

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.

T H E S E S.

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, quantitate, et sic porro dependeat, eo magis in hac re extricanda cauto et circumspecto opus est iudicio.

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 comparisonem, 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.

(M. Nest)

PERICULUM
NOVI SYSTEMATIS MINERALOGICI

PROOEMIUM.

Plura jam in lucem prodire Systemata Mineralogica, neque pauciora fortassis prodibunt in posterum. In ipsa scilicet infinita et nunquam exhaurienda rerum quibus Natura abundat, multitudine et copia, humanaque nonnisi lento gradu in Naturæ multimodis variæ adyta penetrandi facultate, ratio sine dubio quaerenda 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 hæc 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.

I: mus O R D O :

ELEMENTA s. CORPORA SIMPLICIA.

OXYGENIUM,	Gas Oxygenii	} in aëre } atmosphærico	O.
AZOTUM,	Gas Azoti		Az.
SULPHUR,	Sulphur nativum,		S.
CARBONIUM,	Adamas,		C.
	Anthracitus.		
ARSENICUM,	Arsenicum nativum [!] ,		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 [!] ,	Ferrum nativum,		Fe.

a) Ferrum meteoricum.

b) Ferrum nativum vulcanicum.

H:das O R D O :

CONJUNCTIONES BINARIÆ.

Genera	Species	Nomina Mineralogica	Formule
1. HYDRARGYRIDUM:	Argentificum,	A m a l g a m a,	AgHg ²
2. OSMIDUM:	Iridicum,		Ir Os.
3. AURIDUM:	Argentificum,	Eleãrum;	Ag Au.
4. STIBIDUM:	Argentificum,	Antimon-Silber,	Ag ² Sb.
5. TELLURIDA:	Telluridum Bismuthi,		BeTe ^x
	— Aureo-Plumbicum, (<i>Blättererz</i>)		AuTe ³ +4PbTe ²
	— Aureo-Argentificum, (<i>Schrifterz</i>),		AgTe ² +3AuTe ⁶
	— triplex, (<i>Weisserz</i>)		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,	PbSe ²
	— Cuprosum,	Selen-kupfer,	CuSe.

1) Ex analysibus, quas instituit Chemicus Americannus 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 iudicibus difficiliter habendus sit Graphites.

Selenidum Argentium,	<i>Selen-silber,</i>	AgSe^2 .
——— Cuprico-Plumbicum,	<i>Selen-kupfer-blei,</i>	$\text{CuSe}^2 + 2 \text{PbSe}^2$
——— Plumbico-Cupricum,	<i>Selen-blei-kupfer,</i>	$2 \text{PbSe}^2 + 3 \text{CuSe}^2$
——— Argentico-Cuprosum,	<i>Eukairitus,</i>	$2 \text{CuSe} + \text{AgSe}^2$.
——— Hydrargyr.-Plumbicum,	<i>Selen-Quecksilber-blei,</i>	$\text{HgSe}^2, \text{PbSe}^2$.

9. SULPHURIDA:

A.) SIMPLICIA: Sulphuridum Manganicum,	<i>Manganglanz,</i>	MnS^2 .
——— Zincicum,	<i>Zinkblende,</i>	a) ZnS^2 .
		b) $\text{ZnS}^2, \text{FS}^2$.
——— Ferrosium,	<i>Magnetkies,</i>	FeS^2 .
——— Ferricum, a) flavum	} Pyrites s. }	} FeS^2 .
b) albidum		
——— Cobalticum,	<i>Kobaltkies,</i>	CoS^3 .
——— Niccolicum,	<i>Schwefel-Nickel,</i>	NiS^2 .
——— Cuprosum,	<i>Kupferglanz,</i>	CuS .
——— Plumbicum,	<i>Galena s. Bleiglanz,</i>	PbS^2 .
——— Bismuthicum,	<i>Wismuthglanz,</i>	BiS^2 .
——— Argentium,	<i>Silberglanz,</i>	AgS^2 .
——— Hydrargyricum,	<i>Cinnabaris,</i>	HgS^2 .
——— Stibicum,	<i>Grau-Spiesglanzerz,</i>	SbS^3 .
——— Molybdicum,	<i>Molybdanglanz,</i>	MoS^3 .
——— Arsenicosum,	<i>Realgar,</i>	AsS^2 .
——— Arsenicum,	<i>Auripigmentum,</i>	AsS^3 .
——— Hydrogenicum, (in Aquis Hepaticis),		Hg^2S .
B.) COMPOSITA:	——— Ferroso-Cuprosum,	<i>Bunt-Kupfererz,</i> $\text{FeS}^2 + 4 \text{CuS}$.

