15095-6]  
Stöffler. 1534-53. [15370] Valla. 1502.  
[15634] Nuñez. 1592. [S 1487] Hill. 1599.  
[S 1678] Bacon. 1614. [SS 1110] Gallucci.  
1589. [SS 1240] Pighius. 1522. [SS 1262]  
Ricci. 1521.

— *v. Primum Mobile.*

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1761. [4475-7] Smyth. 1844-81. [4648]  
Struve. 1847. [6951] Clerke. 1905. [8989-90]  
Harzer. 1901-10. [9072] Heath. 1905. [9769-  
70] Jeans. 1848-68. [10246] Kobold. 1906.  
[11629 11637] Mauerpertuis. 1742-68. [11815]  
Meyer. 1887. [12959-60] Parkes. 1887-8.  
[13302] Pickering. 1880. [16819] André.  
1899-1900. [16833-4] Clerke. 1903-5. [16853]  
Hale. 1909. [18873] Kobold. 1906. [16896]  
Newcomb. 1904. [16908-9] Scheiner. 1908-12.  
[16912] Secchi. 1878. [16913] Seeliger. 1898-  
1909. [S 1499] Kippax. 1914.

— *v. Stellar.*

— (SPHERICAL) : [623] Brünnow. 1851. [736]  
Cavalieri. 1690. [767] Chauvenet. 1868.  
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13. [2780] Main. 1863. [6562-5] Brünnow.  
1851-72. [6833] Chauvenet. 1871. [10047]  
Kelly. 1796. [11302] Main. 1863. [12465]  
Newcomb. 1906. [16268] Laska. 1906.  
[16826] Ball. 1908. [16830] Brünnow. 1869-  
72. [16837] Chauvenet. 1889. [16878] Laska.  
1889. [16883] Main. 1863. [16895] New-  
comb. 1906. [S 1559] Neander. 1561.  
[SS 890-2] Theodosius. 1558-86.

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## ASTRONOMY, CYCLOPÆDIAS AND DICTIONARIES OF,

*continued* :

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[16914] Valentiner. 1897-1902. [SS 1271-2]  
Riccioli. 1651.

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[429] Blake. 1877. [823-4] Clerke. 1885-93.  
[874] Costard. 1767. [995] Delambre. 1817-27.  
[998] Delambre. 1810. [1002] Delaunay.  
1867. [1626] Grant. 1852. [2435-7] Laplace.  
1813-35. [2541] Le Monnier. 1741. [2580]  
Lewis. 1862. [2664] Lockyer. 1894. [2695]  
Loomis. 1856. [2770] Macpherson. 1906.  
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[5304] Weidler. 1741. [6261] Blake. 1877.  
[6542] Brown. 1899-1900. [6950] Clerke.  
1893. [7033] Costard. 1767. [7368] Dreyer.  
1880. [7943] Flammarion. 1877. [8579]  
Grant. 1852. [9359] Hofer. 1873. [10022-7]  
Keill. 1718-69. [10502 10504] Laplace.  
1824-63. [10714] Le Monnier. 1741. [10785]  
Lewis. 1862. [10885] L'Isle. 1738. [11016]  
Loomis. 1851. [12245] Macpherson. 1906.  
[11803] Metius. 1632-3. [12350-2] Narrien.  
1833-50. [14164] Riccioli. 1651. [15347]  
15351] Turner. 1901-4. [16922] Wolf. 1890-3.  
[S 1373] Berry. 1898. [S 1392] Bryant. 1907.  
[S 1523] Lebon. 1899. [SS 1271-2] Riccioli.  
1651. [SS 1332] Walker. 1684.

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Salusbury. 1661. [5345-7] Whewell. 1834-52.  
[5383] Whiston. 1725. [6812] Chalmers.  
1854-6. [7235] Derham. 1741. [7857] Fer-  
guson. 1775. [11617-18] Maunder. 1909.  
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1717. [SS 2025] Rheita. 1645.

ASTROPHYSICS—*v. Astronomy (Sidereal). Physics (Cosmic).*

ATMOSPHERIC ABSORPTION : [10484-5] Langley.  
1884.

— HYPOTHESIS OF EPIDEMICS : [14589] Russell.  
1892.

— PRESSURE—*v. Barometry.*

—, PHYSIOLOGICAL EFFECT OF : [6158]  
Bert. 1878.

— REFRACTION—*v. Refraction (Atmospheric).*

— TEMPERATURE : [2025] Humboldt. 1817.  
[3738] Powell. 1825. [5864] Atkinson. 1825.  
[7298] Dyk. 1876. [7429] Dyer. 1856.  
[9317] Hirn. 1882. [11395] Marcet. 1861.  
[11943-5] Miscellanea Curiosa. 1708-27.  
[13471] Poisson. 1837. [13637] Prévost. 1792.  
[13796 13805-6] Quetelet. 1836-45. [14755]  
Schumacher. 1843. [14841] Six. 1788.  
[15550] Williams. 1806. [S 2508] Dove. 1852.  
— *v. Heat (Solar). Isotherms. Radiation (Terres-  
trial). Temperature (Mean).*

— TRANSPARENT : [14587] Russell. 1902.

ATOMIC DISINTEGRATION : [14972] Soddy. 1909.

— TABLES : [14467] Rose. 1850.

— THEORIES : [4332] Sennart. 1664. [4407]  
Simpson. 1675. [4941] Trouessart. 1854-  
[4971] Tyndall. 1874. [7821] Fechner. 1864.  
[9271-2] Higgins. 1814. [11804] Meusel. 1902-  
[11818] Meyer. 1895. [12253] Muir. 1894-  
[12305] Murray. 1901. [13187] Petty. 1674.  
[13578] Power. 1664. [13756] Puschl. 1869-  
[14181 14185 14191] Richards. 1901-11-  
[14802-3] Sedgwick. 1882-96. [14814-16]  
Sendivogius. 1639-82. [14819] Sennert. 1637.  
[15110] Stoney. 1891. [15257] Thomson  
(J. J.). 1904. [15269] Thomson (T.). 1825.  
[15611] Wollaston. 1814. [S 360] Masson.  
1884. [S 1730-1] Boscovich. 1759-63

- ATOMIC THEORIES, *continued*:  
 [S 2668-70] Boyle. 1661-80. [SS 1664] Euler. 1746. [SS 2627] Swedenborg. 1847.  
 — *v. Corpuscular Theory. Matter, Theories of. Prout's Hypothesis. Vortex Theory.*  
 — THEORY (DALTON'S): [613] Brown. 1858. [933-4] Dalton. 1808-27. [954] Daubeny. 1831. [1917] Higgins. 1814. [4078] Roscoe and Harden. 1896. [4835] Thomson. 1813-18. [4840] Thomson. 1807. [5533-5] Wurtz. 1879-92. [7153-5] Dalton. 1808-27. [11733] Meldrum. 1911. [11887] Mills. 1871. [14452] Roscoe and Harden. 1896. [15265-7. 15279] Thomson. 1807-26.  
 — *v. Avogadro's Law. Chemical Combinations. Chemical Equivalents.*  
 — WEIGHTS: [809] Clarke. 1897. [1933] Hinrichs. 1901. [4568] Stas. 1894. [6190] Berzelius. 1835. [9714] Jacquerod et Bogdan. 1905. [9838] Jones. 1905. [10038] Keiser. 1888. [10286-7] Köthner. 1903-4. [11317. 11319-20] Mallet. 1856-92. [11404] Marchand and Scheerer. 1850. [11811] Meyer (J.). 1903. [11812-14] Meyer (L. J.). 1872-88. [13371-3] Plaats. 1885-93. [13427] Playfair. 1860. [13870] Ramsay. 1881. [14187. 14190-4. 14197. 14201. 14203. 14211. 14213] Richards. 1891-1910. [15020-1] Stas. 1860-94. [15119] Stoney. 1902. [15281. 15287] Thorpe. 1908-10. [15476-7] Watts. 1903-4. [S 2609] Atomic Weights. 1891-1908. [S 2682] Brauner. 1908. [S 2686] Clarke. 1882. [S 2689] Crookes. 1874. [SS 2626] Stas. 1865.  
 — *v. Chemical Proportions. Molecular W. Periodic Law. Prout's Hypothesis.*  
 ATOMS, COMBINING POWER OF: [9370. 9373] Hofmann. 1865-6.  
 —, MOVEMENT OF: [1771] Hansemann. 1871.  
 ATTRACTION, THEORY OF: [131] Appell. 1892. [524] Boyle. 1674. [1137] Earnshaw. 1844. [2188] Jordan. 1866-7. [3342] Nobili. 1818. [3750] Pratt. 1871. [6429] Boyle. 1674. [8379] Gherardi. 1841. [8908] Hargreave. 1841. [9895] Jones. 1762. [9906] Jordan. 1867. [10070] Kelvin. 1844. [10500-1] Laplace. 1813. [12702] Nobili. 1818. [13602] Pratt. 1871. [14544] Rowning. 1767. [14808] Seguin. 1861. [16934] Appell. 1892. [17017] Earnshaw. 1844. [S 581] Chasles. 1845. [SS 1701] Gerdil. 1754. [SS 1892] Michel. 1802.  
 — *v. Electric A. Gravitation. Magnetic A.*  
 —, HISTORY OF THE: [4884-5] Todhunter. 1873.  
 — OF ELLIPSOIDS: [2710] Lubbock. 1831. [5731] Allman. 1853. [6996] Collins. 1854. [11055] Lubbock. 1835. [S 579-80] Chasles. 1838-46.  
 — OF MOUNTAINS: [2124] James. 1856. [2880-1] Maskelyne. 1776. [3783] Pringle. 1775.  
 — OF VESSELS: [8048] Foster. 1824.  
 ATTRACTIVE POWERS, RESOLUTION OF: [5230] Waring. 1789.  
 ATWOOD'S MACHINE: [180. 5869-70] Atwood. 1784.  
 AURORA BOREALIS: [570] Bravais. 1847. [930-2] Dalton. 1793-1834. [2782] Mairan. 1754. [3677] Pointer. 1738. [4493] Snow. 1842. [4667] Sturgeon. 1848. [4940] Tromholt. 1882. [6799] Cavendish. 1790. [7148-52] Dalton. 1793-1834. [8445] Glaisher. 1870. [8619] Greely. 1881. [8848] Hamilton. 1872. [8907] Hare. 1836. [9577] Hutchinson. 1787. [10540] La Rive. 1862. [11307-8] Mairan. 1733-54. [12077] Morgan. 1847. [13027] Paulsen. 1894. [13335] Pigott. 1789. [14533-4] Rowell. 1840-87. [S 1621] Tromholt. 1902. [S 2542] Lemström. 1886. [SS 1289] Schickhard. 1631.  
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 AVOGADRO'S LAW: [S 2611] Avogadro. 1837-41.  
 BACTERIAL DECOMPOSITION: [7536] Emmerling. 1902.  
 BALANCE: [9496] Houten. 1827. [11069] Ludlam. 1766. [15432] Walker. 1887. [S 1739] Brauer. 1909.  
 — *v. Hydrostatic B. Torsion B.*  
 BALATA: [4790] Terry. 1907.  
 BALL-BEARINGS: [14527-9] Rowe. 1734.  
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 — *v. Galvanometer (Ballistic). Gunnery. Mathematics (Artillery).*  
 BALLOONING: [183] Augustin. 1806. [1127] Dupuis-Delcourt. 1850. [1306-10] Faujas. 1783-4. [1364] Fonvielle. 1882. [1371] Forster. 1832. [1547-50] Glaisher, etc. 1870-2. [1681] Grimaldi. 1788. [2369] La Garenne. 1852. [2729-37] Lunardi. 1784-6. [2885] Mason. 1838. [3634] Pilâtre de Rozier. 1785. [4176] Sadler. 1812. [4177] Sadler. 1817. [4918] Tournachon. 1864. [4927] Treille et Meyer. 1852. [4953] Turgan. 1851. [4961] Turnor. 1865. [5107] Vivenair. 1783. [5453] Wise. 1850. [5657] Aérostate. 1784. [5659] Aereo-Statica. 1804. [5660] Aeronautical Society of Gt. Britain. 1866-70. [5661] Aerostatics. 1802. [5662] Aerostation. 1808. [5663] Aerostation Displayed. c. 1802. [5912] Bacon. 1907. [5952] Baldwin. 1786. [6266] Blanchard. 1785. [7227] Deminne. 1865. [7806-8] Faujas de St.-Fond. 1783-4. [8027] Fonvielle. 1877. [8448-50] Glaisher, etc. 1870-1. [9280] Hildebrandt. 1908. [11089-92] Lunardi. 1784-6. [11428-9] Marion. 1867-70. [11584] Mathieu. 1799. [12327] Muzzi. 1839. [13343] Pilâtre de Rozier. 1786. [13501] Poole. 1838. [13548] Potain. 1824. [15311] Tissandier. 1878. [15353] Turnor. 1865. [S 3732] Coxwell. 1889. [S 3837-8] Zambecari. 1803. [SS 3184] Para du Phanjas. 1786. [SS 3197] Serrati. 1787.  
 — *v. Aerial Navigation. Aerostation.*  
 BARIUM AND ITS COMPOUNDS: [970] Davy. 1808. [13364] Pisani. 1876. [14189. 14210] Richards. 1893-4. [14707] Scheerer und Drechsel. 1873.  
 BAROMETER (ANEROID): [7234] Dent. 1852. [14013] Reinherz. 1887.  
 BAROMETRICAL TABLES: [SS 2354] Schlögl. 1787.

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- *v. Hypsometry. Sun's Influence on Air.*
- **PARADOXES ON:** [8801] Hale. 1675. [13769] Purshall. 1707. [14505] Roubais du Tourcoin. 1721.
- BAROSCOPE:** [5133-4] Vossius. 1663. [7016] Cooper. 1839. [15161-3] Sturm. 1676-85.
- BASALT:** [3902] Raspe. 1776. [6094] Beddoes. 1791. [7809] Faujas de St.-Fond. 1784. [13917-18] Raspe. 1776. [SS 2226] Aubuisson de Voisin. 1814.
- *v. Greenstone.*
- BATHOMETER:** [14848] Siemens. 1876.
- BATTERY, MATHEMATICAL THEORY OF:** [9107] Helbing. 1897.
- *v. Ornament, Geometrical Law of.*
- BECQUEREL RAYS:** [11407] Marekwald. 1904. [15146] Strutt. 1904.
- BEECH OIL:** [1920] Hill. 1715.
- BELEMNITE:** [6384] Bourguet. 1762.
- BELL-RINGING:** [15539] White. 1677.
- BELLS:** [1682] Grimthorpe. 1860. [8949] Harrison. 1831.
- BELTING:** [7015] Cooper. 1883. [9482] Hospitalier, *v. y.*
- BEN OIL, CHEMISTRY OF:** [3142. 12247] Mulder. 1847.
- BENZENE (BENZOL) AND ITS DERIVATIVES:** [1288. 7769. 7784] Faraday. 1825-59. [9379] Hofmann. 1845. [9712] Jacobson and Hönigsberger. 1903. [11359] Mansfield. 1849. [11951-3] Mitcherlich. 1834-47.
- *v. Aniline. Camphors. Indigo. Mesitylene. Phenol. Picric Acid. Retene. Terpenes. Toluene.*
- BENZOIC ACID AND BENZOATES:** [5067] Vignère. 1618. [13506] Pope. 1895. [13776] Pyman. 1904. [14697] Scheele. 1786. [15396] Vignère. 1642.
- BESSEMER PROCESS:** [383] Bessemer. 1905. [1748] Hall. 1857.
- *v. Blast Furnace.*
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- *v. Arithmetical Triangle. Series (Infinite).*
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 — *v. Evolution, Mathematical Theory of.*
- BIRDFLIGHT, THEORY OF:** [10046] Keller. 1911.
- BISMUTH:** [6738] Carnot. 1878. [7776] Faraday. 1849. [13057] Pearson. 1856. [13550] Pott. 1753.
- BITUMEN:** [9008] Hatchett. 1804. [10244] Knox. 1823.  
 — *v. Asphalt.*
- BLAST FURNACE:** [1694] Gruner. 1873. [10120] Kerpely. 1884. [14721] Schinz. 1870.
- BLASTING:** [4155] Rziha. 1866. [5764] André. 1878. [8761] Guttman. 1892. [S 3219] Drinker. 1878.
- BLEACHING:** [363] Berthollet. 1841. [3396] O'Reilly. 1804. [4290] Schützenberger. 1882. [5334] Westrumb. 1819. [5610] Abel. 1905. [6162. 6164] Berthollet. 1791-1841. [9270] Higgins. 1799. [9418] Home. 1756. [12920-1] Pajot des Charmes. 1798-1800. [14611] Ryan. 1852. [15044] Stephenson. 1808. [S 3060] Hübner. 1912. [SS 2719] Berthollet. 1824. [SS 2817] Partridge. 1823.
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 — *v. Globulin.*
- BLOWPIPE ANALYSIS:** [3119] Moses and Parsons. 1895. [3652-5] Plattner. 1845-75. [4090] Ross. 1884. [6185-7] Berzelius. 1822-45. [6606]

BLOWPIPE ANALYSIS, *continued*:

- Bunsen. 1886. [7088] Cronstedt. 1788. [10342] Kupferschlaeger. 1860. [13402-6] Plattner. 1845-75. [14487] Ross. 1880. [14705] Scheerer. 1851. [S 2641] Berzelius. 1821-37.  
 — *v. Oxhydrogen Blowpipe.*
- BOILER DEPOSITS:** [13251] Phipson. 1868.  
 — EXPLOSIONS: [839] Colburn. 1860. [7320] Dodd. 1818. [8973] Hartig. 1867. [11457-8] Marten. 1869-72. [13124] Perkins. c. 1840.  
 — TESTING: [13126] Perkins. 1881.
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 — *v. Injectors. Valve.*
- BOILING POINT:** [11408] Marckwald. 1888. [13453] Pohl. 1850. [14753] Schröder. 1844. [15367] Urriola. 1908. [15464-6] Watson. 1791-1800.
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 — *v. Gunnery and Artillery. Pyrotechnics.*
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- BORING AND DRILLING:** [2895] Mather. 1864. [4786] Tecklenburg. 1886-96. [8997] Haskoll. 1846. [11188] McGuire. 1896. [S 3219] Drinker. 1878.
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- BOYLE-MARIOTTE'S LAW**—*v. Gases, Laws of.*
- BRACHISTOCURVE:** [353] Bernoulli. 1742. [1873] Hermann. 1716. [6151-2] Bernoulli. 1742. [9171] Hermann. 1716.  
 — *v. Curves (Isoperimetrical).*
- BRASS, METALLURGY OF:** [3539] Percy. 1861. [10545] Larkin. 1887. [13111] Percy. 1861.
- BREADMAKING:** [2114] Jago. 1886. [7336] Donovan. 1830. [7447] Edlin. 1805. [14411] Rollet. 1846. [SS 2708] Accum. 1821.  
 — *v. Cereals, Chemistry of.*
- BREWING:** [27] Accum. 1821. [225] Bailey. 1889. [294] Baverstock. 1826. [427-8] Black. 1844-75. [562] Brande. c. 1825. [569] Braungart. 1901. [780-1] Child. 1797. [854-5] Combrune. 1762-1804. [1369] Ford. 1862. [1983] Hooper. 1882. [2575-6] Levesque. 1845-53. [3107] Moritz and Morris. 1893. [3528] Peltz und Habich. 1876. [3645] Pitt. 1859. [3741] Practical Brewing. 1879. [3996] Richardson. 1805. [4361] Shannon. 1805. [4572] Steel. 1881. [4836] Thomson. 1849. [4864] Tizard. 1845-6. [4948] Tuck. 1822. [5636] Accum. 1820. [6250] Black. 1835. [6469] Brewer (Compleat). 1760. [6470] Brewer (London and Country). 1737-8. [6471] Brewer's Monitor. 1824. [7336] Donovan. 1830. [8780] Hagecius. 1585. [8846-7] Ham. 1822-3. [9061] Hayman. 1819. [9433] Hooper. 1882. [10302] Krebs. 1887. [10777] Levesque. 1847. [11042] Lovibond. 1883. [11334] Malt-Liquors. c. 1740. [11725] Meibom. 1668. [12150] Moritz and Morris. 1891. [12165-7] Morrice. 1819-34. [13392-3] Plat. 1653. [13934] Rawlinson. 1807. [13979] Reddington. 1780. [14220] Richardson. 1777. [14318-19]

## BREWING, continued:

- Roberts. 1837-47. [14432] Ronna. 1869. [15270] Thomson. 1849. [SS 2723. 2725-7] Brewer (London and Country). 1735-50. [SS 2730] Combrune. 1758.  
— *v. Malting. Saccharometer.*  
—, BACTERIOLOGY OF: [3487-8. 13007-9] Pasteur. 1876-9.  
— *v. Fermentation.*  
—, CHEMISTRY OF: [S 3150] Windisch. 1895.

## BRICK MAKING: [7316] Dobson. 1850. [13082] Pérouze. 1828.

- BRIDGE BUILDING: [100] Anderson. 1818. [630] Buck. 1857. [1084-5] Douglas. 1816-32. [1492] Gauthey. 1809-16. [1812] Haupt. 1864. [2021] Humber. 1870. [2141] Jenkin. 1876. [2389] Laisse at Schuebler. 1871. [2833] Marquand. 1749. [2897] Matheson. 1873. [2921] Maw and Dredge. 1872. [2952] Merrill. 1870. [4325] Temple. 1776. [4429-30] Smeaton. 1812-14. [6587-8] Buck. 1839-80. [7229] Dempsey. 1850-6. [7741-4] Fairbairn. 1849-70. [8181-2] Fulton. 1796. [9028] Haupt. 1862-73. [9065] Sleaford. 1883. [9350] Hodges. 1860. [9536] Hughes. c. 1852. [9550-1] Humber. 1861-70. [9615] Hutton. 1891. [9790] Jenkin. 1876. [10125] Ketchum. 1908. [10561-2] Latham. 1858. [11445] Marquand. 1749. [11578] Matheson. 1873. [11696] Maynard. 1868. [11771] Merrill. 1870. [11776] Merriman and Jacoby. 1894-7. [12062] Morandière. 1874-82. [12403] Navier. 1823. [13140-1] Perronet. 1788-94. [13318] Pictet. 1823. [13503] Pope. 1811. [13730] Prony. 1832. [14064-5] Rennie (J.). 1736-1823. [14276] Ritter. 1879. [14425] Rondelet. 1836. [14792] Seaward. 1824. [14806-7] Seguin. 1824-6. [14927-30] Smeaton. 1767-1814. [15142] Struckel. 1906. [15342] Turnbull. 1841. [15387] Veranzio. c. 1955. [15426] Waddell. 1884.

— *v. Arches. Caissons. Chains (Suspension). Girders. Joints (Riveted). Roofs. Trusses. Viaducts.*

- PIERS: [12488] Newman. 1893.  
— RIBS: [8076] Fox. 1849. [10937] Locke. 1849.  
BRIDGES, THEORY OF: [2048. 9606. 9610-11] Hutton. 1772-1812.

## BROCARD'S FIGURES: [15973] Emmerich. 1891.

- BROMINE AND ITS COMPOUNDS: [250] Balard. 1826. [14179. 14209] Richards. 1890-7.  
— PROCESS: [6853] Chevalier. 1841.

## BUBBLE FORMATION: [13813] Quince. 1894.

- BUILDERS' GUIDES: [639] Builder. 1734. [1006] Dempsey. 1857. [3314] Nicholson. 1845. [4195] Salmon. 1752. [6400] Boyers. 1807. [6601] Builder's Practical Director. 1856-8. [6628] Burn. 1870. [7191-3] Davy. 1839-41. [12643-4] Nicholson. 1812-45. [12985] Partington. 1825.

- BUILDING CONSTRUCTION: [87] Allen. 1900. [264] Barberot. 1906. [640] Building. 1883. [3688] Pole. 1872. [4312] Scott-Moncrieff. 1897. [4377] Shields. 1877. [5510-11] Wray. 1872-80. [6021] Bartholomew. 1840. [6495] Brightmore. 1908. [6602-3] Building Construction. 1875-85. [6605] Bulloch. 1854. [6640] Burrell. 1895. [6641] Burri. 1873. [6810] Chabat. 1881. [7317] Dobson. 1856. [7742-4] Fairbairn. 1857-70. [8077] Fox. 1881. [8174] Fryer. 1876. [10227] Knight. 1889. [11441] Marks. 1901. [11551] Masonry. 1847. [13935] Rawlinson. 1858. [14427] Rondelet. 1842-3. [15143] Strukel. 1906. [17344] Hochbaukunde. 1899-1905. [S 3340] Andrews. 1913. [S 3376-7] Building Construction. 1879-1908. [S 3491] Innocent. 1916.

