12.

PERICULUM
NOVI SYSTEMATIS MINERALOGICI

SIVE

DISPOSITIONIS CORPORUM NATURALIUM ANORGANICORUM,

SECUNDUM THEORIAM ELECTRO-CHEMICAM,

HABITA INSIMUL CHARACTERUM EXTERNORUM RATIONE.

P. I.

QUAM

VENIA AMPLISS. ORD. PHILOS. IMPERIAL. UNIVERS. ABOËNSIS

PRÆSIDE

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PRO GRADU PHILOSOPHICO

PUBLICO EXAMINI SUBJICIT

JOHANNES JACOBUS NERVANDER

Ostrobottniensis.

In Auditorio Philos. die VII Julii MDCCCXXVII.

h. a. m. s.

ABOÆ. *Ex Officina* J. C. FRENCKELL.

THESES.

I.

In Systemate Mineralogico secundum Theoriam Electro-Chemicam adornando, ut etiam in applicatione laudatæ Theoriæ ad ipsam scientiam chemicam, maximi certe est momenti, ut ordo relativus elementorum in serie Naturæ quo fieri possit modo accurate et stricte sit determinatus. Et cum effectus *oppositionis Electro-Chemicæ*, vel ut Chemici vulgo hunc appellare soliti sunt: *affinitas*, ex variis circumstantiis, ut diversa corporum volatilitate, cohæsione, qvantitate, et sic porro dependeat, eo magis in hac re extricanda cauto et circumspecto opus est judicio.

II.

Hinc eveniet, necesse est, ut locus quem jam minus certum elemento cuidam in serie assignaverint scientiæ cultores, tempore, progrediente scientia, mutari possit, ut etiam intervalla quasi, quæ hic et illic in serie electro-chemica nos observare credimus, novis detectis elementis occupentur. Hodierna Chemiæ conditio, cum statu ejusdem non nulla abhinc decennia comparata, dilucide hæc probat. Sic ex gr. præfinitum quasi locum occupavit Lithium vel ejus oxidum haud ita pridem detectum, sic Bromium sese Chlorio et Jodio concatenavit.

III.

Inter elementa vero, modo jam dicto contiguis universæ seriei quasi articulis destituta, in primis dubiæ est indolis, et a ceteris longiore utrinque quasi intervallo segregatum, Azotum. Hujus nempe cum Hydrogenio conjunctio ejusdemque nulla vel exigua ad alia corpora affinitas, nullam cum ceteris elementis patitur comparationem, nullam exhibet analogiam.

IV.

In corporibus Mineralibus seu anorganicis ordinandis igitur hæsitationem certe parere videtur Azotum. Cum Sulphure scilicet idem comparantes — et forsan potissimum cum hoc corpore comparari potest — videmus ex altera parte sulphur proprietatibus quibusdam oxygenii gaudere, azotum vero iisdem prorsus carere; Ex altera vero parte constat, affinitatem azoti ad oxygenium esse minimam, et hac quidem omnia fere cetera elementa azoto prævalere. In systemate tamen corporum anorganicorum commodiorem esse ordinem autumamus, quo Azotum ut magis electro-negativum quam Sulphur consideratur.

PERICULUM

NOVI SYSTEMATIS MINERALOGICI

PROOEMIUM.

Plura jam in lucem prodiere Systemata Mineralogica, neque pauciora fortassis prodibunt in posterum. In ipsa scilicet infinita et numquam exhaurienda rerum quibus Natura abundat, multitudine et copia, humanaque nonnisi lento gradu in Naturæ multimodis variæ adyta penetrandi facultate, ratio sine dubio quærenda est, cur quod hodie Scientiarum Cultoribus arridet systema, sæpius, currente tempore defectibus laborare aut ad metam quorsum tendit recta minime ducere videatur.

Hinc, Celeberrimo Berzelio ante decennium et quod excurrit suum Electro-Chemicum Systema Mineralogicum proponente, corporaque juxta partes constitutivas electro-positivas ordinante, observavit insimul Cel. Vir,, neque minus prospero successu corpora hæcce secundum partes suas electro-negativas posse collocari (cujus classificationis et schema exhibuit) quamquam tum temporis pluribus de causis priorem præferret methodum. Quum vero postmodum Celeb. Mitscherlich sua de corporibus isomorphis cogitata exponeret, probassetque, bases sive elementa electro-positiva salium sese invicem, servata forma crystallisationis, posse substituere, ansam arripuit Berzelius propositum a se systema commutandi, novumque, in quo corpora mineralia, secundum partes constituentes electro-negativas, disponerentur, edidit systema.

Quæ licet ita sint, etiam nobis tamen nihil impedire videtur, quominus Systema Mineralogicum etiam alia ratione corporum Isomorphismo possit superstrui, ea nempe ut non solum corpora magis composita, in quibus elementa isomorpha invicem sese substituant, in unum cogantur ordinem, verum ipsa quoque elementa, ut et simpliciores illorum conjunctiones, diversos efficere possint, a mineralibus hic et illic etiam consimiliter cristallisatis occupatos, ordines, Electro-chemicis tamen rationibus, quæ certe fundamenti loco ponendæ sunt systemati, minime posthabitis. Quin et Mineralogorum Scholæ, scientiam ipsam utpote Historiæ Naturalis partem considerantis, ideoque externos præcipue fossilium characteres respicientis, qua naturalis ex una specie in alteram fit transitus, postulatis, hoc fortassis modo aliqua ex parte satisfactum iri confidimus.