Sulphuridum Cuproso-Ferricum,	<i>Kupferkies</i> ,	$\text{CuS} + \text{FeS}^3$.
———— Bismuth.-Cuprosum,	<i>Wismuthkupfererz</i> ,	$2\text{BiS}^2 + 5\text{CuS}^?$
———— Stannoso-Cuprosum,	<i>Zinnkies</i> ,	$\text{SnS}^2 + 2\text{CuS}$.
———— Argentico-Cuprosum,	<i>Silber-kupferglanz</i> ,	$2\text{CuS} + \text{AgS}^2$.
———— Stibico-Cuprosum,	(<i>Schwarzerz</i>),	$\text{CuS} + x\text{SbS}^3$.
———— Stibico-Plumbicum *)	,	$3\text{PbS}^4 + 4\text{SbS}^3(?)$.
———— Stibico-Argenticum,	<i>Rothgülden</i> ,	$3\text{AgS}^2 + 2\text{SbS}^3$.
———— Triplex:	(<i>Nadelerz</i>),	$\text{PbS}^2 + 2\text{CuS} + 2\text{BiS}^2$.
———— ———	<i>Bournonitus</i> ,	$\text{CuS} + \text{PbS}^2 + \text{SbS}^3$.
———— ———	<i>Weissgiltigerz</i> ,	$\text{PbS}^2, \text{AgS}^2, \text{SbS}^3(?)$.
———— <i>Wismuth-bleierz</i> ,		$\text{FeS}^2 + \text{AgS}^2 + 2\text{PbS}^2 + 2\text{BiS}^2(?)$.

10. ARSENIDO-SULPHURIDA: Arsenido-Sulphur. Ferricum, *Misspichel*, $\text{FeS}^4 + \text{FeAs}^2$.

———— Cobalticum, *Koboltglanz*, $\text{CoS}^4 + \text{CoAs}^2$.

———— Niccolicum, *Nickelglanz*, $\text{NiS}^4 + \text{NiAs}^2$.

11. JODIDA: Jodidum Natriicum, (?) $\left(\begin{array}{l} \text{in aqua mariti-} \\ \text{ma \& in fontibus} \\ \text{mineralibus} \end{array} \right)$ NJ^4 .

———— Magnesium, $\text{MJ}^4(?)$.

———— Argenti, AgJ^x .

12. CHLORIDA: Chloridum Kalicum, KCl^4 .

———— Natriicum, *Muria*, NCl^4 .

———— Calcicum, CaCl^4 .

———— Magnesium, MCl^4 .

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

———— Hydrargyrosium, *Quecksilber-hornerz*, HgCl^2 .

*) Vide: IN MINERALOGIAM FENNICAM MOMENTA, pars tertia, analysin Sulfureti fossilis Stibico-Plumbici e Kalvola complens.

MINÉRALOGICUM.

13. FLUORIDA:	Fluoridum Calcicum,	Spathum Fluoricum;	$\text{CaFl}^2.$					
	—— Yttricum,		$\text{YFl}^2.$					
	—— Cericum,		$\text{CeFl}^2.$					
	—— Aluminicum,	Fluellitüs;	$\text{AlFl}^2(?)$.					
	—— Cerico-Yttricum,		<table style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding-right: 5px;">Y</td> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="2" style="padding-left: 5px;">$\text{Fl}^2(?)$.</td> </tr> <tr> <td>Ce</td> </tr> </table>	Y	}	$\text{Fl}^2(?)$.	Ce	
Y	}	$\text{Fl}^2(?)$.						
Ce								
	——	Yttroceritus;	<table style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding-right: 5px;">Ca</td> <td rowspan="3" style="font-size: 2em; vertical-align: middle;">}</td> <td rowspan="3" style="padding-left: 5px;">$\text{Fl}^2.$</td> </tr> <tr> <td>Y</td> </tr> <tr> <td>Ce</td> </tr> </table>	Ca	}	$\text{Fl}^2.$	Y	Ce
Ca	}	$\text{Fl}^2.$						
Y								
Ce								
	——	——						