## BUILDING CONSTRUCTION, continued:

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— ESTIMATES: [176] Atchley. 1868. [13185] Pawtner. 1870. [S 3585] Rea. 1913.  
— *v. Engineering Costs. Quantity Surveying.*  
— LAW: [5974] Fletcher. 1896.  
— MATERIALS: [5621] Abney. 1876. [9544] Hull. 1872. [12281] Munby. 1909. [13003] Pasley. 1838. [13345] Pincot. 1770.  
— *v. Brick Making. Cement. Concrete. Granite. Mortar. Timber. Wood.*  
BUTYRIC ACID: [13272] Phipson. *n.d.* [14274] Ritsert. 1890.  
CABLE TESTING: [5942] Baines. 1903.  
— TRANSPORT: [2326] Kool en Siedenburgh. 1871.  
— *v. Tramways (Wire). Wire Rope.*  
CABLES (CHAIN): [6069] Beardslee. 1879. [6560] Brunton, etc. 1814-15. [13106] Pering. 1819.  
— (SUBMARINE): [13609] Preece. 1862.  
CADMIUM AND ITS COMPOUNDS: [9662] Ingalls. 1903. [10478] Lang et Rigaut. 1899. [14202. 14206] Richards. 1898-1906. [S 3255] Ingalls. 1906.  
CAESIUM: [13358] Pisani. 1864.  
CAFFEINE: [12648] Nicholson. 1847. [14582] Runge. 1820.  
CAISSONS: [7218-19] Deeble. 1827-8.  
CALCIUM: [970] Davy. 1808. [12794] Odling. 1859. [14187. 14203] Richards. 1902-10.  
— CARBIDE: [13319] Pictet. 1896.  
— *v. Acetylene.*  
— MONOXIDE: [6248] Black. 1777. [6928] Classen. 1733. [7444] Edinburgh Essays. 1754-71. [9459] Hornby. 1821. [15620] Edinburgh Essays. 1803.  
— PHOSPHIDE: [3509] Pearson. 1792.  
CALCULATING MACHINES AND DEVICES: [190-1. 198] Babbage. 1864-89. [2395] Lalanne. 1840. [3188] Napier. 1617. [3692] Poleni. 1709. [3973] Reuleaux. 1862. [4809] Thomas. 1865. [5891. 5896] Babbage. 1843-64. [7321] Dodd. 1853. [12155-6] Morland. 1673. [12339-42] Napier. 1617-22. [12768] Nystrom. 1852. [SS 871] Suardi. 1752.  
— *v. Abacus. Counters. Napier's Bones. Scale (Mathematical). Slide Rule.*  
CALCULATION, PRINCIPLES OF: [752] Challis. 1869. [7543] Emerson. 1770. [12084. 12087] Morgan. 1843-9. [15860] Challis. 1869. [16334] Lürth. 1900.  
CALCULUS: PHILOSOPHICAL PRINCIPLES OF THE: [347-8] Berkeley. 1734-5. [700] Carnot. 1839. [1367] Forbes. 1837. [1822] Hawkes. 1822. [2207-8] Jurin. 1734-5. [2604] L'Huilier. 1787. [3378] Ohm. 1843. [3442] Paman. 1744. [3560] Petvin. 1750. [4041-2] Robins. 1735-40. [4344] Serret. 1855. [4913] Torelli. 1758. [5196-7] Walton. 1735. [5486-7] Woodhouse. 1803. [6056] Bays. 1736. [6144-5] Berkeley. 1734-54. [6741-2] Carnot. 1801-39. [6972] Coddington. 1825. [8028] Forbes. 1837. [9344] Hobson. 1902. [9963] Jurin. 1734. [12684] Nieuwentyt. 1695. [14134] Reynau. 1708. [14345] Robins. 1761. [14672-3] Saunderson. 1756. [14761] Schwarz. 1853. [15838] Carnot. 1860. [15999] Fleury. 1899. [16048] Genocchi. 1899. [16260] Lamarle. 1861-3. [16807] Young. 1910.  
— *v. Continuity. Infinity. Limits. Method of. Maclaurin's Theorem.*



CALCULUS : NEWTON-LEIBNIZ CONTROVERSY ON ITS INVENTION: [2532] Leibniz. 1745. [3282] Commercium. 1712. [3298] Recueil. 1720. [3900] Raphson. 1715. [4690] Suzzi. 1723. [4757] Taylor. 1793. [5040] Varignon. 1725. [5183] Wallis. 1693-9. [10696. 10699-701. 10703] Leibniz. 1720-1884. [12117] Morgan. 1851. [12534-6] Newton. 1704. [12564-71] Commercium Epistolicum. 1712-1856. [12613] Newton et Leibniz. 1863. [12616] Morgan. 1846. [13846] Raphson. 1715. [15208] Taylor. 1793. [S 922] Sloman. 1860.

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— *v. Curves, Quadrature of. Exhaustion, Method of. Indivisibles, Method of. Interpolation. Maxima and Minima. Tangents (Geometrical).*

— : FLUXIONAL AND DIFFERENTIAL NOTATIONS COMPARED : [3498] Peacock. 1819. [3574] Philoleutherus Londinensis. 1744. [5486-7] Woodhouse. 1803. [9245] Herschel and Babbage. 1813. [13036] Peacock. 1819.

— ('ANTECEDENTAL') : [8478] Glenie. 1793.

— (BARYCENTRIC) : [16397-8] Möbius. 1827-85.

— (DIFFERENTIAL) : [298] Bazaine. 1817. [856] Byerly. 1880. [1150] Edwards. 1893. [1251] Euler. 1787. [1822] Hawkes. 1823. [2487] Laurent. 1885. [2765] McMahon and Snyder. 1898. [3359] O'Brien. 1842. [3410] Otley. 1837. [3768] Price. 1848. [3991] Rice and Johnson. 1880. [4900-3] Todhunter. 1871-90. [5205-7] Walton. 1845-6. [5427-8] Williamson. 1877-89. [5503] Woolhouse. 1845. [5558] Young. 1836. [6181] Bertrand. 1864. [6448] Brahy. 1867. [6545] Browne. 1824. [7462-4] Edwards. 1886-93. [7686] Euler. 1755. [9293] Hind. 1831. [10696] Leibniz. 1884. [10792-3] L'Hospital. 1716. [11878] Miller. 1833. [14134] Reynau. 1708. [14160-1] Rice and Johnson. 1888. [15782-4] Brahy. 1867-1905. [15825] Byerly. 1901. [15966] Edwards. 1909. [16048] Genocchi. 1899. [16225] Kleyer and Haas. 1888-94. [16313] Lodge. 1902. [16732-3] Todhunter. 1873-1907. [16793] Williamson. 1899. [16801] Woolhouse. 1874. [SS 346] Crousz. 1721.

— *v. Differential.*

— (FLUXIONAL) : [876] Cotes. 1722. [983] Dealtry. 1816. [1066] Ditton. 1726. [1827] Hayes. 1704. [2148] Jephson. 1826-30. [2425-6] Landen. 1780-9. [2761-3] Maclaurin. 1742. [2939] Meerman. 1742. [3028] Moivre. 1704. [3234-5. 3246. 3249-50] Newton. 1704-36. [3900] Raphson. 1715. [4110-12] Rowe. 1751-1809. [4115] Rowning. 1756. [4202] Saunderson. 1756. [4395-6] Simpson. 1750-1805. [4621-2] Stone. 1730-5. [5086-7] Vince. 1805-12. [5670-1] Agnesi. 1801. [6056] Bayes. 1736. [6545] Browne. 1824. [7038-9] Cotes. 1722. [7211] Dealtry. 1816. [7304] Ditton. 1726. [7548-9] Emerson. 1743-57. [8808-9] Hales. 1800. [9060] Hayes. 1704. [9354-5] Hodgson. 1736-58. [9404] Holliday. 1777. [10460] Landen. 1780. [11147-8] Lyons. 1758. [11231-5] Maclaurin. 1741-1801. [11489. 11493] Martin. 1739-59. [11615-16] Mauduit. 1768. [12269] Muller. 1736. [12506. 12534-6. 12572-3. 12579-83. 12588] Newton. 1704-45. [14531] Rowe. 1757. [14672-3. 14676] Saunderson. 1742-56. [14872] Simpson. 1750. [S 1041] Newton. 1737.

CALCULUS (GEOMETRICAL) : [16247] Kraft. 1893. [16473] Peano. 1891. [16613] Schubert. 1879.

— (GRAPHIC) : [265] Barker. 1902. [15900] Cremona. 1875. [16453] Ocagne. 1908. [17163] Ott. 1879-85.

— *v. Statics (Graphic).*

— (INFINITESIMAL) : [726] Cauchy. 1840-4. [910] Crousz. 1721. [1052] Differential and Integral Calculus. 1837-43. [1360-1] Fontenelle. 1727. [1644-5] Greenhill. 1891-6. [2007] Hoüel. 1878-81. [2357-8] Lacroix. 1810-19. [2598-9] L'Hospital. 1716-68. [3079] Morgan. 1842. [3197] Navier. 1848-9. [3769-72] Price. 1852-62. [3980] Reynau. 1708. [4338] Serret. 1879-80. [6180] Bertrand. 1864-70. [6776] Cauchy. 1840-4. [7112] Crousz. 1721. [7220] Deidier. 1740. [7992] Fontaine. 1770. [8021-2] Fontenelle. 1727. [8028] Forbes. 1837. [8820-2] Hall. 1837-63. [10380-1] Lacroix. 1810. [12096-8] Morgan. 1842. [13642-6] Price. 1852-89. [13818] Raabe. 1839-47. [14824] Serret. 1906-9. [15733-4] Bertrand. 1864-70. [15775] Boussinesq. 1887-90. [15845] Carr. 1886. [15855] Cauchy et Moigno. 1840-4. [15856] Caunt. 1914. [15898] Crefœeur. 1902-8. [15907-8] Czuber. 1898-1906. [16053] Gilbert. 1894. [16089] Haag. 1893. [16163] Hoüel. 1878-81. [16207] Kiepert. 1901-3. [16275-6] La Vallée-Poussin. 1903-12. [16306] Lipschitz. 1877-80. [16320] Lorentz. 1907. [16380-1] Meyer. 1901-15. [16405] Morgan. 1842. [16421] Navier. 1875. [16500-1] Price. 1857-89. [16638-9] Serret. 1886-1909. [16685-7] Stolz. 1893-9. [SS 2358-60] Stancari. 1713.

— *v. Analysis (Mathematical). Mathematics (Higher).*

—, ELEMENTARY WORKS ON THE : [390] Bézout. 1824. [488-90] Boucharlat. 1826-81. [1109] Duhamel. 1860-1. [1138] Echols. 1902. [1342] Fisher. 1881. [1749-50] Hall. 1834-46. [1785-6] Harnack. 1881-91. [1862-3] Hemming. 1848-52. [1927] Hind. 1831. [1993] Hopkins. 1833. [2359-62] Lacroix. 1816-74. [2397] Lamb. 1897. [2453] Lardner. 1825. [2692] Loomis. 1874. [2985] Miller (T. H.). 1891. [2991-2] Miller (W. H.). 1833-43. [3312] Nichols. 1900. [3481] Pasch. 1882. [3495] Pauly. 1887. [4019] Ritchie. 1847. [4756] Tattershall. 1838. [4768] Taylor (F. G.). 1899. [4770] Taylor (J. M.). 1884. [4825-6] Thomson. 1831-56. [5554] Young and Lineberger. 1900. [7050-2] Cournot. 1841-57. [7293] Dienger. 1857. [7387] Duhamel. 1856. [8388-9] Gibson. 1901-4. [5584] Granville. 1904. [8635-6] Greenhill. 1886-91. [9128] Hemming. 1852. [10373. 10375-8] Lacroix. 1816-74. [10519-20] Lardner. 1825. [10780-2] Levy. 1830. [13574] Powell. 1829. [15696] Antenneimer. 1901-10. [15773] Boucharlat. 1891. [15780] Bowser. 1905. [15819] Burkhardt. 1907. [15825-6] Byerly. 1889-1901. [15829] Cain. 1909. [15858] Cesàro. 1904. [15950] Duhamel. 1860-1. [16018-19] Fricke. 1902-9. [16050. 16052] Gibson. 1904-10. [16075] Greenhill. 1896. [16109] Harnack. 1891. [16236] Kohlrausch. 1907. [16252] Lacroix. 1867. [16261] Lamb. 1907. [16330] Lübsen. 1899. [16472] Pauly. 1909. [16520] Rice and Johnson. 1888. [16593] Schlotke. 1903. [S 1208] Spitz. 1871.

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- CALCULUS: APPLICATION AND EXAMPLES, continued:** [16028-9] Fuhrmann. 1890-1903. [16071] Graindorge. 1885. [16076-7] Gregory. 1846. [16300] Lieblein. 1889. [16656-8] Sohncke. 1885-1908. [16725] Tisserand. 1896.
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- (INTEGRAL): [657] Byerly. 1881. [704] Carré. 1700. [779] Cheyne. 1703. [859] Condorcet. 1765. [876] Cotes. 1722. [1252-3] Euler. 1768-1845. [2074-5] Hymers. 1835-44. [2095] Integral Calculus. 1835. [2169] Johnson. 1883. [2524] Legendre. 1811-17. [3413] Ottley. 1838. [4622] Stone. 1735. [4904-7] Todhunter. 1868-95. [4917] Tortolini. 1844-6. [5179-80] Walmsley. 1749-53. [5429-30] Williamson. 1880-91. [5559] Young. 1831. [7038-9] Cotes. 1722. [7465] Edwards. 1894. [7687] Euler. 1824-45. [8904] Hardy. 1905. [10736] Le Seur. 1748. [10912] Lobatto. 1851-2. [14156-7] Riccati. 1757-62. [14291] Roberts. 1887. [14880] Simpson. 1743. [15001] Spottiswoode. *n. d.* [15097] Stone. 1735. [15783-4] Brahya. 1895-1905. [15826] Byerly. 1889. [16071] Graindorge. 1885. [16227-8] Kleyer und Haas. 1889. [16532] Roberts. 1887. [16734-5] Todhunter. 1874-95. [16793-4] Williamson. 1906. [S 497] Bougainville. 1754-6. [S 1081] Pfaff. 1797.
- *v. Integration. Pfaff's Problem.*
- OF DERIVATIONS: [S 443] Arbogast. 1800.
- OF FINITE DIFFERENCES: [468-70] Boole. 1860-72. [1170] Emerson. 1763. [1251] Euler. 1787. [1336] Finite Differences. 1849. [1883-4] Herschel. 1820. [2072-3] Hymers. 1839-58. [2334] Kuhff. 1831. [2374. 2381] Lagrange. 1806-13. [3317] Nicholson. 1817. [3511] Pearson. 1849. [4762] Taylor. 1715. [6331-3] Boole. 1860-72. [6626] Burn and Brown. 1902. [6733] Carmichael. 1860. [7555-6] Emerson. 1763. [7686] Euler. 1755. [8819] Hall. c. 1819. [9214-15] Herschel. 1820. [9642-3] Hymers. 1839-58. [12815] Ohm. 1851. [13050-2] Pearson. 1849-50. [15763] Boole. 1872. [15820] Burn and Brown. 1902. [16359] Markoff. 1896. [16635] Selivanov. 1904. [SS 880-1] Taylor. 1717.
- *v. Differential Method. Series (Infinite).*
- OF FUNCTIONS: [194] Babbage. 1820. [5890] Babbage. 1820. [9233] Herschel. 1820. [12093-4] Morgan. 1836.
- *v. Functions, Theory of. Taylor's Theorem.*
- OF OPERATIONS: [6734-6] Carmichael. 1853-5. [12347] Naquet. 1879.
- *v. Calculus of Derivations.*
- OF VARIATIONS: [695-6] Carll. 1881-5. [1256] Euler. 1741. [1750] Hall. 1846. [2139] Jellett. 1850. [2605-6] L'Huilier. 1789. [4895] Todhunter. 1871. [5491] Woodhouse. 1810. [6774] Cauchy. 1821. [8819. 8821] Hall. 1819-46. [9708] Jacobi. 1866. [9778] Jellett. 1850. [10859] Lindelöf. 1861. [13642-6] Price. 1852-89. [14884-5] Simpson. 1757. [15757] Bolza. 1909. [15837] Carll. 1881. [16232] Kneser. 1900. [16471] Pascal. 1899. [16793] Williamson. 1906. [SS 69] Gauss. 1870-1906.
- *v. Curves (Isoperimetrical).*
- HISTORY OF THE: [4888-90] Todhunter. 1861.
- CALENDAR:** [1965] Holder. 1694. [1999] Horrocks. 1678. [8692] Griffith. 1892. [8742] Gumpach. 1848. [8839] Halliwell-Phillipps. 1839. [9455] Hopton. 1616. [12101] Morgan. 1844. [14284] Rivard. 1804. [14997] Spinola. 1562. [15138] Streete. 1667. [SS 1329] Vetter. 1759.
- *v. Almanacs. Chronology. Easter. Ephemerides. Time.*
- REFORMS: [818] Clavius. 1603. [1076] Doglioni. 1587. [2214] Calendarium Gregorianum. 1582. [3629] Piccolomini. 1568. [3642] Pitatus. 1568. [6943] Clavius. 1612. [12880] Padovani. 1576. [13299] Piccolomini. 1568. [SS 1025] Calvisius. 1616. [SS 1044] Clavius. 1595. [SS 1110] Gallucci. 1589. [SS 1188] Martelli. 1583.
- CALICO PRINTING:** [904] Crookes. 1874. [3358] O'Brien. 1789. [4290] Schützenberger. 1882. [7094] Crookes. 1882. [10760] Leuchs. 1828. [12973] Parnell. 1849. [S 3018] Crace-Calvert. 1878.
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- *v. Pyrometry.*
- CALOTYPE:** [4687] Sutton. 1855. [9570] Hunt. 1851. [10729] Lerebours. 1843. [14540] Rowland. 1855.
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- CAMERA LUCIDA:** [SS 2739-40] Chevalier. 1829.
- **OBSCURA:** [3711-12] Porta. 1585-1644. [6451] Brander. 1767. [13517-19] Porta. 1558-89. [15161-3] Sturm. 1676-85. [S 2437-8] Zahn. 1685-1702. [SS 1658-9] Euclide. 1573. [SS 1861-2] Magini. 1611-28. [SS 2186-7] Adams. 1771. [SS 2739-40] Chevalier. 1829.
- CAMPHORS:** [4492] Société Chimique. 1889-92. [8037-8] Forster. 1897-1903. [10153. 10156] Kipping. 1895-6. [15440] Wallach. 1909.
- CANAL ENGINEERING AND NAVIGATION:** [4646] Strootman. 1858. [4741] Tanner. 1840. [5059] Vernon-Harcourt. 1882. [6778] Cautley. 1862. [7753] Fairbairn. 1831. [8033] Forfait. 1777. [8181-2] Fulton. 1796. [9391] Hogrewe. 1780. [9799] Jessop and Milne. 1791. [10273] Konijnenburg. 1905. [10647] Lecchi. 1773. [10709] Ley. 1884. [10873] Linguet. 1769. [13140] Perronet. 1788. [13209] Phillips. 1792-4. [14041. 14048. 14050-6. 14059-61. 14067] Rennie (J.). 1770-1816. [14072] Rennie (Sir J.). 1842. [14264] Riquet. 1805. [14912. 14927-31] Smeaton. 1767-1814. [15057-8] Stevenson (D.). 1858-72. [15069] Stevenson (R.). 1817. [15170-1] Sutcliffe. 1797-1816. [15206] Tatham. 1799. [S 3582] Raccolta (Nuova). 1823. [SS 3002] Frisi. 1818. [SS 3064] Raccolta. 1821.
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- *v. Surface Tension.*
- PARADOXES: [SS 2016] Rabiqueau. 1753.
- CAPILLARY ANALYSIS: [8522] Goppelsroeder. 1901.
- TUBES: [12322] Musschenbroek. 1752. [13470] Poiseuille. 1842. [SS 1701] Gerdil. 1754. [SS 1906-7] Musschenbroek. 1729.
- — — — — CHEMICAL EFFECT OF: [S 2691] Becquerel. 1867-72.
- CAPORCIANITE: [5760] Anderson. 1842.
- CARBOLIC ACID—*v. Phenol.*
- CARBON COMPOUNDS, DICTIONARY OF: [3997. 14231] Richter. 1900-5.
- DIOXIDE: [318] Beins. 1875. [3509] Pearson. 1792. [3790-1] Priestley. 1774-7. [5277] Allen and Pepys. 1807. [10755] Letts and Blake. 1900. [SS 1792-6] Ingenhousz. 1782-9. [SS 2424] Berthollet. 1776.
- — — — — LIQUEFACTION OF: [2823] Mareska. 1845.
- — — — — ABSORBED BY PLANTS: [2084-7. 9665-6] Ingenhousz. 1779-90. [14817] Senebier. 1783.
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- CARDING: [11150] M. (J.). 1832. [15171] Sutcliffe. 1816.
- *v. Spinning.*
- CARNOT'S CYCLE: [701] Carnot. 1824. [S 2034] Kelvin. 1849.
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- \* \* \* *An extensive collection of such books will be found in Messrs. Sotheran's Bibliotheca Vaticana.*
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Porta. 1608-9. [13535] Porta Leone. 1584. [15912-3] Tachen. 1669-71. [15233] Thibaut. 1668. [15396] Vigenère. 1642. [15621-3] Brunschwylg. 1519-37. [15629] Cesi. 1638. [15630] Croll. 1669-70. [S 2681] Boyle. 1685. [SS 2450] Brendel. 1671. [SS 2566] Libavius. 1613-15.

— *v. Alchemy. Distilling.*

— (INDUSTRIAL AND TECHNICAL)—*v. Chemistry (Applied).*

— (INORGANIC): [1191] Erdmann. 1898. [1769] Handbuch. 1892-4. [2184] Jones. 1903. [2323] Kolbe. 1884. [2330] Kraft. 1891. [2977] Michaelis. 1878-89. [2990] Miller. 1876-87. [3229] Newth. 1903. [3958-60] Remsen. 1886-1901. [4000] Richter. 1895. [4779] Taylor. 1892. [4848] Thorpe. 1896. [8116] Frankland and Japp. 1884. [8370] Geubel. 1847. [9301] Hinds. 1902. [9102] Holleman. 1902. [9717] Jago. 1895. [12845] Ostwald. 1904. [14019-20] Remsen. 1886-9. [14453-60] Roscoe. 1887-1907. [14776] Scoffern. 1856. [14939] Smith. 1906. [17330] Werner. 1909. [S 2789] Inorganic Chemistry. 1914. [S 2902] Roscoe. 1911. [S 2912] Smith. 1907. [S 2920] Stewart. 1912.

— *v. Gases, C. of.*

— (MEDICAL): [9395] Holland. 1905. [9715] Jacquin. 1785. [12791-2] Odling. 1869-76. [15486] Weber. 1780.

— (MINERAL): [13858-60] Rammelsberg. 1841-75. [15632] Moissan, etc., 1904-6.

— ('MOLECULAR'): [4327] Selmi. c. 1850.

— (NEW): [1122] Duncan. 1905. [4373] Shennstone. 1906. [9374-5] Hofmann. 1865. [7007-8] Cooke. 1876-96. [7398] Duncan. 1907. [17330] Werner. 1909.

— (ORGANIC): [159] Armstrong. 1884. [316-17] Beilstein. 1886-1902. [355] Bernthsen. 1895. [359] Berthelot. 1872. [1479] Gattermann. 1896. [1509-10] Gerhardt. 1853-6. [1971] Holleman. 1903. [2253] Kekulé. 1863-83. [2626] Liebig. 1841-4. [2976] Meyer and Jacobson. 1893-1903. [2989] Miller. 1880. [3354] Noyes. 1897. [3548] Perkin. 1894-5. [3901] Raspail. 1833. [3961-2] Remsen. 1885-1906. [3998-9] Richter. 1894-1901. [4267] Schorlemmer. 1874. [4637] Strecker and Wislicenus. 1881. [6159] Berthelot. 1860. [6161] Berthelot et Jungfleisch. 1881. [6978] Cohen. 1902. [8365] Gerhardt. 1853-6. [8675] Gregory. 1852. [9403] Holleman. 1903-6. [10042-4] Kekulé. 1861-87. [10363] Lachman. 1899. [10847] Liebig. 1840-4. [11819] Meyer and Jacobson. 1893-1903. [11868] Miller. 1880. [13083] Pelouze et Fremy. 1864. [13121-2] Perkin. 1897-1902. [13823] Radcliffe and Sinnatt. 1905. [14021] Remsen. 1896. [14461-3] Roscoe and Schorlemmer. 1881-8. [15271] Thomson. 1838. [17310] Keane. 1909. [S 2688] Cohen. 1909. [S 2901] Richter. 1907. [S 2919] Stewart. 1911.