Harum itaque observationum respectu habito, progredimur jam ad tentamen quoddam Systematis Mineralogici proponendum. Quod vero dum facimus, tanto quidem majore jure veremur, ne operam nostram haud satis feliciter collocatam censeant lectores, quod res non solum ad Chemicorum, sed et ad laudatæ jam Mineralogorum Scholæ forum pertineat. Speramus nihilo tamen minus, neque hos neque illos voluntatem damnaturos si vel desiderarint vires.

I:mus ORDO:

ELEMENTA s. CORPORA SIMPLICIA.

Oxygenium,	Gas Oxygenii } in aëre	O.
Azotum,	Gas Azoti } athmosphærico	Az.
Sulphur,	Sulphur nativum,	S.
Carbonium,	Adamas,	C.
	Anthracitus.	
Arsenicum,	Arsenicum nativum[1],	As.
Tellurium,	Tellurium nativum,	Te.
Stibium,	Stibium nativum,	Sb.
Aurum,	Aurum nativum,	Au.
Platinum,	Platinum nativum,	Pt.
Palladium,	Palladium nativum,	Pa.
Hydrargyrum,	Hydrargyrum nativum,	Hg.
Argentum,	Argentum nativum,	Ag.
Bismuthum,	Bismuthum nativum,	Bi.
Plumbum,	Plumbum nativum,	Pb.
Cuprum,	Cuprum nativum,	Cu.
Ferrum[1],	Ferrum nativum,	Fe.
	a) Ferrum meteoricum.	
	b) Ferrum nativum vulcanicum.	

II:dus ORDO:

CONJUNCTIONES BINARIÆ.

Genera	Species	Nomina Mineralogica	Formulæ
1. Hydrargyridum:	Argenticum,	Amalgama,	$AgHg^2$
2. Osmidum:	Iridicum,		Ir Os.
3. Auridum:	Argenticum,	Electrum;	Ag Au.
4. Stibidum:	Argenticum,	*Antimon-Silber*,	Ag^2Sb.
5. Telluruda:	Telluridum Bismuthi,		$BeTe^x$
	—— Aureo-Plumbicum,	(*Blättererz*)	$AuTe^3+4PbTe^2$
	—— Aureo-Argenticum,	(*Schrifterz*),	$AgTe^2+3AuTe^6$
	—— triplex,	(*Weisserz*)	$AgTe^2+2PbTe^2+3AuTe^3$
6. Arsenida:	Arsenidum Cobalticum,	*Speiss-Cobalt*,	CoAs.
	—— Niccolicum,	*Arsenik-Nickel*	NiAs.
	—— Bismuthi,	*Arsenik-Wismuth*,	$BiAs^x$.
	—— Stibii,	*Arsenik-Spiesglanz*,	$SbAs^x$.
7. Carbonidum:	Ferri,	Graphites 1)	Fe & Cet. C^x.
8. Selenida:	Selenidum Plumbicum,	*Selen-blei*,	PbSe²
	—— Cuprosum,	*Selen-kupfer*,	Cu Se.

1) Ex analysibus, quas instituit Chemicus Americanus Vanuxem, sequi videtur, tam parvam in graphite contineri Ferri quantitatem, ut vix ac ne vix quidem pro Carbureto s. Carbonido Ferri haberi possit fossile hocce. Cum tamen diversas terras præter oxidum ferricum & manganicum dederint analyses, verisimile admodum fit, plura corpora metallica partem electro-positivam constituere posse. Ut species vel varietas carbonii saltem, nobis judicibus difficilius habendus sit Graphites.

Selenidum Argenticum, *Selen-silber*, $AgSe^2$.

——— Cuprico-Plumbicum, *Selen-kupfer-blei*, $CuSe^2 + 2PbSe^2$

——— Plumbico-Cupricum, *Selen-blei-kupfer*, $2PbSe^2 + 3CuSe^2$

——— Argentico-Cuprosum, Eukairitus, $2CuSe + AgSe^2$.

——— Hydrargyr.-Plumbicum, *Selen-Qvecksilber-blei*, $HgSe^2, PbSe^2$.

9. Sulphurida:

A.) Simplicia: Sulphuridum Manganicum, *Manganglanz*, MnS^2.

——— Zincicum, *Zinkblende*, a) ZnS^2.
b) ZnS^2, FS^2.

——— Ferrosum, *Magnetkies*, FeS^2.

——— Ferricum, a) flavum } Pyrites s. } FeS^4.
b) albidum } *Schwefelkies* }

——— Cobalticum, *Kobaltkies*, CoS^3.

——— Niccolicum, *Schwefel-Nickel*, NiS^2.

——— Cuprosum, *Kupferglanz*, CuS.

——— Plumbicum, Galena s. *Bleiglanz*, PbS^2.

——— Bismuthicum, *Wismuthglanz*, BiS^2.