14. OXIDA:

A.) SIMPLICIA: a) Oxida Electropositiva:

Oxidum Manganicum,	<i>Schwarz-Manganerz,</i>		$\text{MnO}^2.$
Superoxidum Manganicum,	<i>Grau-Braunsteinerz,</i>		$\text{MnO}^4.$
Oxidum Ferricum,	<i>Eisenglanz, Roth-Eisenstein</i>	$\text{E}^2\text{c.}$	FeO^3
—— Cuprosum,	<i>Roth-Kupfererz,</i>		$\text{CuO}.$
—— Cupricum,	<i>Kupferschwärze;</i>		$\text{CuO}^2.$
—— Plumbicum,	<i>Natürl. Bleiglätte;</i>		$\text{PbO}^2.$
Superoxidum Plumbicum,	<i>Minium s. Mennig,</i>		$\text{PbO}^3.$
Oxidum Bismuthicum,	<i>Wissmuthocker,</i>		$\text{BiO}^2.$
—— Uranicum,	<i>Urat-Pecherz,</i>		$\text{UO}^2.$
—— Stannicum,	<i>Zinnstein,</i>		$\text{SnO}^4.$

SYSTEMA

b) Oxida Electronegativa:

Oxidum Hydrogenicum, Glacies, s. Aqua, H²O.

— Aluminicum, Corundus, Saphirus, AlO³.

Acidum Silicicum, Crystallum montanum, Quarzum,
Calcedonius, Silex, Opalus & Cet. SO³.

Oxidum Titanicum, (?) *Anatase*, TiO².

Acidum Titanicum, *Rutile*, TiO⁴.

Acidum Stibiosum, *Antimonocker* & } SbO⁴.
Antimonblüthe }

— Wolframicum, WO³.

— Molybdicum, *Molybdänocker*, MO³.

Oxidum Chromosum, *Chromocker*, ChO³.

Acidum Carbonicum, Gas acidi Carbonici, CO².

— Arsenicosum, *Arsenikblüthe*, AsO³.

Acidum Boracicum (*Sassolin*) BO⁶.

— Sulphurosum II), Gas acidi Sulphurosi, SO².

B.) COMPOSITA: Oxidum Ferroso-Ferricum *Magnet-Eisenstein*, Fe²Fe³, (FF³)

— Zinco-Mangiso-Ferric, *Franklinitus* (Zn + Mn) Fe², (Zn } F³)
(Mn })

II) Refertur quidem Acidum Sulphuricum quoque detectum esse ad Sienam in Terra Toscanensi a D. Baldassarri; sed non forsitan adhuc decisa est quaestio, utrum Acidum liberum vel Sulphatem acidum contineat liquidum illud repertum.

MINERALOGIE.

Abhandlung

von

PERH ADOLF VON BONSDORFF, PERICULUM NOVI SYSTEMATIS

1. Mineralogische	Hydrat Magnesia, Perichlor	Hydr
—	— Magnesia	Hydr
—	— Kalk, Baryt-Fluorid	Hydr
—	— Kalk, Chlorid	Hydr
2. Mineralogische	Hydrat Magnesia, Perichlor	Hydr

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

Hydrat Magnesia, Perichlor	(Hydr)
— — — — — Fluorid	Hydr
— — — — — Kalk	Hydr
— — — — — Chlorid	Hydr

1. Mineralogische	Hydrat Magnesia, Perichlor	Hydr
—	— Magnesia	Hydr
—	— Kalk, Baryt-Fluorid	Hydr
—	— Kalk, Chlorid	Hydr
2. Mineralogische	Hydrat Magnesia, Perichlor	Hydr

III:tius O R D O :

OXY-SALIA

S. COMBINATIONES CORPORUM OXIDATORUM.

1. HYDRATES:	Hydras Magnesticus, Brucitus,	$MAq.$
	— Manganicus,	$Mn^3 Aq.$
	— Ferricus, Braun-Eisenstein,	$Fe^2 Aq.$
	— Uranicus, Uranocker,	$U^2 Aq.$
2. ALUMINIATES:	Aluminias Magnesticus, Spinellus,	$MA^6.$
	— Ferroso-Magnesticus, Pleonaste,	$M \left. \begin{array}{l} \\ f \end{array} \right\} A^6.$
	— Zincicus, Gahnitus,	$ZnA^6.$
	— Beryllicus, Cymophanus s. Chrysoberyllus,	$GA^6?.$
	Bi-Aluminias Ferroso-Magnesticus, Cauditus,	$(M+f)A^2$
	Aluminias Plumbicus, Plomb Gomme,	$PbA^6 + 6 Aq.$
	— Hydricus, Gibbsitus,	$AAq.$
	Tri-Aluminias Hydricus, Diaspore,	$A^3 Aq.$