— *v. Alkyl. Allophane. Amido-Compounds and Amines. Amyl. Carbon Compounds. Cyanogen Compounds. Hydrocarbons. Nitrogenous Organic Compounds. Organic Compounds. Organic Metals. Radicals (Organic). Volatile Organic Bases.*

— (PHARMACEUTICAL): [629] Buehner. 1849. [3072] Morelot. 1809. [6052] Baumé. 1762. [8391] Giese. 1811. [9287] Hill. 1751. [11061] Ludwig. 1671. [11327] Malouin. 1754. [12070] Morelot. 1803. [12308] Murray. 1776-84. [12735] Nollet. 1787. [14773] Scapoli. 1786. [S 2699] Dunstan. 1892. [SS 2481-2] Dioscorides. 1518-98. [SS 2599] Pomet. 1748.

— *v. Drugs.*



CHEMISTRY (PHLOGISTIC): [300] Baumé. 1778. [302-3] Becher. 1719-38. [446-7] Boerhaave. 1733. [451] Bohne. 1685. [2539] Lémery. 1756. [2967] Meurdrac. 1687. [3206-7] Neumann. 1759. [3790-5] Priestley. 1774-90. [4229, 4231] Scheele. 1785-6. [4530] Speth. 1712. [4550] Stahl. 1746-7. [6050-2] Baumé. 1757-73. [6082, 6084] Becher. 1738-55. [6290-1] Boerhaave. 1732-41. [8055-6] Fourcroy. 1785. [9264] Higgins. 1786. [11073-4] Ludolf. 1752. [11248-56] Macquer. 1751-77. [11419] Marggraf. 1767-8. [11854] Millar. 1754. [12452] Neumann. 1773. [13166] Petermann. 1750. [13549] Pott. 1738. [13654-8, 13669-70] Priestley. 1772-90. [14626-7] Sage. 1773. [14697-9] Scheele. 1780-6. [14715] Scheffer. 1779. [14995-6] Spielmann. 1763-6. [15008-10] Stahl. 1723-71. [15356] Tychem. 1787. [15412-13] Vogel. 1757-75. [15445-6] Wallerius. 1766-80. [15577-8] Wilson. 1699. [S 2654-5] Boerhaave. 1727-53. [SS 2422] Baumé. 1786. [SS 2437] Boerhaave. 1735. [SS 2530] Harrington. 1804.

— *v. Phlogiston Theory.*

— (PHOTOGRAPHIC): [1777-8, 8900-2] Hardwick. 1859-83. [10608] Leaper. 1891. [11729] Meldola. 1889-1901. [14596] Russell. 1904. [14698] Scheele. 1780. [S 2792] Kühne. 1878.

— *v. Photographic Chemicals.*

— (PHYSICAL): [861] Cooke. 1886. [974-5] Davy. 1812. [1957-8] Hoff. 1899-1903. [4531] Speyers. 1897. [7006] Cooke. 1886. [8103] Frankland. 1877. [9364] Hoff. 1902. [12420] Nernst. 1896. [13176] Petterson. 1879. [15431] Walker. 1903. [15446] Wallerius. 1776-80. [17308] Hoff. 1899-1901. [17328-9] Walker. 1904-7. [S 2710] Findlay. 1914. [S 2779] Hoff. 1898-9. [S 2790] Jones. 1903. [S 2860] Morgan. 1914. [S 2876] Perrin. 1903. [S 2920] Stewart. 1912.

— *v. Acids. Affinity. Allotropism. Atomic Theory. Catalysis. Chemistry, Principles of. Colloids. Molecular Volumes. Organic Radicals. Periodic Law. Phase Rule. Polyatomic Compounds. Radical Theory. Solubilities. Solution, Theory of. Stoichiometry. Substitution Theory. Transpiration (Liquid). Types, Theory of. Valency.*

— (PHYSIOLOGICAL): [525] Boyle. 1669. [1776] Hammarsten. 1899. [2529] Lehmann. 1851-4. [2617-19, 2623-5, 2627] Liebig. 1842-70. [3143] Mulder. 1849. [3368] Odling. 1866. [4180] Salkowski. 1893. [6404-6] Boyle. 1661-9. [6453] Brasch. 1901. [8256]. Gamgee. 1880. [8277] Garnier. 1896. [8697-8] Griffiths. 1846-53. [9452] Hoppe-Seyler. 1877-81. [9561] Humboldt. 1797. [10149] Kingzett. 1878. [10691] Lehmann. 1851-4. [10835-9, 10848] Liebig. 1842-7. [11262] Macvicar. 1871. [11403] Marchand. 1842-4. [13396] Plenck. 1797. [13740-1] Prout. 1827-34. [13840] Raffe. 1873. [13988] Rees. 1842. [14006] Reid and Hambly. 1895. [14968] Snyder. 1903. [15283] Thorpe. *n.d.* [15540-1] Widmer. 1751-3. [S 2638, 2642] Berzelius. 1813-31.

— *v. Albumen. Alkaloids. Blood. Butyric Acid. Caloric Action. Capillary Tubes, Chemical Effect of. Carbon Dioxide absorbed by Plants. Cell (Living), C. of the Chlorophyll. Coagulation. Cooking. Digestion. Fermentation. Food. Lactic Acid. Metabolism. Milk. Nitrogen absorbed by Plants. Osmosis. Oxygen given off by Plants. Plants, C. of. Poisons (Animal). Proteids. Respiration. Starch. Urine. Wood, C. of.*

— (POPULAR): [2172-5] Johnston. 1855-9. [2613-16] Liebig. 1844-78. [3842] Prout. 1834. [4382] Sibson. 1861. [7526] Ellis. 1852. [9834-5] Johnston. 1859-79. [10552-3]

CHEMISTRY (POPULAR), continued:

Lassar-Cohn. 1905-9. [10840-1] Liebig. 1851-9. [11396-7] Marcet. 1813-53. [14777] Scoffern. 1848. [SS 2618] Scoffern. 1839.

— (PRACTICAL): [443] Bloxam. 1886. [514] Bowman. 1861-2. [1636] Gray. 1828. [1775-6] Harcourt. 1872-87. [3366-7] Odling. 1854-65. [3935] Reid. 1830. [6963] Clowes. 1890. [8895] Harcourt and Madan. 1897. [11203-4] Mackenzie. 1823-5. [13986] Reece. 1814. [14837] Shaw and Hawksbee. 1731. [SS 2406-7] Accum. 1803.

— *v. Chemistry (Applied).*

— (STEREO-): [423] Bischoff. 1904. [1959] Hoff. 1892. [2975] Meyer. 1890. [4590] Stewart. 1907. [5536] Wurtz. 1876. [8924] Harper's Scientific Memoirs. 1901. [15604] Wislicenus. 1889. [17297] Bischoff. 1894. [17307] Hoff. 1892. [17313] Mamlock. 1907. [17326] Stewart. 1907. [S 2998] Asch. 1913.

— *v. Chemical Structure Theory. Isomerism. Metamerism.*

— (SYNTHETIC): [357-8] Berthelot. 1864-97. [609] Brown. 1870. [6159] Berthelot. 1860. [11730] Meldola. 1904. [13120] Perkin. 1908. [SS 2529] Hanriot, etc. 1914.

— *v. Alcohol (Synthetic). Coal Tar Colours.*

— (THEORETICAL): [2973] Meyer. 1892. [3200] Nernst. 1900. [3963] Remsen. 1892. [14022] Remsen. 1877. [17308] Hoff. 1899-1901. [17319] Meyer. 1907. [S 2779] Hoff. 1898-9. [S 2864] Nernst. 1911. [S 2906] Scherer. 1795. [SS 2046-7] Accum. 1803.

— *v. Chemical Theories. Salts, Theory of. Solutions, Theory of.*

— (THERMO-): [3139] Muir and Wilson. 1885. [3192] Naumann. 1882. [6160] Berthelot. 1879. [12256] Muir and Wilson. 1885.

— *v. Cryometry. Explosion.*

—, BIBLIOGRAPHY OF: [5464] Wolff. 1845. [7014] Cooper. 1675. [7598] Erxleben. 1784. [7831] Ferguson. 1906.

—, HISTORY OF: [863-4] Cooke. 1874-84. [2327] Kopp. 1843-7. [2968] Meyer. 1891. [3405] Ostwald. 1908. [4837] Thomson. c. 1833. [5529-30] Wurtz. 1868-9. [7068] Crell. 1786. [7822] Fechner. 1832-3. [8538] Gorton. 1910. [9361, 9363] Høfer. 1842-72. [10005] Kastner. 1814. [10053] Kemp. 1855. [10110] Kerckhoff. 1858. [10276-81] Kopp. 1843-73. [11808] Meyer. 1891. [14383] Rodwell. 1874. [14739] Schorlemmer. 1894. [15274-5] Thomson. 1830-1. [15285] Thorpe. 1902. [17323] Ostwald. 1906. [S 2853] Meyer. 1906. [S 2919-20] Stewart. 1911-12. [S 2954] Yeats. 1798. [SS 2423] Bergman. 1788-91. [SS 2622] Schorlemmer. 1879.

— *v. Chemistry (New). Drugs, H. of. Elements (Chemical), H. of.*

—, PRINCIPLES AND ELEMENTS OF: [933-4] Dalton. 1808-27. [974-5] Davy. 1812. [1383-6] Fourcroy. 1792-1806. [1451] Galloway. 1888. [1669] Gren. 1800. [1916] Higgins. 1786. [2215] Kane. 1842. [2497-2500] Lavoisier. 1789-1802. [2945] Mendeléeff. 1891. [3138] Muir. 1884. [3321-2] Nicholson. 1790-6. [3514] Peart. 1789. [5245-6] Watson. 1768. [6426] Boyle. 1661. [7153-5] Dalton. 1808-27. [7161] Daniell. 1839. [7598] Erxleben. 1784. [8059, 8062-5] Fourcroy. 1795-1806. [8482] Gmelin. 1780. [8678] Gren. 1800. [9574] Hunt. 1887. [9861] Jones. 1912. [10005] Kastner. 1814. [10598-10605] Lavoisier. 1789-99. [10645] Leboulenger. 1624. [10878] Link. 1795-7. [11748] Mendeléeff. 1890.

CHEMISTRY, PRINCIPLES AND ELEMENTS OF, *continued* :

[11885] Mills. 1876. [12255] Muir. 1884. [12348-9] Naquet. 1867-8. [12656-8] Nicholson. 1790-2. [13395] Plenck. 1801. [13420] Playfair. 1858. [14004] Reid. 1839. [15269] Thomson. 1825. [17300] Carnegie. 1894. [17137-18] Mendeléeff. 1891-1905. [17327] Tilden. 1901. [S 2668-70] Boyle. 1661-80. [S 2910] Shaw. 1730. [SS 2495] Fourcroy. 1807. [SS 2563-4] Lavoisier. 1802. [SS 2627] Swedenborg. 1847.

— *v. Chemical Analysis, P. of. Radical Theory. Substitution Theory. Types, Theory of. Valency.*

—, RETARDING ACTION IN : [11886] Mills. 1877.

—, TEACHING OF : [600] Brodie. 1880. [4442] Smith and Hall. 1902. [6701] Cannizzaro. 1872. [7917] Fischer. 1897.

—, USES OF : [6138] Bergman. 1783. [S 2625] Bergman. 1784.

CHES, MATHEMATICS OF : [5125] Vospicelli. 1850. [S 3861] Jaenisch. 1862-3.

— PLAYER ('AUTOMATON') : [5445] Windisch. 1784.

CHIMNEYS AND STOVES : [168] Arnott. 1855. [1481-4] Gauger. 1713-36. [4936] Tredgold. 1824. [5842] Arnott. 1838. [6400] Boyers. 1807. [6935] Clavering. 1779. [8129] Franklin. 1793. [8358] Gérard. 1828. [9080] Hébrard. 1756. [13935] Rawlinson. 1858. [14954-5] Smith. 1854.

— *v. Smoke Abatement. Ventilation and Heating.*

CHLADNI'S FIGURES—*v. Acoustic Figures.*

CHLORATE INDUSTRY (ELECTROLYTIC) : [10124] Kershaw. 1905.

CHLORIDE PROCESS (VINCENT'S) : [14445] Roscoe. 1879.

— OF NITROGEN : [11743] Mémoires. 1807-17.

CHLORINE AND ITS COMPOUNDS : [978-9] Davy (J.). 1812. [1288] Faraday. 1859. [4492] Société Chimique. 1889-92. [6856] Chevallier. 1829. [7769-70] Faraday. 1823-59. [8163] Fritzsche. 1860. [8554] Graham. 1837. [9152] Henry. 1810. [14473] Rose. 1832. [14697] Scheele. 1786.

— *v. Hydrochloric Acid. Hypochlorites. Iron, Perchloride of.*

CHLOROPHYLL : [2084-5] Ingenhousz. 1779-85. [14817] Senebier. 1783. [S 2946] Willstätter und Stoll. 1913. [SS 2619] Senebier. 1782.

CHROMATICS—*v. Colours, Theory of.*

CHROMIUM AND ITS COMPOUNDS : [14473] Roscoe. 1832. [S 2808] Le Blanc. 1904.

CHRONOLOGY : [142] Arbutnot. 1900. [2081] Ideler. 1825-6. [2269] Kepler. 1615. [3240-1] Newton. 1728. [4692] Swan. 1653. [5451] Wislicenus. 1895. [6207-8] Beveridge. 1669-1705. [7544] Emerson. 1770. [9069] Heath. 1760. [9356] Hodgson. 1747. [9455] Hopton. 1616. [10512] La Prise. 1780. [11612] Matzka. 1844. [12249] Mulerius. 1630. [12574-5] Newton. 1728. [12924] Padovani. 1563. [14166] Riccioli. 1669. [14628-9] Saigey. 1834. [15515] Wetherald. 1760. [16866] Ideler. 1825-6. [S 1496] Ideler. 1831. [SS 980] Albumasar. 1489. [SS 1024] Calvisius. 1685. [SS 1286] Scaliger. 1658. [SS 1333] Warren. 1825.

— *v. Almanacs. Calendar.*

CHRONOMETERS : [1155] Eiffe. 1842. [3133] Mudge. 1799. [5979] Barlow. 1821. [6170-2] Berthoud. 1773. [7111] Croucher. c. 1810. [7437-8] Earnshaw. 1808. [7474] Eiffe. 1842. [8891] Hansen. 1836. [8955, 8958-9, 8962, 8964-6, 8970] Harrison. 1737-1869. [8985] Harvey.

CHRONOMETERS, *continued* :

1823. [9977-8] Kaiser. 1868-87. [11542-3, 11550] Maskelyne. 1767-92. [12240-3] Mudge. 1781-99.

— *v. Horology.*

CHRONOMETRICAL OBSERVATIONS : [4649] Struve. 1844.

CHRONOMETRY : [1965] Holden. 1694. [2010] Houzeau. 1853. [2187] Jordan. 1885. [3525] Pellizer. 1800. [4216] Saunier. 1858. [5220] Warner. 1869. [5933] Baily. 1824. [6672] Calandrelli. 1850. [8312] Gautier. 1894. [8992] Harzer. 1899. [9761] Janvier. 1821.

— *v. Day, Length of.*

CIDER : [4361] Shannon. 1805. [8903] Hardy. 1785. [10231-2] Knight. 1813. [10302] Krebs. 1887. [10751] Le Sourd. 1892.

CIRCLE (REPEATING) : [SS 1554] Borda. 1802.

—, DIVISION OF THE : [5654] Adamson. 1815. [5905, 15702] Bachmann. 1872. [S 727] Gauss. 1801.

—, GEOMETRY OF THE : [748] Ceulen. 1619. [1664] Gregory. 1668. [2062] Huygens. 1654. [2396] La Loubère. 1651. [2874] Maseres. 1758. [3693] Poleni. 1712. [4362] Sharp. 1717. [4601] Stewart. 1746. [5739] Alvord. 1855. [5820] Archimedes. 1676. [6676] Caldani. 1782. [6768] Cataldi. 1612. [7038-9] Cotes. 1722. [7305] Dodt van Flensburg. c. 1835. [7984] Floryn. c. 1814. [9094] Hellins. 1794. [9626] Huygens. 1654. [10727] Léotaud. 1663. [11532] Maseres. 1758. [11989-91] Moivre. 1730. [14028] Renaldini. 1655. [14500] Rothe. 1805. [14750] Schöttel. 1754-6. [14959] Snell. 1621. [15991] Fiedler. 1882. [16133-4] Hesse. 1881-1906. [16337] McClelland. 1891. [16523] Richter. 1908.

— *v. Apollonian Problem.*

— OF PROPORTION—*v. Compass of Proportion.*

— SQUARING : [652] Buteo. 1559. [705] Carrick. 1876. [1311] Fauré. 1749. [1651] Gregorius a Sto. Vincentio. 1647-9. [1790] Harris. 1874. [1825] Hayden. 1872. [1949] Hobbes. 1669. [2103] J. (S. B.). 1871. [2548] Léotaud. 1654. [2834] Marsson. 1770. [2982] Miladowski et Izbiecki. 1850. [3058] Monti. 1830. [3062-3] Montucla. 1754-1831. [3078] Morgan. 1872. [3470] Parsey. 1832. [3659] Playfair. 1819-22. [3708-9] Porta. 1610. [3918] Recordon. 1865. [3927] Regiomontanus. 1533. [4093] Rossi. 1804. [4125] Rudio. 1892. [4453-6] Smith. 1861-70. [4631] Storms. 1633. [5010] Uffenbach. 1653. [5331] West. 1875. [6074] Beaulieu. 1676. [6438] Bradwardine. 1495. [6768] Cataldi. 1612. [6943] Clavius. 4612. [7736] Faber. 1507. [7909] Fine. 1556. [8652] Gregorius a Sto. Vincentio. 1647-9. [8933] Harris. 1884. [9341-2] Hobbes. 1681-5. [10336] Kuntze. 1792. [10727] Léotaud. 1663. [12044] Montucla. 1754. [12090-1] Morgan. 1872. [12282] Münchhausen. 1739. [12981] Parsey. 1832. [13414-17] Playfair. 1804-36. [15312] Tomassi. 1817. [15394] Viète. 1591. [15423] Wayvel. 1712. [15452] Wallis. 1669. [15456] Ward. 1698. [16144] Hobson. 1913. [16399] Monteil. 1912. [SS 250] Büchten. 1756. [SS 335] Coriarius. 1766. [SS 632] Mallemet de Messange. 1686. [SS 767] Roemen. 1597.

— *v.  $\pi$  (Value of).*

CISSOIDS : [12676] Nicolas. 1696-7.

CITRIC ACID : [13272] Phipson. *n.d.* [14697] Scheele. 1786.

- CIVIL ENGINEERING: [2748] Macgregor. 1894. [3894] Rankine. 1865. [6457] Brees. 1844. [7081-2] Cresy. 1861. [7565] Endrés. 1884-8. [7880] Fieberger. 1905. [8660] Gregory. 1842. [8799] Haldane. 1890. [8999] Haskoll. 1858-68. [10610-12] Law and Burnell. 1852-82. [10732] Lesage. 1810. [11277-9] Mahan. 1838-64. [11710] Medley. 1871-8. [11873] Millington. 1839. [13898] Rankine. 1873. [14780-1] Scott. 1874-81. [15062] Stevenson. 1838. [17351] Rankine. 1898. [S 3350] Bédior. 1813. [S 3395] Civil Engineering. 1899.
- , HISTORY OF: [14070. 14073] Rennie 1839-74.
- , LAW: [11156] Macassey and Strahan. 1890.
- CLAIRAUT'S THEOREM: [799] Clairaut. 1743. [6997] Collins. 1853.
- CLASSIFICATION OF SCIENCE: [5748] Ampère. 1834-43.
- CLIMATOLOGY: [1099] Dubois. 1895. [4450] Smith. 1872. [5389] Whistlecraft. 1840. [6274] Blodget. 1857. [7087] Croll. 1875. [9510-12. 9515] Howard. 1818-54. [10415] Lais. 1873. [10831] Liais. 1872. [12486] Newnham. 1869. [13674] Prince. 1886. [13796] Quetelet. 1845. [13862] Ramsay. 1884. [15550] Williams. 1806. [S 2506] Dove. 1857-69. [S 2519] Hann. 1897.
- (GEOLOGICAL): [7087] Croll. 1875. [8328] Geikie. 1877. [10694] Le Hon. 1877. [S 2606] Whitney. 1882.
- CLOCKS (ELEMENTAL): [12888] Ozanam. 1725-50.
- (SYMPATHETIC): [7511] Ellicott. c. 1740.
- CLOUDS, ATLAS AND PHOTOGRAPHS OF: [4526] Specola Vaticana. 1891-3. [17392] Hildebrandsson, etc. 1896.
- , FORMATION OF: [4667] Sturgeon. 1848. [4977] Tyndall. 1872-85. [5614] Abercromby. 1888. [6127] Bennet. 1789. [8848] Hamilton. 1772.
- , *v. Fog, Rain.*
- , IRIDESCENCE IN: [15111] Stoney. 1887.
- , NOMENCLATURE OF: [2012] Howard. 1832. [8039-40] Forster. 1815-23. [9514] Howard. 1832. [14586] Russell. 1883.
- COACH BUILDING—*v. Carriage and Coach Building.*
- COAGULATION: [10388] Laer. 1905.
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- INDUSTRY—*v. Refrigeration.*
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- *v. Irradiation.*
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- COLOURS—*v. Paints and Colours.*
- (ACCIDENTAL): [SS 2060] Scherffer. 1761.
- (MINERAL): [11409] Marucci. 1816.
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— TRADE: [13737] Provis. 1801.
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— *v. Gun Cotton. Smokeless Powder.*
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 the. Meteoritic Hypothesis. Moon and Earth  
 Compared. Nebular Hypothesis. Planets,  
 Origin of. Plurality of Worlds. Tidal Friction.*  
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 Wilkins. 164 [SS 831] Schott. 1668.  
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 Crystals.*  
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 CRYSTALS (FLUID): [17376] Schenck. 1905.  
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 CURVE TRACING: [8168] Frost. 1872. [9828-9]  
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- (CIRCULAR): [14299] Roberts. 1869.
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- *v. Brachistochrone.*
- (KINEMATIC): [13133] Perigal. *n.d.* [16713] Taylor. 1874-5.
- (PARALLEL): [11029] Lotteri. 1792.
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Reidt. 1874. [16629-30] Scott. 1880-1904.  
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1903. [S 727] Gauss. 1801.  
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Moxon. 1703. [3152-3] Münster. 1531-51.  
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Wilson. 1724. [5513] Wright. 1614. [5540]  
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Lesow. 1713-14. [10772-4] Leurechon. 1652-74.  
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Mogge. 1666-75. [12003] Mollet. 1820.  
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Philips. 1786. [13576] Powell. 1661. [13778]  
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DIALLING, *continued*:

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Ste.-Marie Magdelaine. 1645-1701. [14820]  
Serle. 1664. [14831] Settele. 1816. [15032]  
Stengel. 1680. [15045] Sternheim. 1835.  
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1631-51. [15352] Turner. 1750-2. [15399]  
Vimercato. 1672. [15409-11] Vitruvius.  
1511-1649. [15504] Wells. 1725. [15634]  
Nuñez. 1592. [SS 366] Dürer. 1532. [SS 438]  
Galgenair. 1655. [SS 831] Schott. 1668.  
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Blaise. 1744. [SS 1357] Blaen. 1652. [SS 1358]  
Bonhomo. 1758. [SS 1359] Bosse. 1643.  
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Stirling. 1764. [7038-9] Cotes. 1722. [7541]  
Emerson. 1767. [12572-3] Newton. 1711.  
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1730-64.

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— *v. Fermentation.*  
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- DIVING BELLS AND APPARATUS : [4277] Schott. 1664. [4416-18] Sinclair. 1672. [4426] Smeaton. 1791. [7190] Davis. 1909. [14747-9] Schott. 1664-87. [14893] Sinclair. 1669. [14913-15] Smeaton. 1791. [15387] Veranzio. c. 1595 [15539] White. 1677.
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- DRAINAGE : [1013] Denton. 1883. [4199] Salusbury. 1661. [5231-2] Waring. 1867-76. [5320] Wells. 1830. [6574] Buchan. 1883. [6983] Coleman. 1896. [9841] Johnstone. 1834. [11066] Lucas. 1903. [12919] Page. 1794. [14057-8. 14062-3] Rennie (J.). 1800-10. [14072. 14077] Rennie (Sir J.). 1837-42. [14925] Smeaton. c. 1769. [14956] Smith. 1806. [15059] Stevenson. 1874. [15297] Tigt. 1903. [15460] Waring. 1891.  
— *v. Mine D.*
- DRILLING—*v. Boring.*
- DROUGHTS : [9579] Hutchinson. 1789.
- DRUGS, HISTORY OF : [8738] Guibourt. 1820.
- DRUMMOND LIGHT : [14081] Renton. 1860.
- DRY ROT : [5707] George. 1829. [6516] Britton. 1875. [12934] Papworth. 1803. [SS 3127] Blackburn. 1817.
- DRYING, TECHNIQS OF : [6962] Clöter. 1837.
- DUALITY, PRINCIPLE OF : [6830] Chasles. 1875. [13438] Plücker. 1839. [13490] Poncelet. 1822. [16493-4] Poncelet. 1862-6. [SS 860] Steiner. 1832.  
— *v. Arithmetic (Dual). Geometry (Enumerative). Polars (Reciprocal).*
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— *v. Decimal S.*
- DUPIN'S THEOREM : [1123] Dupin. 1813.
- DUPPLICATION OF THE CUBE : [399] Biering. 1844. [1081] Doria. 1722. [1949] Hobbes. 1669. [3955] Reimer. 1798. [6716] Caracciolo. 1790. [7909] Fine. 1556. [15394] Viète. 1591. [15452] Wallis. 1669.
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- *v. Bleaching, Calico Printing, Coal Tar Colours, Colour, Indigo, Lac.*
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— *v. Centrifugal and Centripetal Forces, Kinetics, Motion, Vis Viva.*

— (GRAPHIC): [13728] Proell. 1874.