——— Argenticum, *Silberglanz*, AgS^2.

——— Hydrargyricum, Cinnabaris, HgS^2.

——— Stibicum, *Grau-Spiesglanzerz*, SbS^3.

——— Molybdicum, *Molybdänglanz*, MoS^3.

——— Arsenicosum, Realgar, AsS^2.

——— Arsenicicum, Auripigmentum, AsS^3.

——— Hydrogenicum, (in Aquis Hepaticis), Hg^2S.

B.) Composita: ——— Ferroso-Cuprosum, *Bunt-Kupfererz*, $FeS^2 + 4CuS$.

Sulphuridum Cuproso-Ferricum, *Kupferkies*, $CuS+FeS^3$.

——— Bismuth.-Cuprosum, *WismuthKupfererz*, $2BiS^2+5CuS$?

——— Stannoso-Cuprosum, *Zinnkies*, SnS^2+2CuS.

——— Argentico-Cuprosum, *Silber-kupferglanz*, $2CuS+AgS^2$.

——— Stibico-Cuprosum, (*Schwarzerz*), $CuS+xSbS^3$.

——— Stibico-Plumbicum *), $3PbS^4+4SbS^3$(?).

——— Stibico-Argenticum, *Rothgülden*, $3AgS^2+2SbS^3$.

——— Triplex: (*Nadelerz*), $PbS^2+2CuS+2BiS^2$.

——— ——— Bournonitus, $CuS+PbS^2+SbS^3$.

——— ——— *Weissgiltigerz*, PbS^2,AgS^2,SbS^3(?).

——— *Wismuth-bleierz*, $FeS^2+AgS^2+2PbS^2+2BiS^2$(?).

10. Arsenido-Sulphurida: Arsenido-Sulphur.Ferricum, *Misspickel*, FeS^4+FeAs^2.

——— Cobalticum, *Koboltglanz*, CoS^4+CoAs^2.

——— Niccolicum, *Nickelglanz*, NiS^4+NiAs^2.

11. Jodida: Jodidum Natricum, (?) (in aqua maritima & in fontibus mineralibus) NJ^4.

—— Magnesicum, (in aqua maritima & in fontibus mineralibus) MJ^4(?).

—— Argenti, AgJ^x.

12. Chlorida: Chloridum Kalicum, KCl^4.

——— Natricum, Muria, NCl^4.

——— Calcicum, $CaCl^4$.

——— Magnesicum, MCl^4.

——— Argenticum, *Silber-hornerz*, $AgCl^4$.

——— Hydrargyrosum, *Quecksilber-hornerz*, $HgCl^2$.

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*) Vide: In Mineralogiam Fennicam Momenta, *pars tertia, analysin Sulfureti fossilis Stibico-Plumbici e Kalvola complectens.*

13. Fluorida: Fluoridum Calcicum, Spathum Fluoricum; $CaFl^2$.

——— Yttricum, YFl^2.

——— Cericum, $CeFl^2$.

——— Aluminicum, Fluellitus; AFl^2(?).

——— Cerico-Yttricum, $\left.\begin{matrix}Y\\Ce\end{matrix}\right\}Fl^2$(?).

——— Yttroceritus; $\left.\begin{matrix}Ca\\Y\\Ce\end{matrix}\right\}Fl^2$.

14. Oxida:

A.) Simplicia: a) Oxida Electropositiva:

Oxidum Manganicum, *Schwarz-Manganerz*, MnO^3.

Superoxidum Manganicum, *Grau-Braunsteinerz*, MnO^4.

Oxidum Ferricum, *Eisenglanz, Roth-Eisenstein &c.* FeO^3

—— Cuprosum, *Roth-Kupfererz*, CuO.

—— Cupricum, *Kupferschwärze*; CuO^2.

—— Plumbicum, *Natürl. Bleiglätte*; PbO^2.

Superoxidum Plumbicum, Minium s. *Mennig*, PbO^3.

Oxidum Bismuthicum, *Wissmuthocker*, BiO^2.

~~—— Uranicum, *Uran-Pecherz*, UO^2.~~

—— Stannicum, *Zinnstein*, SnO^4.

b) Oxida Electronegativa:

Oxidum Hydrogenicum,	Glacies, s. Aqua,	H^2O.
—— Aluminicum,	Corundus, Saphirus,	AO^3.
Acidum Silicicum,	Crystallum montanum, Quarzum, Calcedonius, Silex, Opalus & Cet.	SO^3.
Oxidum Titanicum, (?)	*Anatase*,	TiO^2.
Acidum Titanicum,	*Rutile*,	TiO^4.
Acidum Stibiosum,	*Antimonocker* & *Antimonblüthe*	SbO^4.
—— Wolframicum,		WO^3.
—— Molybdicum,	*Molybdânocker*,	MO^3.
Oxidum Chromosum,	*Chromocker*,	ChO^3.
Acidum Carbonicum,	Gas acidi Carbonici,	CO^2.
—— Arsenicosum,	*Arsenikblüthe*,	AsO^3.
Acidum Boracicum	(*Sassolin*)	BO^6.
—— Sulphurosum 11),	Gas acidi Sulphurosi,	SO^2.