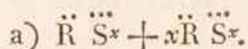
3. SILICIATES:

A.) SIMPLICES:	Bi-Silicias Calcicus, Wollastonitus s. Taffelspath,	$CS^2.$
	Tri-Silicias Calcicus, (Fossile ex Edelfors),	$CS^3.$
	Silicias Magnesticus vel } Olivinus & }	$M \left. \begin{array}{l} \\ f \end{array} \right\} S.$
	— Ferroso-Magnesticus } Chrysolithus, }	
	Silicias Magnesticus (?) Marmalithus,	$MS + Aq(?)$
	Bi-Silicias Magnesticus, (?) Pyralolithus,	$MS^2 + \infty Aq(?)$

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Tri-Silicias Magnesticus,	Steatites, (<i>Speckstein</i>),	$MS^3 + \frac{1}{4}Aq.$
———	Magnesticus cum Aqua, <i>Meerschaum</i> ,	$MS^3 + 2Aq(?)$.
Silicias Manganosus,	<i>schwarzer Mangankiesel</i> ,	$mnS + Aq.$
Bi-Silicias Manganosus,	<i>rother Mangankiesel</i> ,	$mnS^2.$
Sub-Silicias Manganicus,		$Mn^3S.$
Silicias Cerosus,	Ceritus;	$ceS.$
Silicias Zincicus,	Calamina, s. <i>Zinkglas</i> ,	$ZnS\frac{1}{2} + Aq.$
Tri-Silicias Ferrosus,	Chloro'palus,	$fS^3 + 2Aq(?)$.
Bi-Silicias Cupricus,	<i>Dioptase</i> ,	$CuS^2 + 2Aq(?)$.
Silicias Zirconicus, Zirconus, Hyacinthus,		$ZrS.$
Sub-Silicias Aluminicus (?),	Staurolithus,	$\left. \begin{matrix} A^4 \\ F^4 \end{matrix} \right\} S(?)$.
———	Bi-Aluminicus, Cyanitus, <i>Disthène</i> ,	$A^2S.$
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:



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

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

Bi-Silicias Magnesico - Calcicus, $\left\{ \begin{array}{l} \text{separati} \\ \text{vel} \\ \text{commixti} \end{array} \right\} \left. \begin{array}{l} \text{Pyroxene f. Malacolitus.} \\ a) \text{ albus vel coloris} \\ \text{expers } CS^2 + MS^2. \\ b) \text{ Viridis } CS^2 + \left. \begin{array}{l} M \\ f \end{array} \right\} S^2. \\ c) \text{ Cerasinus *) } CS^2 + \left. \begin{array}{l} M \\ mn \end{array} \right\} S^2. \\ d) \text{ Nigrescens} \\ \text{(Hedenbergitus) } CS^2 + fS^2. \\ e) \text{ Piceus (Augit) } CS^2 + M \left. \begin{array}{l} S^2 \\ f \end{array} \right\} A^2(?) \end{array} \right.$

Tri-Silicias Calcicus cum $\left\{ \begin{array}{l} \text{separatis} \\ \text{vel} \\ \text{commixtis} \end{array} \right\} \left. \begin{array}{l} \text{Amphibolus iv)} \\ a) \text{ albus (Grammatitus) } CS^3 + 3MS^2. \\ b) \text{ viridis (Actinote f. Strahlstein) } CS^3 + 3 \left. \begin{array}{l} M \\ f \end{array} \right\} S^2. \\ c) \text{ fuscus vel niger (Horn- blende) } CS^3 + 3 \left. \begin{array}{l} M \\ f \\ mn \end{array} \right\} S^2. \\ A^2(?) \end{array} \right.$

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 Kâarfensis $YS, fS, ceS \&c.$

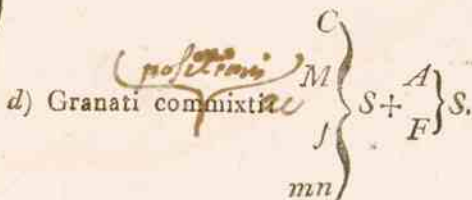
b) $\ddot{R} \ddot{S}_x + x \ddot{R} \ddot{S}_x.$

*) MALACOLITUS e *Degerö* prope urbem HELSINGFORS.

v) Si fluoridum quoddam 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 Nitum, quem infra proponemus, ordinem referendum esset hoc fossile.