— (MOLECULAR): [10060] Kelvin. 1904-5.

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— *v. Couples, Motion of Points.*

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— *v. Armatures, Electric Commutation, Electric Currents.*

**DYNAMOMETER (FRICTION; 'FREIN-PRONY'):** [13352] Piobert et Tardy. 1840. [13731] Prony. *c.* 1821.

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— *v. Electrodynamometer.*

**EAR TRUMPET:** [9031] Hautefeuille. 1788.

— *v. Speaking Trumpet.*

**EARTH, DENSITY OF THE:** [5676] Airy. 1856 [6750-1] Casati. 1656-8. [13581-2] Poynting. 1892-4.

— *v. Pendulum Observations.*

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— *v. Geodesy.*

— MOTION OF THE (COPERNICAN THEORY): [16894] Neisser. 1907.

— *v. Copernican System and Theology.*

— ROTATION OF THE (FALL-EXPERIMENTS): [338] Benzenberg. 1804. [776] Cheyne. 1867. [5509] Worms. 1862. [2430] Lansberg. 1650. [6750-7] Casati. 1655-8. [6861] Cheyne. 1867. [14000] Reich. 1832. [14827] Sheeres. 1698. [S 291] Foucault. 1878. [S 1453] Gilbert. 1883. [S 2491] Darwin. 1877. [SS 1756-9] Guglielmini. 1789-92.

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— *v. Flat Earth Paradox.*

— MODIFIED BY HUMAN ACTION : [11453] Marsh. 1874.

EARTHQUAKES—*v. Seismology.*

EARTHWORK, CALCULATION OF : [4924] Trautwine. 1853. [9526] Hudson. 1902. [9535] Hughes. 1846. [10048] Kelly. 1847. [12242-4] Macneill. 1833-46.

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EASTER, TIME OF : [384] Bettazzi. 1733-4. [8304] Gauss. 1810.

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— *v. Lunar E. Solar E.*

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ELECTRIC ATTRACTION AND REPULSION : [SS 1592-4] Cabcé. 1629. [SS 1750-2] Guericke. 1672.

— *v. Coulomb's Law.*

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— *v. Accumulators.*

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— *v. Lightning Conductors.*

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- *v. Electricity (Experimental). Electro-magnetic E.*
- FIELD OF FORCE—*v. Electromagnetic F. of F.*
- FIGURES : [5832] Armstrong. 1897-9. [14252] Riess. 1861.
- *v. Lichtenberg's F.*
- FURNACE : [9845] Joly. 1901. [10136-8] King. 1908-9. [S 3168] Borchers. 1908. [S 3283] Moissan. 1897. [SS 2898] Borchers. 1897.
- HARPSICORD : [SS 1829] Laborde. 1761. [SS 1875] Mariani. 1767.
- HAULAGE—*v. Telferage.*
- INFLUENCE : [SS 1485-6] Aepinus. 1759.
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- PHASES : [SS 1737] Gross. 1776.
- PHENOMENA : [1811] Hauksbee. 1709. [1917] Higgins. 1814. [4994] Tyndall. 1873. [5834] Arnim. 1799. [9003] Hasselberg. 1879. [9023-7] Hauksbee. 1709-19. [10692] Lehmann. 1898. [14861-2] Sigaud de la Fond. 1785. [SS 1529] Becaria. 1749. [SS 1768] Hauksbee. c. 1735. [SS 1780] Herbert. 1778.
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- POWER STATIONS : [1721] Guy. 1891. [8313] Gay and Yeaman. 1899. [9083] Hedges. 1892. [14788] Seabrook. 1913. [S 3702-3] Wordingham. 1901-3.
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- *v. Wheatstone's Bridge.*



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— *v. Oscillation Transformers.*

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— *v. Lightning.*

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ELECTRICITY (GALVANIC), *continued :*

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— (MEDICAL) : [11385] Marat. 1784. [14858] Sigaud de la Fond. 1802. [15566] Wilkinson. 1783. [SS 2016] Rabiqueau. 1753.

— (PHOTO-) : [S 1999] Hughes. 1914.

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— *v. Electron Theory. Electrons. Ions.*

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- v. *Guano. Nitragin*.
- FIGURES (INSCRIBED AND SUPERSCRIBED), GEOMETRY OF: [6376] Boulliau. 1657.
- FILMS (THIN LIQUID): [14015-17] Reinold and Rücker. 1881.
- v. *Soap Bubbles*.
- FINITE DIFFERENCES—v. *Calculus of Finite Differences*.
- MAGNITUDES, ANALYSIS OF: [10006] Kästner. 1760.
- FIRE ARMS: [121] Antoni. 1789. [1406] Fraxno. 1850. [1499] Gaya. 1678. [2149] Jervis. 1859. [2969] Meyer. 1837. [4255-6] Schmidt. 1842-3. [4713] Tackels. 1866. [5396] Whitworth. 1858. [6071] Beaufoy. 1808. [6313] Bond. 1888. [7595] Erdmannsdorff. 1845. [7912] Fire Arms. 1829. [8130] Franklin. 1874. [8188-9] Furtenbach. 1644-62. [8631] Greener. 1896. [11294] Magné de Marolles. 1788. [11332] Mangeot. 1851. [11440] Marks. 1898. [12028] Monterey. 1868. [12063] Morandotti. 1886. [12064] Mordecai. 1860. [12749] Norton. 1880. [12825] Oppert. 1880. [12909] Panot. 1851. [14778] Scoffern. 1858-9. [S 3688] Whitworth. 1873. [SS 2845-6] St. Remy. 1707-41. [SS 3016] Greener. 1846.
- v. *Gunnery and Artillery. Machine Guns. Revolver. War Engines*.
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- FLAT EARTH PARADOX: [702] Carpenter. 1871. [4109] Rowbotham. 1864. [4304] Scott. 1901. [12612] Mercier. 1806.



- FLOATING BODIES: [152. 5821-2] Archimedes. 1565. [5867] Atwood. 1796.
- FLUIDS—*v. Liquids.*
- FLUORESCENCE: [2293-4] Kircher. 1646-71. [3641] Pisko. 1861. [10161] Kircher. 1671.
- FLUORINE AND ITS COMPOUNDS: [4492] Société Chimique. 1889-92. [7195] Davy. 1814. [11811] Meyer. 1903. [11978-9. 11981-2] Moissan. 1897-1906. [12669. 12674-5] Nickles. 1857-8. [14473] Rose. 1832. [14626-7] Sage. 1773. [14697] Scheele. 1786. [14707] Scheerer und Drechsel. 1873. [15288] Thorpe and Kirwan. 1892. [15505] Wenzel. 1783.
- FLUXIONS—*v. Calculus (Fluxional).*
- FOG, FORMATION OF: [13084] Peltier. 1842.
- FOOD, CHEMISTRY AND ANALYSIS OF: [106] Andrews. 1901. [2324] König. 1889. [6111-12] Bell. 1886. [6886-7] Church. 1876-89. [8079] Fox. 1878. [10225] Knapp. 1848. [11400] Marcet. 1856. [13421] Playfair. 1853. [13741] Prout. 1827. [14172] Richards and Woodman. 1900. [17311] König. 1903-10. [17325] Röttger. 1907.
- *v. Breadingmaking. Cooking. Starch.*
- , PRESERVATION OF: [14380] Rocques. 1906.
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- *v. Energy. Motion.*
- ('VITAL'): [14001. 14003] Reichenbach. 1850-1.
- FORCES, AGGREGATION OF: [12112] Morgan. 1859.
- , COMPOSITION OF: [5053] Verdam. 1825.
- , CORRELATION OF—*v. Correlation (Physical).*
- , DECOMPOSITION OF: [13892] Rankine. 1872.
- , DIAGRAMS OF: [S 2125] Maxwell. 1870.
- , IDENTITY OF: [8507] Goodman. 1847.
- , PARALLELOGRAM OF—*v. Parallelogram of F.*
- , TRIANGLE OF—*v. Triangle of F.*
- FORMS (CANONICAL): [4704] Sylvester. 1851.
- (IMAGINARY ALGEBRAIC): [16747] Vallés. 1869-76.
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- *v. Geometry (Four-dimensional).*
- FRACTIONS (CONTINUED): [722] Cataldi. 1613. [14765] Schwenter. 1616-18. [16474] Perron. 1913. [SS 421] Faulhaber. 1622.
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- (VULGAR): [583] Bridge. 1718. [1393] Fractions. 1738. [11752] Mengoli. 1650.
- AS DECIMALS: [1596-7] Goodwyn. 1823.
- FRAUENHOFER'S LINES: [10320] Kuhn. 1853.
- *v. Spectroscopy.*
- FREE WILL, MATHEMATICAL THEORY OF: [S 244] Boussinesq. 1878.
- FREEZING MIXTURES: [289] Bate. 1634. [536] Boyle. 1665. [6043-4] Bate. 1634. [6248] Black. 1777. [6796-7] Cavendish. 1786-8. [7444] Edinburgh Essays. 1754-71. [13136-7] Perrault. 1721. [15620] Edinburgh Essays. 1770-1. [S 2677] Boyle. 1683. [SS 30] Bate. 1631.
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- *v. Ball-Bearings. Machinery, Lost Work in. Viscosity.*
- FROSTS (HISTORICAL): [4697] Swinden. 1778 [10291] Krafft. 1741.
- FUCHS'S THEOREM: [13459] Poincaré. 1885.
- FUEL: [9477] Hospitalier. *v. y.* [10764] Lewes. 1907. [11889-90] Mills and Rowan. 1889. [14849] Siemens. 1873.
- *v. Charcoal. Coal Dust Firing. Combustion. Gas Firing. Sulphides as Fuel.*
- (GASEOUS): [4853] Thwaite. 1889. [9522] Hubert. 1900. [12392] Naumann. 1881. [14524] Rowan. 1886. [S 3078] Lewes. 1907.
- *v. Power Gas Production. Water Gas.*
- (LIQUID): [11738] Melville. 1904. [13022] Paul. 1868. [S 3007] Booth. 1911. [S 3078] Lewes. 1907.
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- *v. Machinery, E. of. Steam Economy.*
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- *v. Potential.*

- FUNCTIONS (ABELIAN):** [6-7, 5611-12] Abel. 1839-81. [10193] Klein. 1899. [12448] Neumann. 1884. [12707] Noether. 1890. [14249] Riemann. 1857. [15790] Briot. 1879. [15876] Clebsch. 1875-91. [SS 69] Gauss. 1870-1906. [SS 519] Jacobi. 1881-4.
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- (**CONJUGATE**): [8868] Hamilton. 1835.
- (**CYLINDER**): [12444] Neumann. 1881. [16437] Nielsen. 1904.
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- *v. Attraction of Ellipsoids.*
- (**HOMOGENEOUS**): [SS 170] Aronhold. 1858.
- (**HYPERBOLIC**): [10085] Kennelly. 1912. [SS 432-3] Forti. 1863. [SS 472] Gudermann. 1833.
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- (**LAMÉ'S**): [2413-14] Lamé. 1857. [4878-9] Todhunter. 1875. [10439] Lamé. 1857.
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- (**POLYEDRIC AND MODULAR**): [16753] Vivanti. 1910.
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- **TABLES OF**: [2526] Legendre. 1825-8. [16181] Jahnke und Emde. 1909. [SS 432-3] Forti. 1863.
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- FURNACES**: [6008] Barr. 1899. [10789-90] Lewis. 1763. [13935] Rawlinson. 1858.
- *v. Electric Furnace.*
- FUSES**: [11176] Macdonald. 1819. [13316] Pictet. 1848.
- GALILEO'S DISCOVERIES, CONTROVERSIES ON**: [251] Baliani. 1638. [1359] Fontana. 1646. [5954] Baliani. 1638. [7999-8001] Fontana. 1646. [8585-7] Grassi. 1619-26.
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- GALLS, CHEMISTRY OF: [3142. 12247] Mulder. 1847.
- GALVANISM — *v. Electricity (Galvanic)*.
- GALVANOMETER: [92] Ampère. 1826.
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- GARNET: [13360] Pisani. *s. d.*
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- *v. Producer Gas. Water Gas.*
- ENGINES — *v. Engines (Gas)*.
- FIRING: [6660] Cabrol. 1837. [11405] Marchis. 1906. [13774] Putsch. 1901.
- FITTING: [6247] Black. 1886.
- LIGHTING: [18-20. 22-4] Accum. 1815-20. [2904] Matthews. 1832. [3343] Nodier. 1823-4. [3519] Peckston. 1823. [3526] Pelouze et Audouin. 1878. [4250] Schilling. 1879. [5629-30. 5632-4] Accum. 1816-20. [5707] Aldini. 1823. [7280] Dibdin. 1902. [7485] Electric and Gas Exhibition. 1884. [8192] Fyfe. 1842. [8283] Gas Lighting. 1849-96. [9476] Gas Lighting. *v. y.* [10765] Lewes. 1897. [11594-5] Matthews. 1827-32. [12294-7] Murdock. 1808-9. [13042-4] Peckston. 1819-41. [13060] Pécelet. 1827. [14608. 14610] Rutter. 1833-49. [15483] Webber. 1907.
- *v. Acetylene. Coal Gas.*
- (INCANDESCENT): [9476] Hospitalier. *v. y.* [9659] Incandescent Gas Light Co. 1896. [S 3066] Johnstone. 915.
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- *v. Air. Argon. Krypton. Nitrogen. Oxygen.*
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- *v. Occlusion.*
- ELECTRICITY IN — *v. Electricity in Gases.*
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- *v. Radiometer. Vapour Densities. Vapour Pressure. Viscosity.*
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- *v. Air (Liquid). Carbon Dioxide, L. of. Critical Point. Oxygen (Liquid).*
- PHYSICAL PROPERTIES OF: [12767] Nystrom. 1876.
- *v. Pneumatics.*
- POLARIZATION STRESS IN: [15120] Stoney. 1878.
- PRESSURE OF — *v. Manometers.*
- PURIFICATION OF: [11979] Moissan. 1906.
- SPECTRA OF — *v. Spectra of G.*
- THERMAL CONDUCTIBILITY OF: [3794-5. 13655-7] Priestley. 1790.
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- , LAWS OF: [16596] Schoenflies. 1908.
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- *v. Circle Squaring. Duplication of the Cube. Perspective P. Trisection of an Angle.*
- PROBLEMS AND EXERCISES: [434-5] Bland. 1827-42. [734] Cavalieri. 1647. [2411] Lamé. 1818. [3438] Palliser. 1871. [3858] Puissant. 1824. [4167] Saccheri. 1693. [4528] Spidell. 1617. [4552] Stainville. 1809. [4698] Swinden. 1786. [5110-11] Viviani. 1677-92. [5745] Amiot.

GEOMETRICAL PROBLEMS AND EXERCISES, *continued* :

1877. [7247] Desboves. 1875. [8285-6]  
 Gaskin. 1847. [11382] Marchetti. 1675. [14567]  
 Rudd. 1650. [14734-5] Schooten. 1657.  
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 Speidell. 1616-27. [15078] Stevinus. 1583.  
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 Aubert et Papelier. 1908-10. [15850-1]  
 Catalan. 1872-9. [15863] Charruit. 1897.  
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 1870-5. [16035-6] G.-M. 1896-1912. [16325]  
 Lormeau et Merlet. 1909. [16340] McDowell.  
 1892. [16477-8] Petersen. 1879-92. [16511-12]  
 Reidt. 1894-7. [16529-31] Ritt. 1857-73.  
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 Viète. 1646. [15877] Clement-Jones. 1912.  
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 Hesse. 1861. [2069-70] Hymers. 1830-6.  
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 Leslie. 1809-21. [2684] Loney. 1904. [2746]  
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 Narrien. 1846. [3361] O'Brien. 1844. [3382]  
 Olney. 1884. [4186-7] Salmon. 1862-82.  
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 1867. [5137] Vyvyan. 1870. [5184-5] Wallis.  
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 Biot. 1843. [6507] Briot et Bouquet. 1878.  
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 7] Gregory and Walton. 1845-52. [8677]  
 Grelle. 1861. [8854-6] Hamilton. 1827-38.  
 [9641] Hymers. 1836-48. [10517] Lardner.  
 1827. [10678-9] Lefebure de Fourcy. 1846-71.  
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 1811-21. [10990-1] Loney. 1895-6. [12017]  
 Monge. 1807. [12775] O'Brien. 1844. [1646-  
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 1657. [15025] Staude. 1905. [15164] Sturm.  
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 1882. [15722] Bell. 1910. [15769-70] Boset.  
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 et Bouquet. 1864-90. [15840-1] Carnoy. 1899-  
 1905. [15883-5] Combetti. 1896-1901. [15898]  
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 Rudio. 1901-6. [16116] Heffter and Koehler.  
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 1908. [16531-2] Salmon. 1882-1915. [16570]  
 Schendel. 1874. [16590] Schlotke. 1891.  
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 Systems.*  
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GRAPHIC CALCULUS—*v. Calculus (Graphic).*

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— *v. Hydrometry. Hydrostatic Balance.*

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— *v. Calculus (Barycentric). Guldin's Theorem.*

GREENSTONE: [6583] Buckland. 1816.

GROUPS (CONTINUOUS): [16297] Lie. 1893.

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— *v. Curves, Groups of. Invariants.*

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— *v. Substitutions, Theory of.*

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GUANO: [3201. 12427] Nesbit. 1856.

GULDIN'S THEOREM: [3448-9. 12938] Pappus. 1588-1660.

GUN COTTON: [13907] Ransome. 1847.

— *v. Cordite. Pyroxylic Acid. Smokeless Powder.*

GUNNERY AND ARTILLERY: [418-20] Biringuccio. 1540-59. [765] Chasseloup-Laurat. 1811. [985] Decker. 1825. [1086-8] Douglas. 1829-60. [1126] Dupuget. 1771. [1130] Durtubie. 1795. [1407] Fraxno. 1847-8. [1679] Griffiths. 1856. [1684] Grobert. 1795-6. [2680] Lombard. 1787. [2691] Longridge. 1891. [2920] Mauvillon. 1788. [2955] Metcalfe. 1894. [3109] Morogues. 1737. [3387] Ordnance Notes. 1882-3. [3640] Piobert. 1852-9. [3735] Pomet. 1828. [3809] Projectiles. 1836. [4233] Scharnhorst. 1804-14. [4401-2] Simpson. 1792-1810. [4525] Spearman. 1828. [4628] Stone. 1645. [4746-9] Tartaglia. 1546-62. [4792] Tennent. 1864. [5037] Valturio. 1532. [5397] Whitworth. 1872. [6012] Barret. 1598. [6228-36] Biringuccio. 1540-1678. [6399] Boxer. 1860. [6460] Breithaupt. 1868. [6646] Busca. 1598. [6987-8] Collado. 1586-1641. [7342-4] Douglas. 1820-60. [7362] Dredge. 1892. [7428] Dyer. 1896. [7595] Erdmannsdorff. 1845. [8269] Garbett. 1897. [8637] Greenhill. 1895. [9290] Hime. 1904. [9491] Hotchkiss System. 1887. [9609-11] Hutton. 1786-1812. [9786] Jerminham. 1851. [10112] Kerigan. 1845. [10311] Krupp. 1879. [10643] Le Blond. 1766. [11094] Lloyd and Hadcock. 1893. [11004-5. 11008-9] Longridge. 1860-84. [11108] Lycoudis. 1896. [11192] Mackinlay. 1883. [11322-3] Mallet. 1856. [11799] Metcalfe. 1891. [11852] Migout and Bergery. 1849. [11954] Mittheilungen über Artillerie- und Genie-Wesen. 1871-9. [12018] Monge. 1794. [12064] Mordecai. 1860. [12134] Morgan. 1892. [12153] Morogues. 1737. [12270-1] Muller. 1757-68. [12380] Naval Artillery. 1890. [12712] Noble. 1906. [12749-50] Norton. 1868-80. [12756-7] Norton. 1628-43. [12829] Ordnance. 1904. [12830] Ordnance Manual. 1862. [12867] Overstraten. 1863. [12868] Owen. 1865-7. [12870] Owen. 1879. [12900] Paikhans. 1822. [12904] Palliser. 1863. [13351] Piobert. 1841. [13376] Place. 1889. [14387] Roerdansz. 1865. [14523] Roueroy. 1821-5. [14584] Russell. 1583. [14778] Scoffern. 1859. [14780-1] Scott. 1874-81. [14865-8] Simienowicz. 1651-1729. [15372] Vallier. 1899. [15373-4] Valturio. 1483-1532. [SS 2126] Venturi. 1815. [SS 2806] Malthus. 1650. [SS 2845-6] St.-Remy. 1707-41. [SS 2873] Thybourel. 1620.

— *v. Ballistics. Carriages (Military). Fuses.*

GUNPOWDER: [104] Anderson. 1862. [121] Antoni. 1789. [1407] Fraxno. 1847-8. [4746-9] Tartaglia. 1546-62. [5785] Antoni. 1773. [6437] Braddock. 1832. [7212] Debus. 1891. [7595] Erdmannsdorff. 1845. [9290] Hime.

GUNPOWDER, *continued*:

1904. [12065] Mordecai. 1845. [12270-1]  
Muller. 1757-68. [12717-18] Noble. 1875.  
[12825] Oppert. 1880. [14580] Rumford. c.  
1782. [14868] Simienowicz. 1676. [15418]  
Vossius. 1685. [SS 2711] Antoni. 1765.

— *v. Saltpetre.*

GUNTER'S LINES: [1716-19] Gunter. 1636-73.  
[3211] Neve. 1708. [8745-50] Gunter. 1636-80.  
[10814. 10816] Leybourn. 1676-98. [15589]  
Wingate. 1652. [SS 497] Henrion. 1626.

GUTTA PERCHA: [3357] Obach. 1898. [4790]  
Terry. 1907.

GYROSCOPE: [5509] Worms. 1862. [16940]  
Barnard. 1872. [16993] Clauzel. 1912.  
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1878. [S 1822] Cordeiro. 1913.

— *v. Spinning Top.*

HAIL, THEORY OF: [11338] Manchester Literary and  
Philosophical Society. 1785. [12316] Murray.  
1830.

HALOS AND CORONÆ: [570] Bravais. 1847.  
[SS 1601] Chesnecephorus. 1593.

HARBOUR WORKS: [2536] Leith Harbour. 1822.  
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Thunberg. 1776. [5057] Vernon-Harcourt.  
1885. [5968] Balzaretii. 1877. [8899] Harbour  
and Dock Works. 1878. [10559] Latham.  
1903. [11515] Martin. 1839. [12719] Noel.  
1781. [13543] Ports Maritimes. 1874-92.  
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Rogers. 1807. [14908. 14913-15. 14926.  
14928-30] Smeaton. 1767-1814. [15073-4]  
Stevenson. 1864.

— *v. Docks. Lighthouses.*

HARMONICS (SPHERICAL)—*v. Functions (Harmonic).*

HEAT (ANIMAL): [894] Crawford. 1788

— (ATMOSPHERIC)—*v. Temperature (Atmospheric).*

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Mariotte. 1717-40. [11723] Melloni. c. 1850.  
[13630-1. 13635] Prévost. 1809-32.

— *v. Radiation (Terrestrial).*

— (SOLAR): [10484-5] Langley. 1884. [14847]  
Siemens. 1883.

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Tyndall. 1861-2.

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—, ANALYTICAL THEORY OF—*v. Thermodynamics*  
(Analytical).

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Carlaw. 1906. [S 1880] Forbes. 1862-5.  
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— *v. Metals, Thermal Conductivity of. Recales-*  
*cence Curves.*

HEAT, DYNAMICAL THEORY OF—*v. Thermo-*  
*dynamics.*

—, ELEMENTARY WORKS ON: [2235-6] Kelland.  
1837. [2464-5] Lardner. 1837. [3379] Oken.  
1808. [4592-3] Stewart. 1871-88. [4839]  
Thomson. 1830. [7457] Edser. 1899. [8471]  
Glazebrook. 1894. [10034] Kelland. 1837.  
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1830. [17137-8] Maxwell. 1891-1902.