B.) COMPOSITA: Oxidum Ferroso-Ferricum *Magnet-Eisenstein*, $\ddot{F}e\dot{F}e^2$, (fF^3)

—— Zinco-Mangiso-Ferric., Franklinitus $(\ddot{Z}n+\ddot{M}n)\dot{F}e^2$, $\left(\begin{matrix}Zn\\Mn\end{matrix}\right\}F^3)$

—— —— ——

11) Refertur quidem Acidum Sulphuricum quoque detectum esse ad Sienam in Terra Toscanensi a D:o Baldassari; sed nondum forsan adhuc decisa est quæstio, utrum Acidum liberum vel Sulphatem acidum contineat liquidum illud repertum.

Pehr Adolf von Bonsdorff, Periculum novi systematis mineralogici sive dispositionis corporum naturalium anorganicorum ... II. Resp. Carolus Henricus Lindequist. 9/7 1827.

III:tius ORDO:

OXY-SALIA

s. COMBINATIONES CORPORUM OXIDATORUM.

1. HYDRATES: Hydras Magnesicus, Brucitus, $MAq.$

—— Manganicus, $Mn^3Aq.$

—— Ferricus, *Braun-Eisenstein*, $Fe^2Aq.$

—— Uranicus, *Uranocker*, $U^xAq.$

2. ALUMINIATES: Aluminias Magnesicus, Spinellus, $MA^6.$

—— Ferroso-Magnesicus, *Pleonaste*, $\left.\begin{matrix}M\\f\end{matrix}\right\}A^6.$

—— Zincicus, Gahnitus, $ZnA^6.$

—— Beryllicus, Cymophanus s. Chrysoberyllus, $GA^6?.$

Bi-Aluminias Ferroso-Magnesicus, Canditus, $(M+f)A^2$

Aluminias Plumbicus, *Plomb Gomme*, $PbA^6+6Aq.$

—— Hydricus, Gibbsitus, $AAq.$

Tri-Aluminias Hydricus, *Diaspore*, $A^3Aq.$

3. SILICIATES:

A.) SIMPLICES: Bi-Silicias Calcicus, Wollastonitus s. *Taffelspath*, $CS^2.$

Tri-Silicias Calcicus, (Fossile ex Edelfors), $CS^3.$

Silicias Magnesicus vel Olivinus & Chrysolithus, $\left.\begin{matrix}M\\f\end{matrix}\right\}S.$

—— Forroso-Magnesicus

Silicias Magnesicus (?) Marmalithus, $MS+Aq(?).$

Bi-Silicias Magnesicus, (?) Pyrallolithus, $MS^2+xAq(?).$

Tri-Silicias Magnesicus, Steatites, (*Speckstein*), $MS^3 + \frac{1}{4}Aq$.

——— Magnesicus cum Aqua, *Meerschaum*, $MS^3 + 2Aq$(?).

Silicias Manganosus, *schwarzer Mangankiesel*, $mnS + Aq$.

Bi-Silicias Manganosus, *rother Mangankiesel*, mnS^2.

Sub-Silicias Manganicus, Mn^3S.

Silicias Cerosus, Ceritus; ceS.

Silicias Zincicus, Calamina, s. *Zinkglas*, $ZnS\frac{1}{2} + Aq$.

Tri-Silicias Ferrosus, Chloropalus, $fS^3 + 2Aq$(?).

Bi-Silicias Cupricus, *Dioptase*, $CuS^2 + 2Aq$(?).

Silicias Zirconicus, Zirconus, Hyacinthus, ZrS.

Sub-Silicias Aluminicus (?), Staurolithus, $\left.\begin{matrix} A^4 \\ F^4 \end{matrix}\right\} S$(?).

——— Bi-Aluminicus, Cyanitus, *Disthène*, A^2S.

Silicias Aluminicus, Sillimanitus, AS.

Tri-Silicias Aluminicus cum aqua, Lenzinitus, $AS^3 + 2Aq$.

—— —— —— Argillæ III), $AS^3 + xAq$.

—— —— —— & $\left.\begin{matrix} A \\ F \end{matrix}\right\} S^3 + xAq$(?).

B.) Compositi: a) $\ddot{R}\,\dddot{S}^x + x\ddot{R}\,\dddot{S}^x$.

III) Argillas Apyras, Terras Porcellaneas vel *Kaolin*, quæ ex decompositione Feltspathi oriuntur, in quibus vero non adhuc consummata est dissolutio, haud quaquam in systemate mineralogico referendas esse autumamus. Ante perfectam decompositionem enim non sunt nisi mixtiones Feltspathi & Silicias tis Aluminici.

Silicias Kalico-Calcicus, Apophyllitus $KS^6 + 8CS^3 + 16Aq.$

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Bi-Silicias Magnesico-Calcicus, } separati vel commixti } *Pyroxene f.* Malacolitus.
——— Ferroso-Calcicus, & } separati vel commixti } *a*) albus vel coloris expers $CS^2 + MS^2$.
——— Manganoso-Calcicus, } separati vel commixti } *b*) Viridis $CS^3 + \left.\begin{matrix} M \\ f \end{matrix}\right\} S^3$.

c) Cerasinus *) $CS^3 + \left.\begin{matrix} M \\ f \\ mn \end{matrix}\right\} S^3$.

d) Nigrescens (Hedenbergitus) $CS^2 + fS^2$.

e) Piceus (*Augit*) $CS^3 + \left.\begin{matrix} M \\ f \end{matrix}\right\} S^3$. $\left.\begin{matrix} \\ f \end{matrix}\right\} A^3$(?)