Silicias Aluminico-Calcicus,	$\left. \begin{array}{l} \text{separati} \\ \text{vel} \\ \text{commixti} \end{array} \right\}$	Granatus: $(R^3 S^2 + 2R S)$.
— Ferrico-Calcicus,		a) Grossularius v): $CS + AS$.
— Aluminico-Ferrosus		b) Gran. Flavescens *): $CS + FS$.
— — Magnesticus,		c) Almandinus **): $fS + AS$.

e. s. p.



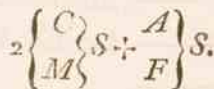
Silicias Aluminico-Calcicus (?),

Idocras.

a) Vesuvianus,

b) magnesiferus (Loboitus),

c) cupriferus (Cyprin)

Gehlenitus $2CS + \frac{A^2}{F^2} S$ 

v.) Fossile amorphum quod Essonitus s. Kanelstein appellatur, cujusque eximina specimina in insula CEYLON, atque etiam in fodinis calcareis Pargasensibus reperiuntur, compositione sua quoque 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 *Fahlunensis* formæ dedecaëdrae.

***) Fossile e *Montzom-Alpen* in valle *Passaensi*, quod 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. Mangesiferus, \ast

Silicias 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-Magneticus, Dichroitus (Steinheilitus) $\left. \begin{matrix} M \\ f \end{matrix} \right\} S^2 + 5AS.$
 cum aqua \ast) $\left. \begin{matrix} M \\ f \end{matrix} \right\} S^2 + 5AS + 2Aq.$

Silicias Kalicus, $\left. \begin{matrix} separati \\ \\ \\ commixti \end{matrix} \right\}$ et cum Siliciate Aluminico
 Natricus, $\left. \begin{matrix} \\ \\ \\ \end{matrix} \right\}$ vel
 Lithicus, $\left. \begin{matrix} \\ \\ \\ \end{matrix} \right\}$
 Calcicus, $\left. \begin{matrix} \\ \\ \\ \end{matrix} \right\}$ conjuncti:

Elceolithus, $\left. \begin{matrix} N \\ K \end{matrix} \right\} S + 5AS.$
 Nephelinus (Sommitus) $NS + 5AS.$
 Ittneritus $(C + 2N) S + 5AS.$
 Diploitus $(K + 2C) S + 5AS.$

Werneritus $\left\{ \begin{matrix} Scapolithus \\ Paranthine \\ Elebergitus \\ Mejonite vi \end{matrix} \right. \left. \begin{matrix} C \\ N \end{matrix} \right\} S^2 + 2AS (?)$

\ast) Recens ad Aboam in agro sedis Episcopalis (*Biskopsåkeren*) 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 quidem alia forsitan occasione erit nobis locus discernendi.

SYSTEMA

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

APPENDIX: Sphaerulitus, s. *Perlstein*, } Mineralia, sine duio
 Resinitus s. *Pechstein*, } ad seriem proxime an-
 Obsidianus, } tecedentem pertine-
 Marekanitus, } tia, igne volcanico li-
 quofacta et ad partem }
 quoque decomposita. } *Note*

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

Silicias Kalicus, { separati } cum Silicioate Aluminico }
 ----- Natricus, { vel } et Aqua conjuncti } Zeolithi:
 ----- Baryticus, { commixti }
 ----- Calcicus, {

Thomsonitus, $2((N + 3C)S + 3AS) + 5Aq$. (?)

Prehnitus, $C^2S^2 + 3AS + Aq$.

Mesolus, $2((N + 2C)S_2 + 3AS) + 5Aq$.

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

*) Nosmet in Nomenclatura latina dissertationem: NOVUS FOSSILUM INDEX, ratio-
 nes ponderis capacitatis et oxygenii partium constitutarum ostendens, sub prae-
 sidio Celeb. GADOLIN editam, secutos esse, vel antehac observare debuimus.