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1791-2. [SS 1477-81] Accademia del Cimento.  
1667-91. [SS 2617] Scheele. 1781.

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1898. [3520] Pécelet. 1878. [3761] Preston.  
1894. [9473] Hospitalier. *v. y.* [10062] Kelvin.  
1880. [13589] Poynting and Thomson. 1904.  
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Thomson. 1904. [S 2350] Tait. 1884.

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1835-7.

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holtz. 1847. [9919. 9921. 9924-5] Joule.  
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Rankine. 1863-81. [14537] Rowland. 1880.  
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[S 2023] Joule. 1879.

— *v. Energy, Conservation of.*

—, MEMOIRS ON: [4136] Rumford. 1804.  
[14845] Siemens. 1889.

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—, PRACTICAL TREATISES ON: [6398] Box. 1876.  
[9067-8] Heat. 1885.

—, PROBLEMS AND EXAMPLES: [S 2379] Turner.  
1885.

—, PROPAGATION OF: [2563-4] Leslie. 1804.  
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1877. [17181] Poincaré. 1895. [SS 1600]  
Chatelet-Lomont. 1744.

—, REFRACTION OF: [8016] Forbes. 1835.

—, REPULSIVE POWER OF: [13573] Powell. 1834.

—, THEORIES OF: [2563-4] Leslie. 1804. [2784]  
Major. 1891. [2817] Marat. 1780. [4407]  
Simpson. 1675. [6310] Bompas. 1817. [8874]  
Hands. 1879. [9431] Hooke. 1665. [9503]  
Hovenden. 1894. [10033] Keir. 1807. [10878]  
Link. 1795-7. [11389-91] Marat. 1780-2.  
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[13630-1. 13637] Prévost. 1792-1809. [13692]  
Proclus. 1825. [14107] Resta. 1786. [14577-9]  
Rumford. 1797-1802. [14810] Seguin. 1865.  
[15498] Wedgwood. 1791-2. [15514] West-  
rumb. 1785-7. [SS 1583-4] Boyle. 1675-6.  
[SS 1600] Chatelet-Lomont. 1744. [SS 2307]  
Magellan. 1780. [SS 2467-8] Curiosities in  
Chemistry. 1691.

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Reade. 1818. [14803] Sedgwick. 1882.  
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[SS 2016] Rabiqueau. 1753.

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1850-1.

—, ABSORBED IN CHEMICAL DECOMPOSITIONS:  
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1910.

- HEAT OF EVAPORATION: [14208] Richards and Mathews. 1911. [SS 2020] Regnault. 1847.
- HEATING—*v.* *Ventilation and Heating.*
- OF BODIES: [SS 2316] Martine. 1792.
- HELICOIDAL APPARATUS: [16295] Leroy. 1890.
- HELIOCHROMY: [7380] Ducos du Hauron. 1874.
- HELIOMETER: [7066] Crawford. 1876–85.
- HELIUM: [3137] Mugdan. 1896. [15109] Stoney. 1897.
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- HIGH VACUA, PHYSICS OF: [903] Crookes. 1879.
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- *v.* *Accounting, H. of. Aerial Navigation, H. of. Algebra, H. of. Arithmetic, H. of. Astronomy, H. of. Attraction, H. of. Theory of. Calculus of Variations, H. of. Chaldean Science. Chemistry, H. of. Civil Engineering, H. of. Coal Mining, H. of. Compass (Mariner's), H. of. Discoveries and Inventions. Distillation, H. of. Elasticity, H. of. the Theory of. Electricity, H. of. Elements (Chemical), H. of. Engineering, H. of. Ether Theories, H. of. Geology, H. of. Geometry, H. of. Horology, H. of. Machinery (Early). Magnetism, H. of. Mathematics, H. of. Mechanics, H. of. Meteorology, H. of. Microscope, H. of. the. Mining, H. of. Optics, H. of. Photography, H. of. Physics, H. of. Railways, H. of. Shipbuilding, H. of. Steam Engine, H. of. Steam Engines (Early). Steam Navigation, H. of. Telegraphy (Electric), H. of. Telescope, Early Works on the. Thermodynamics, H. of.*
- HOISTING MACHINERY: [8481] Glynn. 1873. [15502] Weisbach and Hermann. 1893. [S 3403–4] Colyer. 1881–92.
- *v.* *Cranes.*
- HORARY TABLES: [11143] Lynn. 1827. [15251] Thomson. 1867.
- HORIZON (ARTIFICIAL): [11509] Martin. *n.d.*
- HORIZONTAL INSTRUMENT (OUGHTRED'S): [3407] Oughtred. 1633.
- HOROLOGY: [599] Britten. 1894. [703] Carpenter. 1857. [828–9] Clockmakers' Co. 1825–81. [913] Cumming. 1766. [1015–16] Derham. 1734. [1426] Frodsham. 1862. [1571] Glasgow. 1885. [1682] Grimthorpe. 1860. [1687] Grossman. 1880. [1995] Horological Journal. 1858–1900. [2461] Lardner. c. 1850. [2545] Lenormand. 1876. [2866] Martinelli. 1669. [3026] Moinet. 1875. [3199] Nelthropp. 1873. [3575–6] Philippe. 1863–78. [3944–8] Reid. 1826–59. [4029] Robert. 1849. [4217–18] Saunier. 1872–81. [4410] Sire. 1870. [4682] Sully. 1717. [4821] Thomson. 1842. [5235] Watchmaker. 1877–85. [5480] Wood. 1866. [6168–72] Berthoud. 1773–1811. [6515] Britten. 1884. [6661] Cagnoli. 1787. [6744–5] Carpenter. 1843–57. [7175] Dasypodius. 1580. [7861–2] Ferguson. 1778–90. [8465] Glasgow. 1885–93. [8704–5] Grimthorpe. 1850–7. [8957] Harrison. *n.d.* [9392] Holden. 1892. [11972–3] Moinet. 1841–75. [12417–18]
- HOROLOGY, *continued*:  
Nelthropp. 1873. [13292] Piazzini. 1798. [13510] Poppe. 1810. [13576] Powell. 1661. [14678–9] Saunier. 1882–91. [15420] Vulliamy. 1828–30. [S 90] Horlogerie, Journal Suisse de. 1880–6. [S 1377–8] Berthoud. 1787–1802. [S 2430] Yvon Villarceau. 1862. [SS 1360] Britten. 1899. [SS 1363] Camus. 1806. [SS 1374–5] Derham. 1696–1700. [SS 1405] Hatton. 1773. [SS 3042–3] Mandey and Moxon. 1696–9.
- *v.* *Chronometers. Clocks. Dialling. Dipleidoscope. Electric Clocks. Magnetic Clock. Pendulum. Teeth of Wheels. Thermochronometer. Watch Balances.*
- , HISTORY OF: [5480] Wood. 1866. [S 1377] Berthoud. 1802. [SS 1374] Derham. 1696.
- 'HORROR VACUI': [523. 537–41] Boyle. 1660–82. [3476] Pascal. 1663. [6424. 6429] Boyle. 1662–74. [8801] Hale. 1675. [9177–8] Hero Alexandrinus. 1589–1647.
- HOSPITAL CONSTRUCTION: [11210] Mackintosh. 1909. [12214] Mouat and Snell. 1883.
- HYDRATES: [9867. 9872–3] Jones. 1905–8.
- HYDRATING METHODS: [10384] Ladenburg. 1901.
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- ENGINEERING: [324] Bédior. 1737–53. [405] Billings. 1889. [747] Cessart. 1806–9. [2107] Jackson. 1885. [4325] Sempé. 1776. [5400] Wiebeking und Kröncke. 1798–1807. [6045] Pateman. 1884. [6105] Bédior. 1737–53. [7996] Fontana. 1696. [8432] Gilly und Eytelwein. 1809. [8735] Guglielmini. 1739. [8781] Hagen. 1869–70. [9658] Idraulici (Opuscoli). 1824. [9701] Jackson. 1885. [10610. 10612] Law and Bunnell. 1852–82. [10769] Leupold. 1724. [13733] Prony. 1790–6. [15144–5] Strukel. 1904. [S 3436] Fanning. 1906. [S 3447] Frizell. 1906. [S 3582] Raccolta (Nuova). 1823. [SS 3064] Raccolta. 1821. [SS 3069] Schuler. 1622.
- *v.* *Caissons. Drainage. Fascine Works. Harbour Works. Irrigation. Pile Driving Engines. Water Supply E. Waterworks.*
- EXPERIMENTS: [299] Beaufoy. 1834. [666] Caligny. 1883. [4273] Schott. 1657. [6072–3] Beaufoy. 1834. [11830–1] Michelotti. 1767–71. [14143] Reynolds. 1883. [S 3414] Cunningham. 1880–1.
- MOTORS AND MACHINERY: [666] Caligny. 1883. [1268] Ewbank. 1870. [1270] Fabre. 1783. [6287] Bodmer. 1895. [6684] Cambray-Digny. 1766. [7403] Dunkerley. 1907. [7724–5] Ewbank. 1851–70. [10414] La Hire. 1695. [10768] Leupold. 1724. [14356] Robinson. 1893. [15501] Weisbach. 1882. [S 3359] Björling. 1894.
- *v.* *Fire Engines. Pressing Machinery. Pumps. Turbines (Water). Water-raising Machinery. Water Wheels.*
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- TABLES: [3212] Neville. 1860–1. [6065–6] Beardmore. 1852. [7484] Ekin. 1908. [8273] Garrett. 1909. [9697–8] Jackson. 1875–83. [12453–4] Neville. 1853–61. [13734] Prony. 1825. [S 3694] Williams and Hazen. 1911.
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- *v. Liquids, Resistance of.*
- HYDRINDONE:** [10154] Kipping. 1894.
- HYDROCARBONS:** [1288. 7769] Faraday. 1859. [12790] Odling. 1855.
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- ICE:** [4977] Tyndall. 1872-85. [10411-12] La Hire. 1694. [11305-6] Mairan. 1749-56. [11430-3] Mariotte. 1717-40.
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- INCLINATIONS, PROBLEM OF: [127. 129] Apollonius. 1770. [5795. 5799-5800] Apollonius. 1607-1779.
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- INVENTIONS—*v. Discoveries.*
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Hirzgarter. 1643. [SS 1375] Derham. 1700.
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[12429] Netto. 1843.
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1609-19.
- PROBLEM: [8454] Glaisher. 1877. [9517]  
Howe. *n.d.*
- KERAMIC INDUSTRIES—*v. Pottery.*
- KINEMATICS: [320] Bélanger. 1864. [844] Collignon.  
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Boeddicker. 1876
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1668. [SS 2728] Buonanni. 1786.
- *v. Japanning. Varnishes.*
- LACTIC ACID: [14697] Scheele. 1786.
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26. [S 1937] Gilbert. 1884.
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- LAMPS (ANCIENT): [10823] Liceti. 1621.
- (PERPETUAL): [13291] Phosphorus. *c.* 1720.
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1677.
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1780-9.
- LATHES—*v. Turning.*
- LATITUDE, DETERMINATION OF: [2482] Latitude.  
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Rossel. 1815. [14493] Rosser. 1862. [S 1349]  
Albrecht und Wanach. 1903-6.
- *v. Polar Heights.*
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- **CLOCK** : [SS 1835] Léotaud. 1668.
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- **FIELD**—*v. Electromagnetic Field of Force*.
- **INDUCTION**—*v. Electromagnetic Induction*.
- **INFLUENCE OF SOLAR RAYS** : [6877] Christie. 1826.
- **INSTRUMENTS** : [14237] Riddell. 1844.
- **MEASUREMENT** : [9480] Hospitalier. *v. y.* [14410] Roller. 1907. [S 2408] Weber. 1853.
- **MEDIA** : [9321] Hirst. 1855.
- **NEEDLE** : [1314] Fenwick. 1822. [6126] Bennet. 1792. [7830] Fenwick. 1861. [10880] Lintern. 1887. [15180-1] Swinden. 1784.
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- **TABLES** : [6298] Boileau. 1850. [15434] Walker. 1794.
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- (POPULAR)—*v. Electricity and Magnetism (Popular)*.
- (PRACTICAL)—*v. Electricity and Magnetism (Practical)*.
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- : PARADOXES: [6924] Clarke. 1818. [15047-8] Stevenson. 1846-9. [SS 2000] Peart. 1791.
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- AND ELECTRICITY COMPARED: [13171] Peletin. 1802. [15180-1] Swinden. 1784. [SS 1484, 1486] Aepinus. 1758. [SS 1592-4] Cabeo. 1629.
- OF CRYSTALS: [13436] Plücker. 1854.
- OF GASES: [13436] Plücker. 1854.
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- OF METALS: [7773] Faraday. 1839. [14795] Seebeck. 1828.
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- *v. Turbines (Steam).*
- MARS (PLANET): [1359] Fontana. 1646. [3584] Phillips. 1865. [5684] Airy. 1858. [6596] Bugge. 1789. [7999-8001] Fontana. 1646. [10863] Lindenau. 1811. [11050-1] Lowell. 1896. [12680] Niesten. 1878. [S 1527] Lowell. 1908. [SS 1134] Hirtzgarer. 1643.
- *v. Atmospheres (Planetary).*
- MARSH GAS—*v. Methane.*
- MASONRY CONSTRUCTION: [246] Baker. 1890. [7316-17] Dobson. 1849.
- MAST MAKING: [7900] Fincham. 1829. [8034-5] Forfait. 1788. [11553] Masts. 1797.
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 Vossius. 1650.  
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 Variations*, H. of. *Geometry*, H. of. *Mechanics*,  
 H. of. *Probabilities*, *Theory of*, H. of. the.  
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*Arithmetic*, P. and E. of. *Arithmetic*, *Psychology*  
*of*. *Calculation*, *Principles of*. *Calculus*, *Philos-*  
*ophical Principles of*. *Geometry*, *Axioms of*.  
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 Boyle. 1668. [10789-90] Lewis. 1763. [17013]  
 Duhem. 1891.  
 — v. *Boiling Point*, *Colloidal State*, *Crystalloid  
 State*, *Electrotonic State*, *Evaporation*, *Freezing  
 Point*, *Phase Rule*, *Solid State*, *Spheruloid  
 State*, *State*, *Change of*, *Vaporization*, *Volat-*  
*ilization*.  
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*Electron Theory*. *Vortex Theory*.  
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 MAXIMA AND MINIMA: [895] Cresswell. 1817.  
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 Simpson. 1747-60. [15513] West. 1762.  
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*Electromagnetic Theory of*.  
 MEANS (ARITHMETICO-GEOMETRICAL): [SS 230]  
 Borchard. 1888.  
 — v. *Arithmetical Means*.  
 MEASURES (STANDARD): [5396] Whitworth. 1858.  
 [S 3687] Whitworth. 1872.  
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MEASURING (TECHNICAL): [8571] Gramberg. 1905.

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— *v. Balance. Bathometer. Dynamometer. Gauging Rod. Goniometer. Hydraulic Current Meter. Hydrostatic Balance. Instruments of Precision. Micrometer. Pedometer. Saccharometer. Sensitometry. Tachometry. Telemeter.*

MECHANICAL DRAWING — *v. Machine Drawing.*

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— *v. Machinery. Planes (True).*

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MECHANICS (ELEMENTARY), *continued:*

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— *v. Machinery, M. of.*

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MECHANICS (RATIONAL), *continued* :

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- MERCANTILE TABLES : [3483-4] Pasi, 1521-40. [4724] Tagliente, 1570. [5706] Aleiatio, 1532. [6026] Bartoli, 1866. [8134] Frazioni Decimali, 1811. [8268] Garatti, 1686. [11380] Manzoni, 1553. [11425] Mariani, 1567. [11541] Maskelyne, 1800. [12834] Oriani, 1801. [13000] Pasi, 1503. [13020] Pathway of Knowledge, 1596.
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- , WORKING OF : [S 3217] Demuth, 1907

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Daniell. 1823-45. [8828-30] Halley. 1708-27.  
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Saussure. 1796-1803. [15299] Toaldo. 1802.  
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1782.
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Gauge. Thermometry.*
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MINING, *continued*:

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*Rigging. Sailing Directions. Sailmaking. Ships.*  
*Speed Measurement of.*  
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 Hartsoeker. 1722. [12606] Horne. 1753.  
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 Pemberton. 1728. [12625] Voltaire. 1738.  
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 Newton. 1687-1880. [12597] Brougham and  
 Routh. 1855. [12600] Domcke. 1730.  
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 Pemberton. 1728. [12622] Rigaud. 1838.  
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 Krüger. 1891.  
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 Mersenne. 1644-7.  
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- PERMUTATIONS—*v. Combinations and P.*
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**PHAKOLITE:** [5760] Anderson. 1842.  
**PHASE RULE:** [2860] Martin. 1905. [4070] Roozeboom. 1901-4. [7902] Findlay. 1904.  
 — *v. Chemical Equilibrium.*  
**PHENOL:** [6683] Calvert. 1867. [8162] Fritzsche. 1857. [12782] Odermatt. 1878.  
 — *v. Picric Acid.*  
**PHENOMENA (NATURAL):** [6245] Black. 1906. [10237] Knoll. 1786-8. [13799] Quetelet. 1835. [14808] Seguin. 1861.  
**PHILOSOPHY AND PRINCIPLES OF EXACT SCIENCE:**  
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 — *v. Action at a Distance. Algebra, E. and P. of Analytical Theorems. Arithmetic, P. and E. of Astronomy, P. of Calculus, P. of Causality. Classification of S. Correlation (Physical). Continuity. Descartes and Newton reconciled. Free Will. Geometry, Axioms and Hypotheses of Geometry, Elements and Principles of Horror Vacui. Infinity. Logic of S. Mathematics, P. and Principles of Matter, Theories of Mechanics, P. and E. of Physics, Principles of Relativity, Theory of Space. Universal Science.*  
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 — *v. Chemistry (Phlogistic).*  
**PHONETICS, MECHANISM OF:** [1857] Helmholtz. 1667. [SS 1816] Kempelen. 1791.  
**PHONOGRAPH:** [3760] Prescott. 1878. [8680-1] Gretschel. 1878-83. [15516] Wheatstone. 1879.  
**PHOSPHATES:** [4516] Sorel. 1902. [7181] Daubrée. 1868. [8554. 8558-9] Graham. 1833-7. [13604] Pratt. 1868.  
**PHOSPHIDE OF SODIUM, CHEMICAL ACTION OF:** [10756] Letts and Collie. 1881.  
**PHOSPHINES:** [S 2782-3] Hofmann. 1861.  
**PHOSPHORESCENCE:** [3160] Murray. 1826. [3606] Phipson. 1862. [5437] Wilson. 1775. [6088] Becquerel. 1867-8. [10190] Klatt und Lenard. 1889. [11590] Matteucci. 1847. [12313] Murray. 1826. [13094] Penny. 1855. [13259. 13266-7] Phipson. 1858-75. [13291] Phosphorus. c. 1720. [13676] Pring. 1850. [15572] Wilson. 1775. [S 2618] Beccari. 1768.  
**PHOSPHORESCENT SULPHIDES:** [10720] Lenard etc. 1909.  
**PHOSPHORUS AND ITS COMPOUNDS:** [4523] Spallanzani. 1796. [5437] Wilson. 1775. [6407-9] Boyle. 1680-2. [11419] Marggraf. 1767-8. [12055] Moore and Zepharovich. 1885. [13270] Phipson. 1856. [13291] Phosphorus. c. 1720. [13640] Prideaux. 1911. [14474] Rose. 1833. [14585] Russell. 1903. [15289-90] Thorpe and Tutton. 1890-2. [15572] Wilson. 1775. [S 2618] Beccari. 1768.  
 — *v. Calcium Phosphide. Hypophosphites.*  
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**PHOTOGENIC DRAWING:** [15201] Talbot. 1839.  
**PHOTOGRAPHIC CHEMICALS:** [2509] Leaper. 1891.  
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 — *v. Bromine P. Calotype. Collodion P. Daguerrotype. Emulsion P. Ferrotype. Heliochromy. Photogenic Drawing. Photogravure. Photolithography. Platinotype. Retouching. Silver Printing. Telautography.*  
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- *v. Actinic Rays. Camera Obscura. Chemistry (Photographic). Colour P. Daguerreotype. Electricity (Photo-). Optics (Photographic). Photogenic Drawing. Retouching. Telautography. Telephotography.*
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- , CHEMISTRY OF—*v. Chemistry (Photographic).*
- , HISTORY OF: [9572-3] Hunt. 1844-54. [10309] Krüger. 1858.

PHOTOGRAVURE: [1008] Denison. 1894.

PHOTOLITHOGRAPHY: [SS 2697] Belloc. 1855.

PHOTOMETRY: [494, 498] Bouguer. 1729-60. [610] Brown. 1883. [1041] Dibdin. 1889. [1803] Hartley. 1879. [2404] Lambert. 1760. [2707] Lovibond. 1893. [3437] Pilaz. 1894. [4131] Rumford. 1794. [6100] Beer. 1854. [6109] Bell. 1902. [6366-7] Bouguer. 1729. [6340] Brown. 1883. [7097] Crookes. 1868. [7279] Dibdin. 1889. [8192] Fyfe. 1842. [10097] Kepler. 1604. [10424] Lambert. 1760. [11041] Lovibond. 1893. [13306] Pickering. 1882. [14144] Reynolds. 1876.

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— *v. Units.*

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PHYSICS (AGRICULTURAL): [6392] Boussingault. 1843-4. [10141] King. 1878. [15445] Wallerius. 1766.