Trì-Silicias Calcicus cum Bi Siliciate Magnesico, separatis vel commixtis } Amphibolus iv)
——— Ferroso & } separatis vel commixtis } *a*) albus (Grammatitus) $CS^3 + 3MS^3$.
———Manganoso, } separatis vel commixtis } *b*) viridis (*Actinote f. Strahlstein*) $CS^3 + 3\left\{\begin{matrix} M \\ f \end{matrix}\right\} S^3$.
} separatis vel commixtis } *c*) fuscus vel niger (*Horn-blende*) $CS^3 + 3\left\{\begin{matrix} M \\ f \\ mn \end{matrix}\right\} S^2$. A^2(?).

Bi-Silicias Ferroso-Magnesicus, *Diallage* $fS^2 + 3MS^2$.
——— ——— ——— *Hypersthène* $fS^2 + MS^2$.
Silicias Calcico-Ferrosus, Ilvaitus $CS + 4fS$(?).
——— Magnesico-Ferrosus, Cronstedtitus $MS + 6fS + 9Aq$(?).
——— Ceroso-Yttricus, Gadolinitus *Ytterbyensis* $Ce^2S + f^2S + 4YS$.
——— Gadolinitus *Kårarfensis* YS, fS, ceS &c.

— — —

b) $\dot{\dot{R}}\dddot{S}x + x\dot{\dot{R}}\dddot{S}x$.

*) Malacolitus e *Degerö* prope urbem Helsingfors.

v) Si fluoridum qvoddam ad constitutionem chemicam pertinet Amphiboli, prout analyses diversarum varietatum hujus fossilis indicare videntur (cfr. K. Svenska Vetensk. Acad. Handl. 1821 p. 197 & seqv.), potius forsan ad Y:tum, quem infra proponemus, ordinem referendum esset hoc fossile.

Silicias Aluminico-Calcicus, — Ferrico-Calcicus, — Aluminico-Ferrosus, — — Magnesicus, — — Manganosus, (separati vel commixti)

Granatus: $(\dot{R}^3\dot{S}^2 + 2\dot{R}\dot{S})$.

a) Grossularius v): $CS + AS$.

b) Gran. Flavescens *): $CS + FS$.

c) Almandinus **): $fS + AS$.

e. s. p.

d) Granati commixti: $\left.\begin{matrix} C \\ M \\ f \\ mn \end{matrix}\right\} S + \left.\begin{matrix} A \\ F \end{matrix}\right\} S.$

e) Pyropus: $\left.\begin{matrix} C \\ M \\ mn \\ Cr \end{matrix}\right\} S + AS.$

Silicias Aluminico-Calcicus (?), *Idocras.*

a) Vesuvianus,

b) magnesiferus (Loboitus),

c) cupriferus (*Cyprin*)

— — — Gehlenitus $2CS + \left.\begin{matrix} A^2 \\ F^2 \end{matrix}\right\} S.$

— — — ***) $2\left\{\begin{matrix} C \\ M \end{matrix}\right\} S + \left.\begin{matrix} A \\ F \end{matrix}\right\} S.$

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v.) Fossile amorphum qvod Essonitus s. Kanelstein appelatur, cujusque eximina specimina in insula Ceylon, atque etiam in fodinis calcareis Pargasensibus reperiuntur, compositione sua qvoque prope admodum ad formulam illam $CS + AS$ accedit.

*) Granati ex *Thüringerwald, Altenau, Hesselkulla*, et *Långbanshyttan*, colore flavescente distincti, hanc formulam $CS + FS$ accurate vel proxime exhibent.

**) Granatus grandis *Fahlun*ensis formæ dedecaëdrae.

***) Fossile e *Montzom-Alpen* in valle *Fassaensi*, qvod v. Kobel examinavit et minus commode, ut videtur, appellavit *Gehlenitum Amorphum*.

Silicias Aluminico-Calcicus,	Epidotus,	
	a) Zoisitus,	$CS+2AS.$
	b) Pistacitus	$\left.\begin{matrix}C\\f\end{matrix}\right\}S+2AS.$
	c) Epid. Manganesiferus,	
Silicius Aluminico-Cerosus,	Cerinus	$2\left\{\begin{matrix}ce\\f\\C\end{matrix}\right\}S+AS.$
——	Orthitus	$(C, ce, f, Y)S^2+AS+xAq.$
Silicias Aluminico-Magnesicus,	Dichroitus (Steinheilitus)	$\left.\begin{matrix}M\\f\end{matrix}\right\}S^2+3AS.$
——	cum aqua *)	$\left.\begin{matrix}M\\f\end{matrix}\right\}S^2+3AS+2Aq.$
Silicias Kalicus, —— Natricus, —— Lithicus, —— Calcicus,	separati vel commixti	cum Siliciate Aluminico conjuncti:
	Elœolithus,	$\left.\begin{matrix}N\\K\end{matrix}\right\}S+3AS.$
	Nephelinus (Sommitus)	$NS+3AS.$
	Ittneritus	$(C+2N)S+3AS.$
	Diploitus	$(K+2C)S+5AS.$
	Werneritus { Scapolithus, *Paranthine*, Ekebergitus, *Mejonite* vi)	$\left.\begin{matrix}C\\N\end{matrix}\right\}S^2+2AS$ (?)