Harmotome s. Kreuzstein, a) $(K+2C)S^3+3AS^2+5Aq.$
 b) $(Ba+\&c.)S^2+3AS_2+5Aq.$

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

Laumonitus, $CS^2+5AS_4Aq(?)$
Mesotypus, $NS^2+3AS+2Aq.$

Mesolithus, a) $(N+C)S^3+3AS+5Aq.$
 b) $(N+2C)S^2+5AS+5Aq.$
 (Scolezitus) c) $CS^2+3AS+5Aq.$

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

Stilbitus, a) $CS^2+3AS^3+6Aq.$
 b) $\left. \begin{matrix} C \\ N \end{matrix} \right\} S^2+3AS^3+6Aq.$

Heulanditus, s. Stilbite
anamorphique (Häuy) $CS^2+4AS^2+6Aq.$

Brewsteritus, $\left. \begin{matrix} C \\ N \end{matrix} \right\} S^2+4AS^3+8Aq.$

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

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

Silicates nondum satis quae constitutionem chemicam investigati:

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

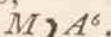
4. HYDRO-SILICIATES: Hydro-Silicias Magnesticus,

Serpentinus,



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

Saphirinus,



Ferosus,

Chamoisitus, $f^2 A + 2fS.$

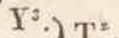
6. TITANIATES: Titanias Ferosus

— Ferricus,

Crightonitus,

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

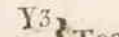
8. TANTALATES: Tantalas Calcico-Yttricus, Yttrotantalitus,



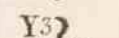
a) Niger



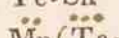
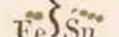
l) Fuscus



— Uranico-Yttricus, Yttrotantalitus flavus,



— Ferroso-Manganosus, Tantalitus,

1) e *Kimitto*, $MT_2 + FeT_2.$ 2) e *Finbo*3) e *Brodbo*

Tantalitus

e *Bodenmais*, $MnTa_4 + 4Fe^3Ta_4.$ Tantalitus, e *Kimitto*

(pulvere ochraseo).



Pehr Adolf von Bonsdorff, Periculum novi systematis
mineralogici sive dispositionis corporum naturalium
anorganicorum ... III. Resp. Johannes Gabriel Nor-
ring. 9/7 1827.

9. WOLFRAMIATES: Wolframias Calcicus, Schilitus s. Tungsten $\text{Ca}\ddot{\text{W}}^2$ | fee
 ——— Ferroso-Manganosus, $\ddot{\text{M}}\ddot{\text{W}}^2 + \ddot{\text{F}}\ddot{\text{e}}\ddot{\text{W}}^2$ |
 ——— Manganoso-Ferrosus, Wolfram $\ddot{\text{M}}\ddot{\text{W}}^2 + 3\ddot{\text{F}}\ddot{\text{e}}\ddot{\text{W}}^2$ |
 ——— Plumbicus $\text{Pb}\ddot{\text{W}}^2$ |

10. MOLYBDAS: Molybdas Plumbicus | Gelb-Bleierz | $\text{Pb}\ddot{\text{M}}\ddot{\text{o}}$ |

11. CHROMATES: Chromas Ferrosus (?) | Chrom-Eisenstein | $\ddot{\text{F}}\ddot{\text{e}}\ddot{\text{C}}\ddot{\text{h}}$ | 18
 + Plumbicus | Roth-Bleierz s. Chrom-blei | $\text{Pb}\ddot{\text{C}}\ddot{\text{h}}$ | 19
 — Cuproso-Plumbicus Vauquelinitus | $2\ddot{\text{P}}\ddot{\text{b}}^3\ddot{\text{C}}\ddot{\text{h}} + \ddot{\text{C}}\ddot{\text{u}}^3\ddot{\text{C}}\ddot{\text{h}}^2$ |

12. BORATES: Boras Natricus | Borax s. Tinkal | $\ddot{\text{N}}\ddot{\text{B}}^2 + 20\text{Aq.}$ | 11
 Boras Magneticus | Boracitus | $\ddot{\text{M}}\ddot{\text{B}}$ | 11

13. BORO-SILICATES: Boro-Bi-Silic. Calcic. Bosphryolithus, $\text{Ca}\ddot{\text{B}} + \text{Ca}\ddot{\text{S}}^2 + \text{Aq.}$ | 11
 Bi-Boro-Silic. Calcicus Papholithus, $\text{Ca}\ddot{\text{B}}^2 + \text{Ca}\ddot{\text{S}}^2 + \text{Aq.}$ |
 Borosilicias Aluminico-Natricus | Turmalinus s. Schörl | 11
 — Aluminico-Lithicus, Rubellitus,
 & cet.