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PHYSICS (ARISTOTELIAN), *continued*:

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— *v. Photography.*
- REVOLVER: [5779] Anquetil. 1854-5.
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— *v. Sailmaking.*
- RING (MATHEMATICAL): [992] Delamaine. 1630.
- RIPPLES: [7971] Fleming. 1902. [9323] Hirst. 1861.
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— *v. Lakes, O. of. Springs, O. of.*
- ROAD MAKING: [3994] Richardson. 1905. [6378] Boulnois. 1895. [6648] Byrne. 1892. [7418] Durand-Claye et Mars. 1885. [7454] Edgeworth. 1813. [7947] Flachet-Mony et Bonnet. 1835. [8395] Gillespie. 1874. [8438] Gilmore. 1876. [8929] Harris and Wakelam. 1909. [9419] Homer. 1767. [10559] Latham. 1903. [10611-12] Law and Burnell. 1850-82. [11151-4] McAdam. 1820-3. [11326] Malo. 1886. [12398-9. 12402] Navier. 1830-3. [13483] Polonceau. 1844. [14944] Smith. 1909. [15070] Stevenson. 1824. [SS 2983-4] Congleton. 1833. [SS 2992] Edgeworth. 1817. [SS 3003] Fry. 1820.  
— *v. Asphalt. Gates and Wickets.*  
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- ROCKETS AND ROCKET APPARATUS: [11335] Manby. 1812. [12030] Montgéry. 1826. [12058] Moore. 1813. [S 3730-1] Congreve. 1814-27.  
ROCKS—*v. Lithology.*  
— (VOLCANIC): [8910] Harker. 1889.  
—, FOLIATION OF: [8002] Forbes. 1855.
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- ROOTS (MATHEMATICAL): [722] Cataldi. 1613. [8334] Gemma. 1567. [10921] Lobatto. 1842. [10939] Lockhart. 1821. [13293] Picard. 1692. [16223] Kleyer. 1883. [SS 222] Beyer. 1603.  
— (SQUARE AND CUBE), TABLES OF: [2182] Joncourt. 1762. [5898-9] Babington. 1635. [9721] Jahn. c. 1845. [SS 224] Boebert. 1812.
- ROPE MAKING: [9525] Huddart. 1815.
- ROSOLIC ACID: [14946] Smith. 1857.
- ROTATION—*v. Motion (Rotary).*  
— APPARATUS: [9091] Heinen. 1857.  
— *v. Polytrope.*
- ROULETTES, GEOMETRY OF: [381. 6191. 16956] Besant. 1870-90.
- ROYAL SOCIETY OF LONDON: [199] Babbage. 1830. [417] Birch. 1756. [4546] Spratt. 1734. [4838] Thomson. 1812. [5314-15] Weld. 1848-60. [5893] Babbage. 1830. [6016] Barrow. 1849. [6237] Birch. 1757. [7716] Everest. 1839. [8293] Gassiot. 1870. [8582] Granville. 1836. [9288] Hill. 1780. [9533] Huggins. 1906. [14548-56] Royal Society of London. 1784-1901. [15276] Thomson. 1812.
- RULE (CARPENTER'S): [1055] Digges. 1625. [6205] Bevan. 1832. [14732-3] Schoner. 1614. [S 647-50] Digges. 1556-1656.  
— *v. Slide Rule.*  
— OF PROPORTION: [15597] Wingate. 1645. [16456-7] Olbricht. 1891-3.
- SACCHARIC ACID: [15514] Westrumb. 1785-7.
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— *v. Sugar.*
- SAFETY LAMP (MINER'S): [977] Davy. 1825. [7203] Davy. 1818. [12485] Newman. 1835. [15036] Stephenson. 1817. [S 3214] Davy. 1816.
- SAILING DIRECTIONS: [12726] Norie. 1829. [13375] Pilot. 1743. [14342] Robertson. 1855.
- SAILMAKING: [1370] Forfait. 1780. [6825] Chapman 1794. [10158] Kipping. 1851. [14630] Sail-Making. 1796. [SS 3158] Heathcote. 1824.  
— *v. Rigging of Ships.*
- SAL AMMONIAC: [8564] Götting. 1782. [11957] Model. 1758.
- SALT WORKS: [6547] Brownrigg. 1748. [6684] Cambay-Digny. 1766. [7399] Dundonald. 1785. [7825] Fehling. 1847.
- SALTNESS OF THE SEA: [555. 6430-1] Boyle. 1674-90. [14437] Rosaccio. 1604.
- SALTPETRE: [6374] Botté de Toulmon et Riffault des Hêtres. 1813. [6404-6] Boyle. 1661-9. [11834] Mignot de Montigny. 1776. [14868] Simienowicz. 1676. [15485. 15487] Weber. 1779-80. [S 2687] Clarke. 1670. [SS 2611] Reuss. 1783-6.  
— *v. Ammonia and its Compounds. Gunpowder. Nitrates.*
- SALTS (CRYSTALLIZED), DEHYDRATION OF: [14184] Richards. 1897.  
—, THEORY OF: [1567] Glauber. 1659. [4329] Sendivogius. 1669-71. [6384] Bourguet. 1762. [10247] Koene. 1854. [11361] Mansfield. 1865. [12789] Odling. 1860. [14223] Richardson and Watts. 1863-7. [15009-10] Stahl. 1723-71. [15192-3] Tachen. 1669-71. [15396] Vigenère. 1642.
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 — *v. Bacterial Decomposition. Disinfectants. Plumbing. Sewage Disposal. Sewer Gas. Smoke Abatement. Ventilation.*
- SATURN (PLANET) : [999] Delambre. 1810. [2062] Huygens. 1659. [3828] Proctor. 1905. [3516-17] Wright. 1750. [6597] Bugge. 1786. [9204. 9206-8] Herschel. 1790-4. [11629] Maupertuis. 1742. [11673] Maxwell. 1859. [12857] Oudemans. 1888. [13715-16] Proctor. 1865-82. [SS 1054-5] Cysat. 1619. [SS 1060] Dionis du Séjour. 1776.
- SCALE (DIAGONAL) : [SS 1370] Collins. 1710.  
 — (GUNTER'S) : [1716-19] Gunter. 1636-73. [8745-50] Gunter. 1636-80.  
 — (MATHEMATICAL) : [14990-1] Speidell. 1616-17.  
 — (PLANE) : [4610] Stirrup. 1651. [13954] Rea. 1717. [15098] Stone. 1728. [SS 3138] Collins. 1659.  
 — *v. Sector.*
- SCALES OF EQUAL PARTS : [1973. 9411-12] Holtz-appfel. 1838.
- SCENERY, GEOLOGICAL CAUSES OF : [11209] Mackintosh. 1909.
- SCIENCE (NEW) : [3616] Picard. 1905. [15636] Duncan. 1909. [17042] Gibson. 1909.  
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 — CUTTING TABLES : [7065] Crawford. 1878.  
 — PROPELLER AND PROPULSION : [508] Bourne. 1867. [4571] Steam Navigation. 1858. [6385-6] Bourne. 1855-67. [6618] Burgh. 1869. [7402] Dunkerley. 1907-8. [8172] Froude. 1877 [9684] Isherwood. 1859. [10145] King. 1875. [10242] Knowles. 1871. [12768] Nystrom. 1852. [12946] Paris. 1855. [13034] Peabody. 1912. [13890] Rankine. 1881. [13937] Rawson. 1851. [14790] Seaton. 1909. [17337] Dreihardt. 1906. [17356] Taylor. 1907.  
 — THREADS : [5396] Whitworth. 1858. [9773] Jeffcott. 1907. [S 3687] Whittaker. 1882.
- SCREWS, THEORY OF : [5962] Ball. 1876. [16937] Ball. 1900.
- SEA-BREEZE : [962] Davis. 1890.
- SEAMANSHIP—*v. Navigation.*
- SEARCHLIGHTS : [12421] Nerz. 1907.
- SECRETS (SCIENTIFIC) : [3711-12] Porta. 1585-1644. [5296-7] Wecker. 1651-60. [13517-24] Porta. 1558-1658. [15496] Wecker. 1662. [SS 30] Bate. 1631. [SS 66] Fioravanti. 1564. [SS 128-31] Porta. 1558-60.  
 — *v. Chemical Secrets. Steel Manufacture, S. of.*
- SECTION (GEOMETRICAL) : [128] Apollonius Pergæus. 1706. [5796-9] Apollonius Pergæus. 1706-73. [14958] Snell. 1608.  
 — (GOLDEN) : [3568] Pfeifer. 1885.
- SECTOR : [1716-19] Gunter. 1636-73. [3067] Moore. 1673. [8745-50] Gunter. 1636-80. [13954] Rea. 1717. [14338-41] Robertson. 1747-75. [15098] Stone. 1728. [S 764-5] Gunter. 1623.  
 — *v. Scale (Plane).*
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 — *v. Volcanology.*
- SELENIUM AND ITS COMPOUNDS : [11951-3] Mitscherlich. 1834-47.
- SEMAPHORE—*v. Signalling.*
- SENSITOMETRY : [11713] Mees and Sheppard. 1904.
- SERIES : [2690] Longfield. 1872. [3030] Moivre. 1730. [3988\*] Riccati. 1756. [4754-5] Tate. 1845. [10461] Landen. 1781-3. [11024-5] Lorgna. 1779. [11989-91] Moivre. 1750. [12128] Morgan. 1865. [13487] Poncelet. 1833. [15852] Catalan. 1860. [16057] Godefroy. 1903. [16542] Kunze. 1904.  
 — *v. Binomial Theorem. Differential Method.*  
 — (FOURIER'S) : [653] Byerly. 1893. [1388] Fourier. 1822. [8068] Fourier. 1878. [8496] Godfrey. 1900. [15824] Byerly. 1893. [15846] Carslaw. 1906. [16145] Hobson. 1907.  
 — (GAUSS'S) : [14242] Riemann. 1857. [SS 69] Gauss. 1870-1906.  
 — (INFINITE) : [352] Bernoulli (Jacques). 1713. [5011] Boulliau. 1682. [1169] Emerson. 1767. [1254] Euler. 1797. [1616. 1618. 1622-3] Grandi. 1699-1713. [1629] Gravesande. 1727. [4781] Taylor. 1823. [5082] Vince. 1791. [5184-5] Wallis. 1657. [5224] Waring. 1791. [6149-50] Bernoulli (Jacques). 1713. [9609] Hutton. 1786. [12579-83] Newton. 1736-40. [13845-6] Raphson. 1702. [15805-6] Bromwich. 1908. [16439] Nielsen. 1909. [16783] Whittaker. 1902. [S 1041] Newton. 1737.  
 —, SUMMATIONS OF : [4607] Stirling. 1764. [5504] Woolhouse. 1865. [14880] Simpson. 1743. [15087-90] Stirling. 1730-64.  
 — (LAGRANGE'S) : [14508] Rouché. 1861. [S 1081] Pfaff. 1797.  
 — (SELF-REPEATING) : [5209] Warburton. 1854.  
 — (TRIGONOMETRICAL) : [10919] Lobatto. 1827. [15721] Beau. 1885. [16281] Lebesque. 1906.
- SEWAGE ANALYSIS : [8073] Fowler. 1902.  
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 Robinson. 1882-96. [15460] Waring. 1891.  
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 1893.  
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 tary Engineering.*
- SEWER GAS: [3983] Reynolds. 1876. [14147]  
 Reynolds. 1872. [14385] Roechling. 1898.
- SEWING MACHINERY: [5028] Urquhart. 1881.
- SEXAGESIMAL TABLES: [4776] Taylor. 1780. [6154]  
 Bernoulli (Jean). 1779.  
 — *v. Logarithms (Logistic).*
- SEXTANT: [1729-31] Hadley. 1750-61. [2776]  
 Magnaghi. 1875. [3637] Pinar. 1867-95.  
 [5742] Amici. 1836. [8778] Hadley. c. 1750.  
 [11070] Ludlam. 1790. [11275] Magellan.  
 1775. [11477] Martin. *n.d.* [12722] Norie.  
 1796. [14536] Rowland. 1834. [SS 1837-8]  
 Lambert. 1769.  
 — *v. Quadrant.*
- SHEDS (STEEL-FRAMED): [S 3615] Spencer. 1915.
- SHEFFIELD SCIENTIFIC SCHOOL [U.S.A.]: [11034]  
 Lounsbury. 1879.
- SHIPBUILDING: [497] Bouguer. 1746. [757]  
 Chapman. 1781. [1257] Euler. 1749. [1737]  
 Hale. 1691. [1915] Heywood. 1637. [2352]  
 Lacroix. 1775. [2736] Lutschauing. 1885.  
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 Pollock. 1884-1905. [3909] Read. 1847.  
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 1866. [4553] Stalkart. 1781. [5390] White.  
 1882. [5454] Witsen. 1671. [5837] Art de Bâtir.  
 1719. [6251] Blackburn. 1836. [6370-1]  
 Bouguer. 1746. [6754] Carson. 1880. [6824]  
 Chapman. 1781. [7356] Doyère. 1895. [7388-  
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 Fincham. 1821-52. [7923] Fishbourne. 1874.  
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 Lacroix. 1775. [10733-4] Lescallier. 1791.  
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 Murray (A.). 1861-3. [12317] Murray (M.).  
 1765. [12374-9] Naval Architecture. 1792-  
 1865. [12967] Parkin. c. 1800. [12992]  
 Partington. 1826. [13481] Pollard et Dubebout.  
 1890-4. [13987] Reed. 1869. [14032-3.  
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 und Halle. 1902. [14780-1] Scott. 1874-81.  
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 Vade-mecum. 1805. [15172-3] Sutherland.  
 1717-29. [15232] Thevenard. 1800. [15344]  
 Tupinier. 1830. [17360] White. 1894. [S 3738].  
 Engineering Congress. 1894. [S 3753] Griffiths.  
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 1917. [SS 3127] Blackburn. 1817. [SS 3154]  
 Griffiths. 1856. [SS 3161] Knowles. 1822.  
 [SS 3202] Sutherland. 1784. [SS 3331] Ship-  
 builder. 1906-18.  
 — *v. Anchor. Copper Sheathing. Life-Boats.  
 Marine Engineering. Mast-making. Rigging.  
 Sailmaking. Tonnage. Ventilation of Ships.  
 Warships. Yachts.*
- , HISTORY OF: [7896-8] Fincham. 1851.  
 [14426] Rondelet. 1820.
- SHIP'S LIGHTS: [10095] Kenward. 1893.
- SHIPS (IRON): [1275] Fairbairn. 1865. [3925] Reed.  
 1869. [7754] Fairbairn. 1865. [7986] Foden.
- SHIPS (IRON), *continued*:  
 1900. [8294] Gatewood. 1886. [12900]  
 Paixhans. 1822. [12945] Paris. 1863.  
 — *v. Warships.*  
 — (SAILING): [3427\*] Ozanne. c. 1780. [10349]  
 Laas. 1908.  
 — (UNSAKABLE): [6695] Campbell. 1873. [15463]  
 Watson. 1827. [15539] White. 1677.  
 —, ELECTRIC INSTALLATIONS ON: [14386] Roedder.  
 1903.  
 — *v. Electric Ships.*  
 —, RAISING OF SUNKEN: [2999] Milne. 1828.  
 [4748-50] Tartaglia. 1746-54. [S 3839] Zusto.  
 1789.  
 —, RESISTANCE OF: [7402] Dunkerley. 1907-8.  
 [17356] Taylor. 1907.  
 —, RIGGING OF—*v. Rigging of S.*  
 —, ROLLING OF: [6177] Bertin. 1877-80.  
 —, SPEED MEASUREMENT OF: [4223] Savérien.  
 1750. [4422] Smeaton. 1754. [14899. 14916]  
 Smeaton. 1754-1814.  
 —, STABILITY OF: [5867] Atwood. 1796. [12201-  
 2] Moseley. 1843-55.  
 — OF ALL TIMES AND NATIONS: [873] Coronelli.  
 1687. [4484] Snell van Royen. 1624. [5916]  
 Baif. 1541. [12383-4] Naval Mobilization.  
 1889. [14716-17] Scheffer. 1654. [15418]  
 Vossius. 1685. [S 3795-6] Paris. 1841-84.  
 [SS 3143] Deslandes. 1768.
- SHIPS' BOATS: [6955] Clifford. 1855.  
 — BOTTOMS: [10862] Linden. 1750.  
 — *v. Copper Sheathing.*
- SIDEROSTAT: [13441-2. 13444] Plummer. 1901.
- SIGNALLING: [8263-4] Gamble. 1795-7.  
 — *v. Railway Signalling.*
- SILICATION: [10319] Kuhlmann. 1858.
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 Kipping. 1908. [S 2998] Asch. 1913.
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 1891. [14343-4] Robinet. 1843-56. [S 3117]  
 Paulet. 1763-89.  
 — (ARTIFICIAL): [S 3142] Süvern. 1900.  
 — FINISHING: [9566] Hurst. 1892.
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- SILOS: [13559] Potter. 1886.
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 1839-72.
- SILVER, METALLURGY OF: [478] Born. 1791. [2338]  
 Küstel. 1868. [3589] Phillips. 1867. [4679]  
 Suess. 1893. [6339-42] Born. 1786-91.  
 [7469] Egleston. 1887-90. [13229] Phillips.  
 1867. [3165-7] Barba, 1738-40. [S 3201-2]  
 Collins. 1899-1900. [SS 2883] Barba. 1674.  
 — *v. Assaying.*  
 —, POROSITY OF: [SS 1477-81] Accademia del  
 Cimento. 1667-91.  
 — PRINTING: [5625] Abney and Robinson. 1881.  
 [5849] Ashman. 1888. [10854] Liesegang.  
 1881.  
 — *v. Photographic Processes.*
- SINGULAR SOLUTIONS: [2374. 10397] Lagrange.  
 1806. [16095] Leibniz. 1768. [11265] Madison.  
 1898. [16189] Johnson. 1910. [S 621] Darboux.  
 1883.  
 — *v. Equations (Differential). Equations (Partial  
 Differential).*
- SLIDE RULE: [386] Bevan. 1822. [837-8] Cogges-  
 hall. 1729-85. [1379] Foster. 1652. [1716-19]  
 Gunter. 1636-80. [1944] Hoare. 1875. [3407]

SLIDE RULE, *continued* :

Oughtred. 1633. [6698] Campbell. 1886. [6977] Coggeshall. 1732. [7714-15] Everard. 1721-7. [8745-50] Gunter. 1636-80. [10814. 10816] Leybourn. 1676-98. [11195-7] Mackay. 1799-1802. [11472] Martin. *n. d.* [11802] Metius. 1626. [12995] Partridge. 1692. [14395] Roget. 1828. [14708] Scheffler. 1699. [14811] Selden. 1694. [14838-9] Shipwright's Vademecum. 1805. [14840] Shircliffe. 1740. [15098] Stone. 1728. [S 830] Hunt. 1697. [SS 403] Everard. 1684.

— *v. Gunter's Line. Rule (Carpenter's).*

SMELL, CHEMISTRY OF: [8684] Grew. 1679.

— *v. Perfumery.*

SMELTING: [1153-4] Ehrmann. 1786-7. [3052] Monnet. 1775. [5812] Arcet. 1766. [7470] Ehrmann. 1787. [10862] Linden. 1750. [11598] Matthey. 1892. [SS 2998] Borchers. 1897.

— *v. Iron Smelting.*

SMOKE ABATEMENT: [5423] Williams. 1841. [14951] Smith. 1857.

SMOKELESS POWDER: [2691] Longridge. 1891.

SNOW CRYSTALS: [2275] Kepler. 1611.

— LINE: [2025] Humboldt. 1820.

SOAP BUBBLES: [6435-6] Boys. 1890-2. [13401] Plateau. 1873.

— *v. Bubble Formation. Films.*

— MAKING: [3737] Poutet. 1828. [8295] Gathmann. 1899. [9567] Hurst. 1907. [S 3009] Carpenter. 1895. [S 3098] Morfit. 1871.

SODA INDUSTRY: [S 3085] Lunge. 1909.

— *v. Alkali. Chlorate Industry.*

'SODA' WATER: [2773] Magellan. 1783. [3789] Priestley. 1774. [7411] Duplais. 1858. [9477] Hospitalier. *v. y.* [11137] Luz. 1784. [11273-4] Magellan. 1777. [11937] Mitchell. 1913. [13652-4. 13669-70] Priestley. 1772-4.

— *v. Aeration. Mineral Waters.*

SODIUM AND ITS COMPOUNDS: [1498] Gay-Lussac et Thénard. 1811. [4260] Schneeberger. 1562. [6922] Clarke. 1820. [8314-15] Gay-Lussac et Thénard. 1811. [13255] Phipson. *c.* 1863. [13504-5] Pope. 1892-5. [13640] Prideaux. 1911.

SOLAR ECLIPSES: [1142] Eclipse Expedition. 1870-1. [1545] Glaisher. 1858. [2466] La Rue. 1862. [3614] Piazzzi. 1789. [3692] Poleni. 1717. [3890] Ranyard. 1879. [4207] Santini. 1872. [4498-9] Solar Eclipses. 1880-1906. [4871] Todd (D. P.). 1880. [4873] Todd (M. L.). 1894. [5184-5] Wallis. 1657. [5541] Ximenes. 1781. [5935-6] Bailly. 1811-21. [7030] Cossali. 1791. [7535] Emanuelli. 1910. [7837] Ferguson. 1767. [9192] Herschel. 1794. [9297] Hind. 1870. [10715-16] Le Monnier. 1781-8. [10962] Lockyer and Schuster. 1878. [11162] McClean, etc. 1908. [11619. 11623-4] Maunder. 1898-1900. [12474] Newcomb. 1879. [12853. 12855] Oudemans. 1871-2. [13164] Perry. 1889. [13910] Ranyard. 1879. [14095. 14099] Res-pighi. 1872. [14497] Rost. 1727. [15148] Struve. 1861. [S 1546] Maunder. 1901. [SS 1158] Kepler. 1605.

— PARADOXES: [3439] Palmer. 1798. [6531] Brothers. 1801. [7086] Croes. 1858. [13775] Pve. 1766.

— PARALLAX—*v. Parallaxes of the Solar System.*

— PHYSICS:—*v. Sun.*

— RESEARCHES: [9274] Higgins. 1852.

— SPECTRUM—*v. Spectrum (Solar).*

— SYSTEM—*v. Planetary Theory.*

— TABLES: [889-90] Cowper. 1766. [2842] Martin. 1765. [2934-5] Mayer. 1770. [3146-7] Muliers. 1611. [5583] Laplace. 1809. [5680] Airy. 1827. [6711] Capello. 1737. [9069]

SOLAR TABLES, *continued* :

Heath. 1760. [10548] La Rue. 1875. [11054] Loys des Cheseaux. 1754. [11690-1] Mayer. 1770. [SS 1664] Euler. 1746-51.

— THEORY: [2066] Metius. 1633. [6440] Brahe. 1648. [8215-17] Galilei. 1613. [10000] Kapteyn. 1901. [11803] Metius. 1632-3.  $\frac{21}{24}$  [SS 1708] Galilei. 1612.

SOLENOID: [13788-90. 13792-3] Quet. 1883-4. [14435] Rosa. 1907.

SOLID STATE, THEORY OF THE: [17321] Nemst. 1914.

SOLUBILITIES (CHEMICAL), DICTIONARY OF: [15103] Storer. 1864.

SOLUTION, THEORY OF: [170] Arrhenius. 1887.

[7137] Dalfsen. 1904. [8548] Graham. 1876. [8758] Guthrie. 1875-6. [8916] Harper's Scientific Memoirs. 1899. [9253] Herz. 1903. [9575] Hunt. 1854. [9859. 9862-3. 9869] Jones. 1893-1912. [9975] Kahlenberg. 1898. [10317] Kuenen. 1911. [10669] Lee. 1900. [11018] Loomis. 1893-4. [11134] Lupton. 1891. [11140] Lyle and Hosking. 1902. [11722] Melcher. 1909. [11760] Menschutkin. 1900. [12254] Muir. 1877. [12666-7] Nicol. 1882-3. [12847] Ostwald. 1891. [13021] Patterson and Stevenson. 1910. [13312] Pickering. 1886. [13814] Quince. 1901. [14186. 14195. 14214] Richards. 1902-11. [14642] Sakurai. 1908. [15533. 15535-6] Whetham. 1895-1902. [S 2656] Buchanan. 1912.

— *v. Cryoscopy. Osmosis.*

SOMBRERITE: [13271] Phipson. *n. d.*

SOUND, DISSIPATION OF: [3665] Plessner. 1885.

—, DYNAMICAL THEORY OF: [S 2058] Lamb. 1910.

—, INTERFERENCE OF: [13948] Rayleigh. 1902.

—, PITCH OF: [13782] Quesneville. 1879.

— *v. Tuning Fork.*

—, PROPAGATION OF: [4794] Testa. 1787. [9438] Hoorweg. 1876. [14406] Roiti. 1877. [SS 1664] Euler. 1750.

—, VELOCITY OF: [3036] Molk en Beck. 1823. [8672] Gregory. 1824. [9929] Joule. 1847. [10433] Lamb. 1898. [14545] Royal Institution. 1802. [15470] Watson. 1748. [S 1813] Colladon. 1837.

— *v. Acoustics.*

— AND COLOUR, ANALOGIES OF: [2745] Macdonald. 1869.

— WAVES: [5698] Airy. 1871. [6025] Bartoli. 1680.

SPACE (ABSOLUTE): [16413] Müller. 1911.

— (HYPER-): [16002-3] Fontené. 1892.

— AND GEOMETRY: [16344] Mach. 1906. [16562] Sauvage. 1893. [16692] Study. 1914.

— AND TIME, PSYCHOLOGY OF: [15635] Cyon. 1908.

—, THEORIES OF: [1936] Hirn. 1889. [13461-3] Poinsot. 1842-61. [13706-7] Proctor. 1883-6. [13845-6] Ralphson. 1702. [15001] Spottiswoode. *n. d.* [15646-7] Lechales. 1896-1909. [15653] Robb. 1914. [15656] Warrain. 1907. [16828] Black. 1910.

— *v. Relativity, Theory of.*

— ANALYSIS (GRASSMANN'S)—*v. Grassmann's S. A.*

SPEAKING TRUMPET: [2294] Kircher. 1671. [3053] Montanari. 1715. [10161] Kircher. 1671.

[12025] Montanari. 1715.

— *v. Ear Trumpet. Megaphone.*

— TUBE: [10770-4] Leurechon. 1630-74.

SPECTACLES: [187-8] Ayscough. 1750-5. [2306]

Kitchiner. 1824. [2846] Martin. 1758. [4435]

Smee. 1854. [6852] Chevalier. 1841. [10189]

Kitchiner. 1824. [10568] Laurance. 1908.

[11476] Martin. 1757. [S 2294] Scheffler. 1869.