*) Recens ad Aboam in agro sedis Episcopalis (*Biskopsåkern*) repertum est hoc, Granito immixtum, fossile.

vi) Omnia hæc fossilia ad unam speciem referimus; num vero ad hanc Siliciatum, seriem referendus sit Werneritus ipse, an potius uti Carbono-Silicias habendus, de eo qvidem alia forsan occasione erit nobis locus disserendi.

Leucitus s. *Amphigene*, KS^2+3AS^2.
Labrador, $(N+3C)S^3+3AS$.
Spodumenus Natriferus *), $\left.\begin{matrix}N\\K\\C\end{matrix}\right\}S^3+3AS^2$.
Spodumenus s. *Triphane*, LS^3+3AS^2.
Feltspathum, KS^3+3AS^2.
—— (*Periklin*), $\left.\begin{matrix}N\\K\end{matrix}\right\}S^3+3AS^3$.
Albitus, NS^3+3AS^3.
Petalitus, LS^6+3AS^3.

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Appendix: Sphœrulitus, s. *Perlstein*, Resinitus s. *Pechstein*, Obsidianus, Marekanitus, } Mineralia, sine dubio ad seriem proxime antecedentem pertinentia, igne volcanico hquefacta et ad partem qvoque decomposita. } i. n. Note

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Silicias Ferrico-Natricus, Achmitus, NS^3+3FS^2.

— — —

Silicias Kalicus, —— Natricus, —— Baryticus, —— Calcicus, } separati vel commixti } cum Silicíate Aluminico et Aqva conjuncti } Zeolithi:

Thomsonitus, $2\big((N+3C)S+3AS\big)+5Aq.(?)$.
Prehnitus, $C^2S^3+3AS+Aq$.
Mesolus, $2\big((N+2C)S_2+3AS\big)+5Aq$.
Analcimus, NS^2+3AS^2+2Aq.

*) Nosmet in Nomenclatura latina dissertationem: Novus Fossilium Index, rationes ponderis capacitatis et oxygenii partium constitutivarum ostendens, sub præsidio Celeb. Gadolin editam, secutos esse, vel antehac observare debuimus.

Harmotome s. Kreutzstein, a) $(K+2C)S^3+3AS^2+5Aq.$

b) $(Ba+\&c.)S^3+3AS_2+5Aq.$

Chabasie, a) $\left.\begin{matrix}N\\K\end{matrix}\right\}S^2+3AS^2+6Aq.$

b) $\left.\begin{matrix}C\\N\\K\end{matrix}\right\}S^3+3AS^3+6Aq.$

Laumonitus, $CS^3+3AS\,4Aq$ (?).

Mesotypus, $NS^3+3AS+2Aq.$

Mesolithus, a) $(N+C)S^3+3AS+3Aq.$

b) $(N+2C)S^3+3AS+3Aq.$

(Scolezitus) c) $CS^3+3AS+3Aq.$

Epistilbitus, $\left.\begin{matrix}N\\C\end{matrix}\right\}S^3+3AS^3+5Aq.$

Stilbitus, a) $CS^3+3AS^3+6Aq.$

b) $\left.\begin{matrix}C\\N\end{matrix}\right\}S^3+3AS^3+6Aq.$

Heulanditus, s. *Stilbite anamorphique* (Haüy) $CS^3+4AS^3+6Aq.$

Brewsteritus, $\left.\begin{matrix}C\\N\end{matrix}\right\}S^3+4AS^3+8Aq.$

Silicias Aluminico-Beryllicus, Euclasius, $GS^2+2AS.$

Smaragdus, $GS^4+2AS^4.$

Siliciates nondum satis qva constitutionem chemicam investigati:

Andalusitus, Agalmatolithus, Antophyllitus,
Chiastolithus, Talcum, Lapis Lazuli,
Pinitus, Nephritus, &c.

4. HYDRO-SILICIATES: Hydro-Silicias Magnesicus,

— — Serpentinus, MAq^2+2MS^1.

5. ALUMINIO-SILICIATES: Aluminio-Silicias Ferroso-Magnesicus,

Saphirinus, $\left.\begin{matrix} M \\ f \end{matrix}\right\} \begin{matrix} A^6. \\ S. \end{matrix}$

— — Ferrosus,

Chamoisitus, f^2A+2fS.

6. TITANIATES: Titanias Ferrosus

— Ferricus, Crightonitus,

7. SILICIO-TITANIATES: Silicio-Titanias Calcicus, *Sphène*, CT^6+CS^6.

8. TANTALATES: Tantalas Calcico-Yttricus, Yttrotantalitus,

a) Niger $\left.\begin{matrix} Y^3. \\ C^3. \\ F.^3 \end{matrix}\right\} \begin{matrix} T^2. \\ \\ W^2 \end{matrix}$

b) Fuscus $\left.\begin{matrix} Y3 \\ C3 \end{matrix}\right\} Ta2$

— Uranico-Yttricus, Yttrotantalitus flavus, $\left.\begin{matrix} Y3 \\ U_2 \end{matrix}\right\} Ta2$

— — Ferroso-Manganosus, Tantalitus,

1) e *Kimitto*, MT_2+FeT_2.

2) e *Finbo* $\left.\begin{matrix} M \\ Fe \end{matrix}\right\} \begin{matrix} Ta^2. \\ Sn \end{matrix}$

3) e *Broddbo* $\left.\begin{matrix} Mn \\ Fe \\ Ca \end{matrix}\right\} \begin{matrix} Ta_2 \\ W_2 \\ Sn \end{matrix}$

— — — Tantalitus e *Bodenmais*, $MnTa4+4Fe^3Ta4$.

— — Tantalitus, e *Kimitto* (pulvere ochraseo). $\left.\begin{matrix} Fe \\ Mn \end{matrix}\right\} Ta2$

Pehr Adolf von Bonsdorff, Periculum novi systematis mineralogici sive dispositionis corporum naturalium anorganicorum ... III. Resp. Johannes Gabriel Norring. 9/7 1827.

9. Wolframiates: Wolframias Calcicus, Scheelitus s. *Tungsten* | $\ddot{Ca}\dddot{W}^2$ |
——— Ferroso-Manganosus, $\ddot{M}\dddot{W}^2+\ddot{Fe}\dddot{W}^2$
——— Manganoso Ferrosus, *Wolfram* $\ddot{M}\dddot{W}^2+3\ddot{Fe}\dddot{W}^2$
——— Plumbicus | $\ddot{Pb}\dddot{W}^2$ |

10. Molybdas: Molybdas Plumbicus | *Gelb-Bleierz* | $\ddot{Pb}\dddot{Mo}^2$ |

11. Chromates: Chromas Ferrosus (?) *Chrom-Eisenstein*
——— Plumbicus | *Roth-Bleierz* s. *Chrom-blei* | $\ddot{Pb}\dddot{Ch}$ |
——— Cuproso-Plumbicus | Vauquelinitus | $2\ddot{Pb}^3\dddot{Ch}+\ddot{Cu}^3\dddot{Ch}^2$.

12. Borates: *Boras Natricus* | *Borax* s. *Tinkal* | $\ddot{N}\dddot{B}^2+20Aq$. |
Boras Magnesicus | Boracitus | $\ddot{M}\dddot{B}$ |

13. Boro-Silicates: Boro-Bi-Silic. Calcic. | Bothryolithus, | $\ddot{Ca}\dddot{B}+\ddot{Ca}\dddot{S}^2+Aq$.
Bi-Boro-Silic. Calcicus | Datholithus, | $\ddot{Ca}\dddot{B}^2+\ddot{Ca}\dddot{S}^2+Aq$.
Borosilicias Aluminico-Natricus | Turmalinus s. *Schörl*
——— Aluminico-Lithicus | Rubellitus
& cet.
Borosilicias: Axinitus.

14. Carbonates: Carbonas Natricus, *Soda, Natron,* $\ddot{N}\ddot{C}^2$.
Sesqui-Carbonas Natricus, *Trona-Salz* $\ddot{N}\ddot{C}^3+4Aq$.
Bi-Carbonas Natricus, in fontibus $\ddot{N}\ddot{C}^4$.
Bi-Carbonas Lithicus, mineralibus $\ddot{L}\ddot{C}^4$.
Carbonas Baryticus, Witheritus, $\ddot{Ba}\ddot{C}^2$.
——— Stronticus, Strontianitus, $\ddot{Sr}\ddot{C}^2$.

Carbonas Calc.-Natric., Gay-Lussitus*), $\ddot{C}a\,\ddot{C}^2+\ddot{N}a\,\ddot{C}^2+11Aq.$

—— Carbonas Calcico Baryticus, Baroto-Calcitus $\ddot{C}a\,\ddot{C}^2+\ddot{B}\,\ddot{C}^2.$

—— Carbonas Calcicus $\ddot{C}a\,\ddot{C}^2$

a) Arragonitus (Chaux Carbonatée dur)

b) Spathum Calcareum, Creta & cet.