- SPECTRA OF ELECTRIC LIGHT: [14365] Robinson. 1862.  
 — OF GASES: [14339] Plücker and Hittorf. 1864.
- SPECTROMETRY: [2517] Lefèvre. 1896.
- SPECTROSCOPY (ASTRONOMICAL): [4059] Röllvyn. 1871. [5773] Angström. 1868. [7357-60] Draper. 1879-84. [9529, 9531-2, 9534] Huggins. 1865-81. [10139] King. 1909. [10178-80] Kirchhoff. 1861-6. [10955, 10957, 10961] Lockyer. 1878-1903. [11084] Lunt. 1900. [11163] McClean. 1908. [11622] Maunder. 1886. [13304] Pickering. 1890. [14088, 14100-2] Respighi. 1870-85. [15110] Stoney. 1891. [16832] Campbell. 1913.
- (CHEMICAL): [13770, 13772] Purvis. 1907-9. [15178] Swan. 1856. [15481-2] Watts. 1873-1906. [S 1664] Angström et Thalén. 1875.
- (GENERAL): [616] Browning. 1882. [679] Capron. 1877. [903] Crookes. 1883. [2224] Kayser. 1883. [2518] Lefèvre. 1896. [2667, 2669] Lockyer. 1873-8. [3831] Proctor. 1888. [4071-5] Roscoe. 1869-85. [4243-6] Schellen. 1871-85. [5272-3] Watts. 1872-89. [6546] Browning. 1882. [6714] Capron. 1877. [7102] Crookes. 1884. [7276] Dibbitts. 1863. [8783] Hagenbach et Konen. 1905. [8914] Harper's Scientific Memoirs. 1898. [9004-5] Hasselberg. 1878-85. [9865-6, 9874-6, 9878-9] Jones. 1907-12. [9974] Kahlbaum. 1888. [10136-8] King. 1908-9. [10178-80] Kirchhoff. 1861-6. [10893-6] Liveing. 1895-1901. [10958, 10960] Lockyer. 1873-94. [11869-70] Miller. 1862-3. [12978] Parry. 1885. [13260, 13262] Phipson. 1869. [13499] Ponton. 1860. [14104] Respighi. 1886. [14448-50] Roscoe. 1870-85. [15223-5] Thalén. 1868-85. [15476-82] Watts. 1872-1906. [15620] Edinburgh Essays. 1770-1. [16939] Baly. 1905. [17090] Kayser. 1900-12. [S 1699] Baur. 1907.
- *v. Fraunhofer's Lines. Optics (Magneto-). Zeeman Effect.*
- (MICRO-): [4680] Suffolk. 1873. [7099] Crookes. 1869.
- SPECTRUM (SOLAR): [2822] Marci de Kronland. 1648. [3249-55] Newton. 1704-40. [7444] Edinburgh Essays. 1754-71. [12534-53] Newton. 1704-87.
- *v. Fraunhofer's Lines. Light, Dispersion of.*
- , CHEMICAL EFFECT OF THE: [1143] Eder. 1883.
- SPECULATIONS (SCIENTIFIC): [14802-3] Sedgwick. 1882-96. [15140] Stromeayer. 1911.
- *v. Astronomical S. Crystallization, S. on. Electricity, Theory of, S. on the. Ether Theories. Fourth Dimension. Gravitation, Hypotheses of Light, Theory of, S. on the. Magnetism, S. on. Heat, Theory of, S. on the. Mathematical S. Music, Theory of, S. on the. Physical S. Polarity, Causes of. Space and Time.*
- SPHERE, GEOMETRY OF THE: [4916] Torricelli. 1644. [9508] Howard. 1798. [14129] Reve. 1885. [15229-30] Theodosius Tripolita. 1558-86. [15322-3] Torricelli. 1644. [15831] Calinon. 1888. [15991] Fielder. 1882. [16117] Heger. 1908. [SS 890-1] Theodosius. 1558.
- (CELESTIAL), DOCTRINE AND USE OF THE: [499] Boulanger. 1650-1. [952] Danti. 1572. [2914] Mauro. 1550. [3910] Recorde. 1556. [5456] Witty. 1734. [7948] Flamsteed. 1680. [10099] Kepler. 1618. [11469] Martin. 1762 [11642-3] Mauro. 1550. [11646] Maurolico. 1575. [12346] Naibod. 1580. [13693, 13696] Proclus. 1536-73. [14284] Rivard. 1804. [14379] Rochemore. 1769. [15096] Stöffler. 1534. [15457] Ward. 1742. [S 1362] Autolycus. 1885. [SS 1011] Blundeville. 1597. [SS 1016] Boulenger. 1628. [SS 1032-3] Cavalieri. 1682-90. [SS 1185] Micalori. 1626. [SS 1341] Wright. 1613. [SS 1357] Blaeu. 1632.
- *v. Cosmography.*
- SPHERE (EIGHTH CELESTIAL), MOTION OF THE—*v. Primum Mobile.*
- , PROJECTION OF THE: [3088] Morgan. 1836. [7552, 7562] Emerson. 1749. [10040-1] Keith. 1820-45. [10360] La Caille. 1750. [12107] Morgan. 1836. [12353] Narrien. 1845. [15352] Turner. 1750-2. [16523] Richter. 1908.
- *v. Dialling.*
- SPHEROIDAL STATE: [6390] Boutigny. 1857.
- SPINNING: [5705] Alcan. 1864-5. [6755-6] Carter. 1904-7. [10684] Leggatt. 1893. [11150] M. (J.). 1832. [12031] Montgomery. 1836. [13576] Powell. 1661. [15171] Sutcliffe. 1816. [S 3145] Walsley. 1893.
- *v. Carding. Cotton. Silk. Textile Fibres.*
- JENNY: [5596-9] Zonca. 1607-56.
- TOP, THEORY OF THE: [10195] Klein und Sommerfeld. 1897-8. [11670] Maxwell. 1857. [13160] Perry. 1890. [17000-1] Crabtree. 1909-14.
- *v. Gyroscope.*
- SPIRAL (LOGARITHMIC): [4916] Torricelli. 1644. [12676] Nicolas. 1696-7. [15322-3] Torricelli. 1644.
- SPIRALS: [6376] Boulliau. 1657. [10491] Lankeren Matthes. 1857. [13196] Pfaff. 1832.
- *v. Helicoidal Apparatus.*
- SPODUMENE: [9966] Julien. 1879.
- SPRINGS (HOT)—*v. Thermal S.*
- , ORIGIN OF: [285] Bartholinus. 1703. [4977] Tyndall. 1872. [13940-1] Ray. 1693-1721. [SS 2228-30] Barlow. 1715-22. [SS 2254] Dalton. 1799.
- *v. Lakes. O. of. Rivers. O. of.*
- SQUARE (CARPENTER'S): [14732-3] Schoner. 1614.
- (GEOMETRICAL): [1055] Digges. 1625. [3563] Feuerbach. 1516. [4275] Schott. 1669. [8051-2] Foster. 1659. [S 647-50] Digges. 1556-1656. [SS 496] Henriou. 1621. [SS 512-14] Hulsius. 1603-15. [SS 648] Merliers. 1579. [SS 3069] Schuler. 1622.
- *v. Quadrat.*
- SQUARES AND CUBES, TABLES OF: [272] Barlow. 1875. [5994] Barlow. 1814. [7319] Dobson. 1858. [10564] Laundy. 1856. [SS 220] Blater. 1888. [SS 627] Magini. 1592.
- STAR ATLASES AND MAPS: [173] Astronomical Diagrams. c. 1870. [1051] Dien. 1877. [1080] Doppelmayer. 1742. [1349] Flamsteed. 1776. [1840] Heath. 1903. [1844] Heis. 1872. [1902] Herschel. 1847. [1904] Herschel and South. 1825. [2171] Johnston. 1856. [2312] Klein. 1893. [2785] Malby. 1859. [2831] Marsh. 1833. [3812, 3821, 3830, 3832-3] Proctor. 1867-79. [5019] Urania's Mirror. c. 1830. [5824] Argelander. 1843. [6063] Bazley. 1878. [6809] Cellarius. 1660-1708. [7045] Cottam. 1889. [7337-8] Doppelmayer. 1742. [7406-7] Dunkin. 1869-70. [7951] Flamsteed. 1795. [11179] McEwan. 1910. [13710, 13718] Proctor. 1896-1908. [15348] Turner. 1912. [15617-18] Bayer. 1603. [16824-5] Ball. 1905-10. [16839] Dien. 1897. [16854-5] Heis. 1872-8. [16871] Klein. 1888. [16881] McKready. 1912. [16887] Messer. 1902. [16888] Milham. 1909. [16899] Peck. 1890. [16903-4] Proctor. 1870-4. [S 1419] Cottam. 1891. [S 1445] Flamsteed. 1781. [S 1473] Hagen. 1899-1908. [S 1582] Proctor. 1896. [S 1610] Sternkarten. 1859. [SS 1001] Bayer. 1654.
- *v. Planisphere. Star Maps (Early).*
- CATALOGUES: [59] Airy. 1862-76. [90] Alphontius. 1483. [233-4, 240-1] Baily. 1827-45. [595] Brisbane. 1835. [1350] Flamsteed. 1725. [1525] Gilliss. 1895. [1530-2]

STAR CATALOGUES, *continued* :

- Gill, 1883-1902. [1538] Gill and Kapteyn. 1896-7. [1609] Gould. 1879. [2091] Innes. 1899. [3214] Newcombe. c. 1880. [3612] Piazzzi. 1903. [3847-52] Ptolemaeus. 1515-1816. [3870] Radcliffe Catalogue. 1870. [4139] Rümker. 1843-4. [4475] Smyth. 1844. [4520] South. 1826. [4624-6] Stone. 1873-81. [5469] Wollaston. 1789. [5543-4] Yarnall. 1870-8. [5921] Baily. 1845. [6441] Brahe. 1666. [6510] Brisbane. 1835. [7513] Ellery. 1874. [7711] Evans. c. 1900. [7949-50. 7952-3] Flamsteed. 1729-1837. [8051-2] Foster. 1659. [8186] Furness. 1905. [8406-13] Gill. 1883-1906. [8428] Gill and Kapteyn. 1896-1903. [8578] Grant. 1883. [8650] Greenwich Observations. 1904-8. [8826] Halley. 1679. [9086] Hedrick. 1905. [9235] Herschel. 1847. [9823] Johnson. 1835. [10419] Lalande. 1847. [11271] Madras Observatory. 1899. [12464] Newcomb. 1881. [13822] Radcliffe Observatory. 1894-1906. [13851] Rambaut. 1887. [14090-1] Respighi. 1880-5. [14225] Richardson. 1835. [14266] Ristenpart. 1906. [14362. 14364] Robinson. 1878-86. [14390. 14392] Rogers. 1882-6. [15214] Taylor. 1844. [15627] Burnham. 1906. [S 1357-8] Argelander. 1835-86. [S 1364] Auwers. 1903. [S 1383] Boss. 1910. [S 1605] Searle. 1912. [S 3559] Groombridge. 1838. [SS 1305] Snell. 1618.
- *v. Astronomical Tables.*
- CLUSTERS—*v. Nebulae.*
- COLOURS—*v. Stellar Chromatics.*
- CONSTANTS : [4627] Gill. 1877.
- CORRECTION TABLES : [7910] Finlay. 1895.
- GUIDES : [6915] Clark and Sadler. 1886. [16824-5] Ball. 1905-10. [16869] Klein. 1892. [16881] McKeady. 1912. [16886] Maunder. 1904. [16888] Milham. 1909. [18907] Rudaux. 1909.
- MAPS (EARLY) : [3625-9. 13296-9] Piccolomini. 1540-79. [15617-18] Bayer. 1603.
- MEASUREMENT—*v. Astrometry.*
- NAMES : [88] Allen. 1899.
- *v. Constellations.*
- PHOTOGRAPHS : [14295-6] Roberts. 1894-8. [16921] Wolf. 1908. [S 1598] Roberts. 1894-9.
- STARCH : [5971] Baranetzky. 1878. [7023] Corput. 1857. [8096] Frankel. 1881. [13258] Phipson. 1855-6.
- STARGAZING : [2138] Jenkins. 1869. [2668] Lockyer. 1878. [2906] Maunder. 1902. [10959] Lockyer. 1878. [13235] Phillips. 1809. [13698] Proctor. 1896. [16886] Maunder. 1904.
- *v. Astronomy (Popular). Astronomy (Practical).*
- STARS (CIRCUMPOLAR) : [8186] Furness. 1905.
- (DOUBLE) : [909] Crossley. 1879. [1518] Giacomelli. 1890. [1686] Grossmann. 1892. [2091] Innes. 1899. [2110] Jacob. 1846. [5544] Yarnall. 1870. [6241] Bishop. 1852. [6530] Brothers. 1867. [6632] Burnham. 1880. [7066-7] Crawford. 1876. [8476-7] Glasenapp. 1889-99. [8512] Goos. 1908. [9194] Herschel. 1784. [11653] Maw. 1892. [12682] Niesten. 1879. [13151] Perry. 1880-4. [13746] Przybyłok. 1908. [15123] Stoney. 1900. [S 1393-4] Burnham. 1881-1906. [S 1615] Struve. 1878-1901.
- (FLAMSTEED'S, 'OBSERVED BUT NOT EXISTING') : [13168] Peters. 1885.
- (NEW) : [2274] Kepler. 1606. [7289] Digges. 1573. [SS 1017] Brahe. 1610. [SS 1045-6] Colombe. 1606-8. [SS 1346] Zololi. 1619.
- (SHOOTING)—*v. Meteors.*

STARS (VARIABLE) : [153] Argelander. 1844. [2274] Kepler. 1606. [8508] Goodricke. 1785. [9200. 9205] Herschel. 1796. [10860] Lindemann. 1852. [13305. 13308] Pickering. 1881. [13338-9] Pigott. 1784-6. [S 1473] Hagen. 1899-1908.

— (ZODIACAL) : [5922] Baily. 1827. [9086] Hedrick. 1905.

STATE, CHANGE OF : [13580] Poynting. 1881. [13874] Ramsay and Young. 1884. [14328] Roberts-Austen. 1886.

STATES OF MATTER—*v. Matter, States of.*

STATICS : [1138] Earnshaw. 1845. [3003-4] Minchin. 1884-9. [3673-4] Poinsot. 1848-61. [4585] Stevinus. 1586. [9171] Hermann. 1716. [9822] Johnson. 1903. [11904-8] Minchin. 1880-6. [11962] Moebius. 1837. [12033] Monte. 1588. [13460-4] Poinsot. 1824-77. [15082-3] Stevinus. 1586. [16931] Antomari. 1897. [17017] Earnshaw. 1845. [17105] Lamb. 1912. [17144] Minchin. 1889-96. [17172. 17174] Petersen. 1882.

— *v. Mechanics.*

— (ANALYTICAL) : [4101-2] Routh. 1891-1902. [4898-9] Todhunter. 1858-66. [5344] Whewell. 1833. [8547] Graham. 1883. [14514] Routh. 1891-2. [17051] Graham. 1887. [17253] Todhunter. 1887.

— (ELEMENTARY) : [484] Bossut. 1772. [2867] Martino. 1727. [3051] Monge. 1835. [4458] Smith. 1869. [8617-18] Greaves. 1886-8. [12020] Monge. 1846. [17115. 17117] Loney. 1904-12. [SS 1805] Jordanus. 1533.

— (GRAPHIC) : [746] Chalmers. 1881. [3406] Ott. 1888. [4464] Smith. 1889. [6055] Bauschinger. 1871. [6925] Clarke. 1880. [7078] Cremona. 1890. [8547] Graham. 1883. [9822] Johnson. 1903. [10784] Lévy. 1874. [11669] Maxwell. 1876. [12865] Ott. 1885-91. [14297-80] Ritter. 1879-86. [16968] Bourlet. 1910. [17022] Ewering. 1912. [17051] Graham. 1887. [17071] Henneberg. 1911. [17072] Herrmann. 1904. [17079] Hoskins. 1899. [17108] Lauenstein. 1904. [17112] Lévy. 1886-8. [17163] Ott. 1879-85. [17222] Schotke. 1902. [17250] Timmerding. 1910. [S 1775] Cathcart and Chaffee. 1911. [S 1833] Culmann. 1880. [S 1859] Eddy. 1878. [S 3476] Hess. 1915.

— *v. Calculus (Graphical). Dynamics (Graphical). Graphic Methods.*

— (APPLICATIONS) : [17216] Ritter. 1888-1900. [S 3393] Chalmers. 1881.

STATISTICAL METHOD : [16211] King. 1912.

STATISTICS (MATHEMATICAL) : [15778] Bowley. 1907. [16809] Zeuner. 1869.

— (VITAL) : [4870] Toaldo. 1787. [12415] Neison. 1845. [12489] Newsholme. 1889.

— *v. Mathematics (Insurance).*

STEAM (SUPERHEATED)—*v. Superheating.*

—, CONDENSATION OF : [6617] Burgh. 1871. [9477] Hospitalier, *v. y.*

—, EXPANSIVE FORCE OF : [S 2533] Kämtz. 1826. [SS 1636] Dalton. 1802.

—, TENSION OF : [12210] Mossotti. 1837.

—, USE OF : [4712] Tack. 1834.

— BOILERS—*v. Boilers (Steam).*

— CARRIAGES : [4935] Tredgold. 1835. [5551] Young. 1860. [7978-9] Fletcher. 1891-1904. [8246] Galloway. 1834. [8524] Gordon. 1836. [11525] Mary. 1833. [15334] Trevithick. 1872. [SS 3014-15] Gordon. 1834. [SS 3084] Steam Carriages. 1831.

\* \* \* A collection of such books will be found in Messrs. Sotheran's Bibliotheca Viatica.

- STEAM ECONOMY : [13124] Perkins. c. 1840.  
— *v. Fuel Economy.*
- ENGINE, ELEMENTARY WORKS ON THE : [1588-9] Goodeve. 1879-91. [5163] Walker. 1908. [9409] Holmes. 1887-8. [9748] Jamieson. 1892. [10486] Langmaid and Gaisford. 1893. [10529] Lardner. 1848. [11798] Metcalf. 1905. [13161] Perry. 1904. [17345] Holmes. 1894-1902.
- —, HISTORY OF THE : [3472] Partington. 1822. [4659-63] Stuart. 1824-9. [6629-30] Burn. 1854-60. [7724-5] Ewbank. 1851-70. [7803] Farey. 1827. [8245-6] Galloway (E.). 1827-34. [8249] Galloway (R. L.). 1881. [8771] Hachette. 1830. [11588-9] Matschoss. 1901-8. [11874] Millington. 1830. [12987-9] Partington. 1822-38. [15293-4] Thurston. 1879-83.
- —, LECTURES ON THE : [5017] Unwin. 1868. [12986] Partington. 1826.
- —, PRACTICAL WORKS ON THE : [2999] Milne. 1830. [4012-13] Rigg. 1878. [5655] Adcock. 1839. [8888] Hann and Gener. 1854. [10145] King. 1875. [11737] Melville. 1890-1902. [11894] Milne. 1830. [12752-3] Northcott. 1877-89. [14141-2] Reynolds. 1881-98.
- —, THEORY OF THE : [3445. 12929-30] Peabody. 1839-44.
- —, THERMODYNAMICS OF THE : [13035] Peabody. 1906. [SS 2020] Regnault. 1847.
- —, TREATISES ON THE : [509] Bourne. 1862-6. [1751] Hallauer. 1878-81. [1954] Hodge. 1849. [3474] Partington. 1822. [3896] Rankine. 1885. [4852] Thurston. 1893-4. [4937-8] Tredgold. 1838-53. [5655] Adcock. 1839. [6387-8] Bourne. 1846-61. [6629-30] Burn. 1854-60. [6909] Clark. 1890-1. [7728] Ewing. 1894. [8825] Hallauer. 1878-81. [9349] Hodge. 1849. [9749-52] Jamieson. 1888-1906. [10530-3] Lardner. 1836-51 [12987-9] Partington. 1822-38. [13733] Prony. 1790-6. [13900] Rankine. 1874. [14263] Ripper. 1899. [14592] Russell. 1841. [14966] Snow and Leland. 1908. [17338] Ewing. 1910. [17340] Goodeve. 1891. [17352] Rankine. 1897.
- *v. Governor (Steam). Heat. Indicator Diagrams. Locomotive. Marine E. Vapour.*
- ENGINEERING : [12767] Nystrom. 1876. [13768] Pullen. *n.d.* [14987] Spangler, etc. 1903.
- ENGINES (EARLY) : [289] Bate. 1634-54. [560] Branca. 1629. [730] Caus. 1615. [1017-18] Desaguliers. 1734-44. [1875-6] Hero Alexandrinus. 1575. [3714. 3717] Porta. 1601-6. [4047-8] Robison. 1822. [4427. 4429-30] Smeaton. 1812-14. [4599] Stewart. 1767. [5257-60] Watt. 1854. [5505-8] Worcester. 1663-1825. [6043-4] Bate. 1634. [6684] Cambrey-Digny. 1766. [6777] Caus. 1704. [7237] Desaguliers. 1734-44. [9175-8] Hero Alexandrinus. 1575-1647. [10489] Langsdorf. 1787. [11296-7] Maillard. 1783-4. [12911] Papin. 1682. [12932] Papin. 1698. [13533-4] Porta. 1601-6. [14368-70] Robison. 1822. [14688-9] Savery. 1698-1880. [14916] Smeaton. 1814. [15335] Triewald. 1734. [S 3419] Dobrzenski. 1657. [S 3673] Watt. 1818. [SS 30] Bate. 1631. [SS 2968] Bramah. 1797. [SS 2987] Craddock. 1847. [SS 3014-15] Gordon. 1834. [SS 3083] Sorbiere. 1666.
- — (HIGH-PRESSURE) : [13125-6] Perkins. 1877-81.
- — (SPECIAL TYPES) : [3636] Pülbrow. 1841. [13991] Reech. 1844. [17358] Volkert. 1898-1900.
- —, DESIGN OF : [9343] Hobbs. 1907.
- HAMMER : [4282] Schryver. 1882.
- STEAM NAVIGATION, EARLY HISTORY OF : [2019] Hull-mandel. 1835. [2824] Marestier. 1824. [4010] Rigaud. 1838. [4087-8] Ross. 1828. [4224] Savery. *fs. of* 1698. [4571] Steam Navigation. 1858. [6582] Buchanan. 1816. [6946] Claxton. 1845. [7320] Dodd. 1818. [7753] Fairbairn. 1831. [8246] Galloway. 1834. [8802] Hale. 1868. [9425] Holt. 1878. [9684] Isherwood. 1859. [11413] Marestier. 1824. [11863] Miller. 1825. [12335] Napier. 1912. [12986-9] Partington. 1822-38. [13606] Preble. 1883. [13834] Railway Magazine. 1835-9. [13990] Reech. 1844. [14485] Ross. 1838. [14592] Russell. 1841. [14688-9] Savery. 1698-1880. [14793] Seaward. 1841. [15200] Talbot. 1912. [15328] Tourasse et Mellet. 1828-9. [15334] Trevithick. 1872. [S 3833] Woodcroft. 1848.
- TABLES : [14940] Smith. 1913. [SS 2020] Regnault. 1847.
- TURBINES—*v. Turbines (Steam).*
- STEEL (STRUCTURAL) : [SS 2901] Campbell. 1896.
- (TOOL) : [S 3169] Brearley. 1911.
- —, CORROSION OF : [S 3212] Cushman and Gardner. 1910. [S 3231] Friend. 1911. [S 3253] Hudson. 1913.
- —, METALLURGY OF : [327] Bell. 1884. [1406] Fraxno. 1850. [2136] Jeans. 1880. [3398] Osborn. 1869. [3416] Overman. 1854. [3541] Percy. 1864. [3917] Réaumur. 1722. [4412] Skelton. 1891. [4565] Stansbie. 1907. [5287] Webster. 1856. [5730] Alleyne c. 1872. [6108] Bell. 1884. [7441] Ede. 1863. [7477-8] Eisenhüttenwesen. 1902-6. [7745] Fairbairn. 1869. [8644] Greenwood. 1900. [9299] Hind. *n.d.* [9307-8] Hiorns. 1895-1903. [9518] Howe. 1904. [9772] Jeans. 1880. [9849] Jones. 1911. [12319] Mushet. 1840. [12840] Overman. 1850. [13113] Percy. 1864. [13138] Perret. 1779. [13971-2] Réaumur. 1722. [14331] Roberts-Austen. 1889. [14686] Sauveur. 1912. [S 3198] Campbell. 1904. [S 3237] Grenet. 1911. [S 3245] Harbord. 1905. [S 3247] Hassenfratz. 1812. [S 3253] Hudson. 1913. [S 3262] Jars. 1774-81. [S 3366] Woodworth. 1903. [SS 2919] Giolitti. 1914. [SS 2957] Schafhäütl. 1847.
- *v. Bessemer Process. Blast Furnace. Furnace (Regenerative Gas). Tungsten.*
- —, PRESERVATION OF : [S 3212] Cushman and Gardner. 1910.
- —, PROPERTIES OF : [10183-7] Kirkaldy. 1862-1870. [15166] Styffe. 1869. [S 3198] Campbell. 1904.
- —, MANUFACTURE, SECRETS OF : [13961] Recken. 1839.
- *v. Razors.*
- —, STRUCTURES : [3547] Perissé. 1884. [9141] Henrici. 1866.
- STELLAR CHROMATICS : [4480-1] Smyth. 1864. [9200. 9205] Herschel. 1796.
- —, LUMINOSITY : [6462] Brester. 1888.
- —, MOTIONS : [9205] Herschel. 1796. [16832] Campbell. 1913.
- —, PARALLAXES—*v. Parallaxes (S).*
- —, PHOTOMETRY—*v. Photometry (S).*
- STEREOCHEMISTRY—*v. Chemistry (Stereo).*
- STEREOSCOPE (THE) AND STEREOSCOPY : [614] Brown. 1903. [4435] Smece. 1854. [5338-9] Wheatstone. 1852-79. [6478-80] Brewster. 1856-70. [10146] Klieffel. 1863. [10886] Lissajous. 1738. [11011] Lonie. 1856. [13626] Prévost. 1843. [15516] Wheatstone. 1879. [17165] Parinaud. 1904.
- *v. Photography (Stereoscopic).*

- STEREOTOMY: [480] Bosse. 1643. [1420] Frezier. 1737-8. [2553] Leroy. 1844. [3630] Pierre de Ste-Marie Magdelaine. 1680. [7316-17] Dobson. 1849. [11551] Masonry. 1847. [16295] Leroy. 1890.
- STOICHIOMETRY: [3401] Ostwald. 1891. [13361] Rammelsberg. 1842. [15506] Wenzel. 1782. [17299] Biehringer. 1900. [S 2955-6] Young. 1908.
- STONE CUTTING—*v. Stereotomy.*
- STORM WARNINGS: [4310-11] Scott. 1876-87.
- STORMS, THEORY OF: [71] Alembert. 1747. [221] Baddeley. 1860. [452] Bohun. 1671. [1091] Dove. 1862. [1313] Faye. 1897. [1337] Finley. 1885. [2859] Martin. 1852. [3054] Montanari. 1694. [3621-2] Piddington. 1860-9. [3949-54] Reid. 1838-50. [4318] Sedgwick. 1852. [4914-15] Torricelli. 1715. [5133-4] Vossius. 1663. [5910-11] Bacon. 1653-62. [6296-7] Bohun. 1671. [6712] Capper. 1801. [7131] Cyclone Memoirs. 1890-3. [8125-8] Franklin. 1754-74. [8907] Hare. 1836. [10715-16] Le Monnier. 1781-8. [11012] Loomis. 1859. [11511] Martin. 1852. [12027] Montanari. 1694. [13320] Piddington. 1869. [14009] Reid. 1838. [14492] Rosser. 1876. [14533-5] Rowell. 1840-87. [15332] Toynbee. 1882. [S 2504] Dove. 1873.
- *v. Meteorology (Dynamic). Winds, Theory of.*
- STRAIGHT LINE, DRAWING OF A—*v. Linkages.*
- LINES: [12332] Nagel. 1882. [15831] Calinon. 1888.
- STRAINS (STRUCTURAL): [694] Cargill. 1873. [4369] Sheilds. 1861. [4620] Stoney. 1873. [6299] Bois. 1890.
- *v. Iron, Overstrains in.*
- STRENGTH OF MATERIALS: [101] Anderson. 1872. [243] Baker. 1870. [273] Barlow. 1837. [319] Bélanger. 1862. [2164] Johnson. 1897. [4931-4] Tredgold. 1822-46. [4955] Turnbull. 1831. [5221-2] Warr. 1851. [5479] Wood. 1871. [5985. 6002] Barlow. 1826-51. [6069] Beardslee. 1879. [6363] Bosscha. 1857. [7729] Ewing. 1903. [8731] Guest. 1900. [9351-2] Hodgkinson. 1846. [9782] Jenny. 1878. [10182-7] Kirkaldy. 1862-91. [11823] Michælis. *s.d.* [12146] Morin. 1857. [12407] Navier. 1864. [13369] Pisati e Saporito. 1877. [14123] Revere. 1910. [14807] Seguin. 1826. [15343] Turnbull. 1832. [15362] Unwin. 1888. [S 3341] Andrews. 1915. [S 3365] Bovey. 1900. [S 3366] Box. 1893. [S 3381] Burr. 1915. [S 3496] Johnson. 1905.
- *v. Elasticity. Engineering Testing.*
- HISTORY OF THE THEORY: [4891-2. 17251] Todhunter and Pearson. 1886-93.
- STRESSES, THEORY OF: [5016] Unwin. 1868. [5431] Williamson. 1894. [S 2037] Kelvin. 1856. [S 3635] Stoney. 1886.
- STRONTIUM: [970] Davy. 1808. [15287] Thorpe and Francis. 1910.
- STRUCTURAL DESIGN: [109] Anglin. 1891. [S 3476] Hess. 1915. [S 3608] Scott-Moncrieff. 1897-8.
- STRUCTURES, EQUILIBRIUM OF: [5221-2] Warr. 1851.
- THEORY OF: [S 3365] Bovey. 1900.
- STUDY AND TEACHING OF SCIENCE: [5426] Williamson. 1870. [9358] Hodson. 1909. [15318] Torraca. 1784.
- *v. Algebra, T. of. Chemistry, T. of. Mathematics, T. of. Physics, T. of.*
- STURM'S THEOREM: [5565] Young. 1841. [8380] Ghijben. *c.* 1836.
- STYRACINE: [13841] Ramdohr. 1857.
- SUBSTITUTION THEORY (CHEMICAL): [2483-4] Laurent. 1854-5. [7394] Dumas. 1840. [10571-3] Laurent. 1843-55.
- SUBSTITUTIONS, THEORY OF: [2156] Jevons. 1869. [9904] Jordan. 1870. [16138] Hilton. 1914. [16193] Jordan. 1870. [16428] Netto. 1908. [16693] Study. 1893.
- *v. Groups of Substitutions.*
- SUCCINIC ACID: [11688] Mayer. 1898. [13272] Phipson. *n.d.*
- SUCCINYLPHENYLAMIDE: [J422] Hoogewerf en van Dorp. 1890.
- SUGAR: [1429-30] Frühling. 1903. [2640] Lippman. 1895. [2815] Maquenne. 1900. [3523] Péligot. 1838. [3720] Porter. 1830. [4011] Rigby. 1788. [4140] Rümpler. 1898. [4300] Seoffern. 1849. [4599] Stewart. 1767. [4681] Sugar. 1828. [5270] Watts. 1893. [5401] Wiechmann. 1890. [5512] Wray. 1848. [7377] Dubrunfaut. 1825. [7713] Evans. 1847. [9856] Jones. 1832. [9889] Jones and Scard. 1909. [10582] Lawes. 1898. [10877] Ling and Rendle. 1905. [10933] Lock, etc. 1882. [11384] Maquenne. 1900. [11419] Marggraf 1767-8. [11740] Melsens. 1849. [12195] Moseley. 1800. [13539-40] Porter. 1830-43. [13545] Post et Neumann. 1910. [14432] Ronna. 1869. [S 3081] Lippmann. 1904.
- *v. Glucose. Saccharometry.*
- MACHINERY: [6620] Burgh. 1863.
- SULPHATES: [8554] Graham. 1837.
- SULPHIDES (METALLIC): [6089] Becquerel. 1840.
- (PHOSPHORESCENT)—*v. Phosphorescent S.*
- AS FUEL: [9406] Hollway. 1879.
- SULPHUR: [4328-9] Sendivogius. 1650-71. [4516] Sorel. 1902. [12357] Nasini e Costa. 1891. [13367] Pisati. 1877. [14814-15] Sendivogius. 1639-50.
- SULPHURETTED HYDROGEN: [13254] Phipson. *n.d.* [14697-8] Scheele. 1780-6.
- SULPHURIC ACID: [10032] Keir. 1787. [11097-8] Lunge. 1888-1903. [13310] Pickering. 1892. [14563-4] Rücker. 1891-2. [15464-6] Watson. 1791-1800. [SS 2657] Wuttig. 1815. [SS 2805] Lunge. 1903.
- SULPHUROUS ACID: [3790-1] Priestley. 1774-7.
- *v. Hyposulphites.*
- SUMS AND DIFFERENCES, RELATIONS BETWEEN: [8892] Hansen. 1865.
- SUN: [257-8] Ball. 1893. [2469] La Rue, etc. 1854-8. [2662-3] Lockyer. 1874-87. [3834-6] Proctor. 1871-6. [4316-17] Secchi. 1870-7. [5347] Young. 1882-3. [5061] Ball. 1893. [9201] Herschel. 1794. [10951-2. 10957] Lockyer. 1874-87. [11715] Meibauer. 1866. [12359] Nasmyth. 1861. [13502] Poor. 1905. [14092. 14097-8. 14100. 14105] Respighi. 1870-85. [14436] Rosa. 1874. [14847] Siemens. 1883. [S 1342] Abbot. 1912.
- *v. Solar. Zodiacal Light.*
- (ELLIPTIC): [SS 1287] Scheiner. 1615-17.
- SPOTS: [706. 6748] Carrington. 1863. [7529] Ellis. 1906. [8215-17] Galilei. 1613. [9235] Herschel. 1847. [9530] Huggins. *c.* 1867. [10951] Lockyer. 1887. [11620-1] Maunder. 1904-5. [SS 1288] Scheiner. 1612. [SS 1706-8] Galilei. 1612.
- SUN'S INFLUENCE ON AIR: [2913] Maurice. 1732.
- ROTATION—*v. Solar Theory.*
- SUPERHEATING: [1815] Hauvel. 1880. [8196] Gairns. 1907.
- *v. Boiler Explosions. Steam.*
- SUPERNATURAL IN NATURE: [11440] Reynolds. 1878.

- SUPERSTITION AND SCIENCE: [11312] Maitland. 1855.  
 — *v. Occultism in Science.*
- SURFACE (KUMMER'S): [2013, 16168] Hudson. 1905. [SS 230] Borchardt. 1888.  
 — TENSION: [13817] Quincke. 1901.  
 — *v. Bubble Formation. Capillarity. Films. Soap Bubbles.*
- SURFACES (ALGEBRAIC): [S 619] Darboux. 1872.  
 — (PSEUDO-): [16176] Issaly. 1902.  
 — (RECIPROCAL): [4183] Salmon. 1857.  
 — (RIEMANN'S): [15688] Appell et Goursat. 1895. [16150] Hofmann. 1888. [16433] Neumann. 1865.  
 — (SYMMETRICAL): [S 867] La Gournerie. 1867.  
 — (VIBRATING ELASTIC): [1288, 7769] Faraday. 1859.  
 — (TOPOGRAPHICAL): [16184] Javary. 1903.  
 — (TRAJECTORY): [S 968] Mannheim. c. 1873.  
 —, DIVISION OF: [11190] Machometo Bagdedino. 1570. [SS 615] Machometus. 1570.  
 —, DYNAMICS OF: [17135] Michaelis. 1909.  
 —, THEORY OF: [3436] Painvin. 1866. [7169] Darboux. 1889-96. [9779] Jellett. 1853. [10332] Kummer. 1863. [10446-7] Lamé. 1843. [10657] Lecorne. 1887. [11165] McCullagh. 1844. [12017] Monge. 1807. [12704] Noether. 1888. [13066] Pellet. 1878. [14307, 14309-11] Roberts. 1870-3. [14646-8] Salmon. 1865-82. [15718] Basset. 1910. [15747] Blythe. 1905. [15831] Calinon. 1895. [15876] Clebsch. 1875-91. [15904] Cremona. 1870. [15913] Darboux. 1887-96. [15969] Eisenhart. 1909. [16004] Forsyth. 1912. [16041] Gauss. 1870. [16185] Joachimsthal. 1881. [16233] Knoblauch. 1888. [16237-8.] Kommerell. 1903-11. [16507] Raffy. 1897. [16515] Résal. 1891. [16610] Schröter. 1880. [16792] Wilczynski. 1906. [SS 341] Cremona. 1870. [SS 483] Hesse. 1897. [SS 860] Steiner. 1832.  
 — *v. Curvature.*
- SURVEYING: [291] Bartoli. 1564. [897] Crocker. 1806. [1055-7] Digges. 1625-91. [1339] Firebrake. 1871. [1522] Gibson. 1768. [1671] Gribble. 1891. [1767] Hammond. 1731. [1804] Hartner e Wastler. 1894. [1870] Henry. 1895. [1975] Holwell. 1678. [2588-91] Leybourn. 1653-1722. [2705-6] Love. 1715-68. [2793-4] Mandey. 1717-27. [2947] Merett. 1897. [3018] Mitchell. 1827. [3904] Rathborne. 1616. [3943] Reid. 1859. [4413] Skrimshire. 1901. [4587] Stevinus. 1618. [5393] Whitelaw. 1906. [5442] Wilson. 1732. [5447-8] Wing. 1666-1700. [5539] Wyld. 1769. [5948] Baker. 1875. [6023-4] Bartoli. 1564-1614. [6049] Bauernfeind. 1890. [6122] Belli. 1595. [6456] Breed and Hosmer. 1906. [6633] Burns. 1771. [6765] Castle. 1847. [6770] Cataneo. 1608. [6772-3] Catini. 1559. [7286-8] Digges. 1571-91. [7542] Emerson. 1770. [7877] Fiammelli. 1605. [8242] Galli. 1694. [8396] Gillespie. 1875. [8686-7] Gribble. 1891-7. [9183] Hero Mechanicus. 1572. [9405] Holliday. 1838. [9456] Hopton. 1611. [9469] Hoskold. 1863. [9696] Jackson. 1880. [9821] Johnson. 1900. [10249] Köbel. 1563. [10708] Leigh. 1578. [10805-8] Leybourn. 1653-74. [11207] Mackenzie. 1908. [11438] Markham. 1878. [11486] Martin. 1766. [11767-9] Merrett. 1881-93. [12422-4] Nesbit. 1847-77. [13092] Penna. 1643. [13203] Philipps. 1721. [13293] Picard. 1692. [13331] Pifferi. 1695. [13541] Porter. 1799. [13925-7] Rathborne. 1616. [14569] Rudorf. 1813. [14734-5] Schooten. 1657. [14751] Schriften. 1848-52. [15046] Stevenson. 1810. [15581] Wilson (H.). 1755.
- SURVEYING, *continued*:  
 [15583] Wilson (H. M.). 1902. [15587] Wing. 1700. [16110] Hartner and Wastler. 1904-5. [SS 205] Belli. 1570. [SS 251] Burckhard. 1687. [SS 580] Leigh. 1592. [SS 742] Pomodoro. 1599.  
 — *v. Geodetic Surveys. Levelling. Mine S. Quantity S. Railway S.*  
 — (MILITARY): [9688-9] Jackson. 1838-60. [11853] Militär-geographisches Institut. 1884-1902.  
 — (NAUTICAL): [323] Belcher. 1835. [980] Dawson. 1833. [4050] Robson. 1834. [5337] Wharton. 1909. [5737-8] Alston. 1860-1902. [10563] Laughton. 1872. [15063] Stevenson. 1842. [S 3820] Shortland. 1890.  
 — (PHOTOGRAPHIC): [1039] Deville. 1895. [10667] Lec. 1899. [13016] Paté. 1862. [15583] Wilson. 1902.  
 — (TRIGONOMETRICAL): [2123, 2126] James. 1858-68. [2791] Malortie. 1820. [3134-6] Mudge, etc. 1799-1811. [3440] Palmer. 1873. [4118-20] Roy. 1785-90. [4956] Turnbull. 1849. [5157-8] Walker. 1863-6. [7596] Ergebnisse. 1901-6. [8165-6] Frome. 1850-62. [12245] Mudge. 1799-1811.  
 — INSTRUMENTS: [713] Cassini. 1792. [1055] Digges. 1625. [1382] Foulton. 1564. [1680] Grigby. 1807. [2790] Malombra. 1630. [4564] Stanley. 1901. [5448] Wing. 1700. [5790-1] Apianus. 1532-3. [7832] Ferguson. 1901. [7877] Fiamelli. 1605. [8053-4] Foulton. 1564. [9456] Hopton. 1611. [9688-9] Jackson. 1838-60. [11130] Lupicini. 1582. [11527] Marzari-Pencati. 1811. [13925-7] Rathborne. 1616. [13992] Reeves. 1910. [14746] Schott. 1660. [14765] Schwenter. 1616-18. [15587] Wing. 1700. [S 647-50] Digges. 1556-1656. [S 764-5] Gunter. 1623.  
 — *v. Instrument (Universal). Levelling I. Mathematical I. Quadrant. Sextant. Theodolite.*  
 — TABLES: [7975] Fletcher. 1895. [11194] Mackay. 1804.
- SYLLOGISM: [12120-1, 12124-7] Morgan. 1847-63.
- TACHOMETRY: [3391] Orlando. 1896.
- TALBOT'S LINES: [4651] Struve. 1883.
- TALC—*v. Magnesium and its Compounds.*
- TANGENCIES, PROBLEM OF: [129] Apollonius. 1607. [3448-9] Pappus. 1588-1660. [4409] Simon. 1812. [5063-4] Vieta. 1646. [5739] Alvard. 1853. [5798-9] Apollonius. 1771. [12938-9] Pappus. 1660-1871. [15390] Vieta. 1646.
- TANGENTS (GEOMETRICAL): [280-3] Barrow. 1670-1860. [1023-4] Descartes. 1649. [1067] Diverses Ouvrages. 1693. [1328] Fermat. 1679. [2531] Leibniz. 1768. [3234-5, 3277] Newton. 1711-45. [4419] Sluze. 1668. [6013-14] Barrow. 1735-1860. [7259-61] Descartes. 1659-1886. [10695-6] Leibniz. 1768-1884. [12572-3, 12579-80, 12588] Newton. 1711-45. [15999] Fleury. 1899.
- TANKS—*v. Pedraül.*
- TANNIC ACID: [966] Davy. 1803.  
 — *v. Galls.*
- TANNING: [966] Davy. 1803. [11161] McCann. 1883 [SS 2870-1] Tanning. 1774-80.  
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- TRANSPIRATION (LIQUID): [S 2749] Graham. 1861.
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- *v. Carriage Traction.*
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 — *v. Gauss's Analogies*.
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- , ELEMENTS OF: [3085. 3095] Morgan. 1837-49.  
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- TRISECTION OF AN ANGLE: [189] Azemar. 1809.  
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 Monteil. 1912.  
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- TROCHOID—*v. Cycloid*.
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 Drinker. 1878.  
 — *v. Blasting. Boring and Drilling. Earthwork*.
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 1912.  
 — *v. Channel Railway*.
- TURBINES (STEAM): [4613] Stodola. 1906. [5163]  
 Walker. 1908. [7295] Dietrich. 1906. [8390]  
 Gibson. 1908. [9484] Hospitalier. *v. y.* [9944]  
 Jude. 1906. [15236] Thomas. 1906. [S 3594]  
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 — *v. Marine Engines*.
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 Perigal. *n. d.* [16713] Taylor. 1874-5. [S 3521]  
 Lukin. 1871. [S 3566] Plumier. 1749.
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 — *v. Physical Constants*.
- UNIVERSAL SCIENCE, SYSTEM OF: [5495] Woodward.  
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 — *v. Chemistry, U. of. Geometry, U. of. Mathematics,  
 U. of.*
- VACUUM TUBES, EXPERIMENTS WITH: [4197]  
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 Phipson. *n. d.*
- VALLEYS, FORMATION OF: [10132] Kinahan. 1875.
- VALUES (CORRESPONDENT): [5227] Waring. 1789.
- VALUING—*v. Measuring and V.*
- VALVE (SAFETY): [12911] Papin. 1682.  
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 ward. 1892.
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 tine. 1881. [7374] Drysdale and Hayward.  
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 Hood. 1844-85. [10172] Kittredge. 1892.  
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 — *v. Chimneys and Stoves. Mine V. Smoke Abatement*.
- OF SHIPS: [4686] Sutton. 1749.
- VENUS (PLANET): [4278-80] Schröter. 1792-6. [6596]  
 Bugge. 1789. [9203] Herschel. 1793. [10864]  
 Lindenaу. 1810. [12681] Niessen. 1891.  
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 — *v. Transits of Venus*.
- VIADUCTS: [11696] Maynard. 1868. [12062]  
 Morandière. 1874-82.  
 — *v. Bridge Building*.
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- WATERWORKS: [289-90] Bate. 1634-54. [324] Bédilor. 1737-53. [651] Burton. 1894. [729] Caus (I. de). 1659. [730] Caus (S. de). 1615. [4700-1] Switzer. 1729-34. [5944] Baker. 1897. [6043-4] Bate. 1634. [6105] Bédilor. 1737-53. [6645] Burton. 1898. [6777] Caus. 1704. [9000] Haskoll. 1868. [9058] Hazlehurst. 1901. [9538] Hughes. 1872-82. [12159] Morland. 1697. [SS 30] Bate. 1631. — *v. Hydraulic Engineering.*
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- WHEELS (CARRIAGE): [914] Cumming. 1799. [14527-9] Rowe. 1734. — *v. Ball-Bearings. Carriage and Coach Building. Pedrail.*
- WIND AND CURRENT CHARTS: [3011] *Miscellanea Curiosa*. 1705-7. [10653] Le Clerc. 1705. [11649-52] Maury. 1854-61. [11943-5] *Miscellanea Curiosa*. 1708-27. [14031] Rennell. 1832. — *v. Ocean Charts.*
- WINDING MACHINERY: [13109] Percy. 1880.
- WINDS (TRADE) AND MONSOONS: [3011] *Miscellanea Curiosa*. 1705-7. —, THEORY OF: [452. 6296-7] Bohun. 1671. [7450] Eeles. 1771. [9587-8] Hutton. 1792. [11434-5] Mariotte. 1686-1700. [11943-5] *Miscellanea Curiosa*. 1708-27. [15320-1] Torricelli. 1715. [SS2228-30] Barlow. 1715-22. [SS2285] La Brosse. 1717. — *v. Air Currents. Meteorology (Dynamic). Sea Breeze. Storms, T. of.*
- WINE: [305] Beckwith. 1868. [758] Chaptal. 1807. [1012] Denman. 1875. [1112] Du Jardin. 1892. [2639] Lippe. 1894. [3202] Nessler. 1894. [3582] Phillip. 1596. [3715] Porta. 1583. [3922-3] Redding. 1851-60. [4361] Shannon. 1805. [4366] Shaw. 1863. [4849] Thudichum and Dupré. 1872. [5094] Vintners. c. 1750. [5637] Accum. 1820. [5871] Auberger. 1825. [6017] Barry. 1775. [6657] Busby. 1825. [6737] Carnell. 1814. [6826-7] Chaptal. 1801. [6829] Charpentier Cossigny. 1807. [7187] Davies. 1822. [7336] Donovan. 1830. [8762] Guyot. 1876. [9331] Hoare. 1841. [10302] Krebs. 1887. [10751] Le Sourd. 1892. [11159-60] McBride. 1793. [11168-9] Macculloch. 1816-7. [11628] Maumené. 1890. [11638] Maupin. 1799. [11725] Meibom. 1668. [12075] Morgan. 1898. [13012] Pasteur. 1875. [14287] Robert. 1897. [14559-60] Rozier. 1772. [14692] Scacchi. 1622. [15404] Vispré. 1786. — *v. Chaptalising. Cider. Fermentation.*
- , CHEMISTRY OF: [3144] Mulder. 1857. [8712] Grünhut. 1897. [14625] Sage. 1769.
- WIRE ROPE: [1935] Hipkins. 1896.
- WOOD, CHEMISTRY AND TECHNOLOGY OF: [761] Charpentier. 1890. [5091] Vincent. 1873. [S 3217] Demuth. 1907. —, PRESERVATION OF: [S3146] Wallis-Taylor. 1917. — *v. Dry Rot.*
- WOOD-ENGRAVING: [12910] Papillon. 1766. —, WORKING MACHINERY: [3889] Ransome. 1895. [3992] Richards. 1873. [14174-5] Richards. 1872.
- WORKSHOP RECEIPTS: [1736] Haldane. 1890. [2658-9] Lock. 1885-9. [4541] Spon. 1888. [8000] Haldane. 1906. [10932] Lock. 1885. — *v. Receipts (Practical).*
- WRITING GEOMETRICALLY DEMONSTRATED: [1823] Hawkes. 1747.
- X RAYS: [487] Bottone. 1898. [3115] Morton and Hammer. 1896. [3596] Phillips. 1898. [4067] Röntgen. 1896. [4068] Röntgen Ray Society (American). 1905. [4812] Thompson. 1896. [5182] Walsh. 1899. [6659] Büttner and Müller. 1897. [8740] Guillaume. 1896. [8915] Harper's Scientific Memoirs. 1899. [9077] Hébert. 1897. [12412] Neesen. 1904. [14433] Röntgen. 1896. [15239] Thompson. 1896. [S 3869] Röntgen Society. 1904-17.
- YACHTS: [10324] Kunhardt. 1887. [11415] Marett. 1856.
- ZEEMAN EFFECT: [10140] King. 1909. [S 2440] Zeeman. 1913.
- ZENITH DISTANCES: [11411] Marcuse. 1902. — *v. Polar Distances.*
- ZINC, CHEMISTRY AND METALLURGY OF: [3539] Percy. 1861. [5243-4] Watson. 1784-96. [6992] Combet. 1875. [7055] Cowper-Coles. 1904-5. [8752] Günther. 1904. [9662-3] Ingalls. 1902-3. [10341] Kupferschlaeger. 1860. [13111] Percy. 1861. [14202. 14206. 14213] Richards. 1895-1906. [15272] Thomson. 1831. [15464-6] Watson. 1791-1800. [S 3255] Ingalls. 1906.
- ZIRCONIUM: [13363] Pisani. 1864.
- ZODIACAL LIGHT: [4258] Schmidt. 1856. [9186] Herschel. 1867. [14789] Searle. 1883.

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