Bi-Carbonas Calcicus (in aquis mineralibus) $\ddot{C}a\,\ddot{C}^4.$

Carbonas Magnesicus, a) *Magnesia-Marmor*, b) Amorphus Magnesitus, $\ddot{M}\,\ddot{C}^2.$

—— —— c) Cum aqua Christallis. $\ddot{M}\,\ddot{C}^2+6Aq.$

—— —— d) Magnesia alba $\ddot{M}Aq+3\ddot{M}\,\ddot{C}^2.$

Carb. Magnes.-Calcicus, *Bitterspath* & *Bitterkalk* $\ddot{C}a\,\ddot{C}^2+\ddot{M}\,\ddot{C}^2.$

—— Manganosus $\left.\begin{matrix}\ddot{M}\\ \ddot{C}a\end{matrix}\right\}\ddot{C}^2.$

—— Ferrosus, *Eisenspath*, $\ddot{F}\,\ddot{C}^2$

Carbonates Calc. Magn. Mangen. & Ferros. Commixti: *Braunkalk* & cet. $\left.\begin{matrix}\ddot{C}a\\ \ddot{M}\\ \ddot{F}\\ \ddot{M}g\end{matrix}\right\}\ddot{C}^2$

Carbonas Zincicus Calaminæ species $\ddot{Z}\,\ddot{C}^2.$

Sub-Carbonas Zincicus $\ddot{Z}nAq^6+3\ddot{Z}n\,\ddot{C}$

*) Recens a D:no Boussingault prope urbem *Merida* in America meridionali detectum est et in honorem Celeberrimi Gay-Lussac appellatum hoc sal fossile.

Carbonas Cerosus, (terreus) $\ddot{C}e\,\ddot{C}^2$.

—— Plumbicus, *Bleispath*, $\ddot{P}b\,\ddot{C}^2$.

Sub-Carbonas Cupricus, Malachitus, $\ddot{C}u\ddot{C}+Aq$.

Carbonas Cupricus, *Kupfer-Lazur*, $\ddot{C}uA^2+2\ddot{C}u\,\ddot{C}^2$.

15. Carbono-Silicias: Cupricus *Kisel Malachit.*

16. Arseniates: Arsenias Calcicus 1) $\ddot{C}a\ddot{A}s+4Aq$.

2) Pharmacolithus $\ddot{C}a\ddot{A}s+6Aq$.

—— Magnesicus, Picro-Pharmacolithus, $\ddot{M}\ddot{A}s$.

—— Ferroso-Ferricus 1) Scoroditus, $\ddot{F}e\ddot{A}s+2\ddot{F}e\ddot{A}s+12Aq$.

2) Würfelerz, $\ddot{F}e^3\ddot{A}s+2\ddot{F}e^3\ddot{A}s^2+36Aq$.

Sub-Arseniis Cobalticus

Sub Arsenias Cobalticus,

Arseniis Niccolicus, *Nickelblüthe*, $\ddot{N}^2\ddot{A}s+18Aq$.

Arsenias Niccolicus, (Ochraceus e *allemont*), $\ddot{N}^3\ddot{A}s^2+18Aq$.

—— Cupricus 1) Euchroitus $\ddot{C}u^2\ddot{A}s+4Aq$.

2) *Linsenerz*

3) *Olivenerz.*

17. Phosphates: Phosphas Yttricus $\ddot{Y}^3\ddot{P}$.

—— Ferrosus 1) *Spathiges Eisenblau* $\ddot{F}e^2\ddot{P}^3+12Aq$.

2) —— —— $\ddot{F}e^4\ddot{P}^3+16Aq$.

3) terreus

Uranicus

— Ferroso-Manganosus, *Phosphor-Mangan*, $\dot{M}n^2\dddot{P}+\dot{F}e^2\dddot{P}$.

— Cuprosus, a) (c *Ehrenbretstein*) $\dot{C}u^5\dddot{P}^2+5Aq.$

b) (c *Liebithen*) $\dot{C}u^2\dddot{P}+2Aq.$

— Aluminicus a) Vavellitus $\dddot{A}l^4\dddot{P}^3+12Aq.$

b) Lazulithus (?)

c) Calaitus

— Aluminico-Lithicus, Amblygonitus $\dot{L}^2\dddot{P}+\dddot{A}l^4\dddot{P}^3$.

— Aluminicus (cum Phosph. Ammon)? (ex insula Bourbon.)

— Calcico-Uranicus, Uranitus, $\dot{C}a^3\dddot{P}^2+4\ddot{U}\dddot{P}+48Aq.$

— Cuprico Uranicus, Chalcolithus, $\dot{C}u^3\dddot{P}^2+4\ddot{U}\dddot{P}+48Aq.$

18. Sulphates: Sulphas Kalicus, (in fontibus mineralibus) $\dot{K}\dddot{S}^2$.

—— Natricus, Thenarditus, $\dot{N}a\dddot{S}^2$

—— —— cum aqua Sal Glauberi, $\dot{N}a\dddot{S}^2+20Aq$

—— Baryticus, Spatum ponderosum (*Schverspath*, $\dot{B}\dddot{S}^2$

—— Barytico-Stronticus, $\dot{B}a\dddot{S}^2+5\dot{S}r\dddot{S}^2$.

—— Stronticus, Schützitus *Coelestin*, $\dot{S}r\dddot{S}^2$.

—— Calcicus, Anhydritus, $\dot{C}\dddot{S}^3$.

—— Calcicus cum Aqua, Gypsum, $\dot{C}\dddot{S}^3+4Aq.$

—— Calcico Natricus, Glauberitus, $\dot{N}a\dddot{S}^3+\dot{C}\dddot{S}^2$

—— Magnesicus, Sal amarum, $\dot{M}\dddot{S}^2+12Aq.$