Borosilicias: Axinitus.

14. CARBONATES: Carbonas Natricus, Soda, Natron, $\ddot{\text{N}}\ddot{\text{C}}^2$.
 Sesqui-Carbonas Natricus, Trona-Salz, $\ddot{\text{N}}\ddot{\text{C}}^3 + 4\text{Aq.}$ |
 Bi-Carbonas Natricus, in fontibus $\ddot{\text{N}}\ddot{\text{C}}^4$.
 Bi-Carbonas Lithicus, mineralibus $\ddot{\text{L}}\ddot{\text{C}}^4$.
 Carbonas Baryticus, Witheritus, $\ddot{\text{B}}\ddot{\text{a}}\ddot{\text{C}}^2$.
 — Stronticus, Strontianitus, $\ddot{\text{S}}\ddot{\text{r}}\ddot{\text{C}}^2$.

12. Borax
 13. Schörl
 14. Borax
 15. B. lithicus
 16. Carbonates

us
 Carbonas Calc.-Natric., Gay-Lussitus*), $\text{Ca } \ddot{\text{C}}^2 + \text{Na } \ddot{\text{C}}^2 + 11 \text{Aq.}$

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

Carbonas Calcicus $\text{Ca } \ddot{\text{C}}^2$

a) Arragonitus (Chaux Carbonatée dur)

b) Spathum Calcareum, Creta & cet.

Bi-Carbonas Calcicus (in aquis mineralibus) $\text{Ca } \ddot{\text{C}}^2.$

Carbonas Magnesticus, a) *Magnesia-Marmor*, } $\ddot{\text{M}} \ddot{\text{C}}^2.$

b) Amorphus Magnesticus, } $\ddot{\text{M}} \ddot{\text{C}}^2.$

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

d) *Magnesia alba* $\ddot{\text{M}} \ddot{\text{A}} \text{q} + 3 \ddot{\text{M}} \ddot{\text{C}}^2.$

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

— Manganosus } $\ddot{\text{M}} \ddot{\text{C}}^2.$

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

Carbonates Calc. Magn. Mangan. *Braunkalk* } $\ddot{\text{C}}^2$

& Ferros. Commixti: & cet. } $\ddot{\text{C}}^2$

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

Sub-Carbonas Zincicus $\text{ZnAq}^6 + 3 \ddot{\text{Zn}} \ddot{\text{C}}$

*) Recens a D:ino 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,	<i>Bleispath</i> ,	$\ddot{P}b \ddot{C}^2.$
Sub-Carbonas Cupricus,	<i>Malachitus</i> ,	$\ddot{C}u \ddot{C} + Aq.$
Carbonas Cupricus,	<i>Kupfer-Lazur</i> ,	$\ddot{C}u A^2 + 2 \ddot{C}u \ddot{C}^2.$

(↑)

~~15. CARBONO-SILICIAS: Cupricus *Kiesel Malachit.*~~

16. ARSENIATES: Arsenias Calcicus	1)	$\ddot{C}a \ddot{A}s + 4 Aq.$	1.
	2)	$\ddot{P}h a r m a c o l i t h u s \ddot{C}a \ddot{A}s + 6 Aq.$	2.
— Magnesicus, Picro	Pharmacolithus,	$\ddot{M} \ddot{A}s.$	1-
— [Ferroso-Ferricus	1)	$\ddot{S}c o r o d i t u s, \ddot{F}e \ddot{A}s + 2 \ddot{F}e \ddot{A}s + 12 Aq.$	1.
	2)	$\ddot{W} \ddot{u} r f e l s e n, \ddot{F}e^3 \ddot{A}s + 2 \ddot{F}e^3 \ddot{A}s^2 + 36 Aq.$	2.

(Ca³ M³)

Sub-Arseniis Cobalticus

Sub Arsenias Cobalticus,

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

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

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

2) *Linsenerz* 2.

3) *Olivenerz.* 3.

17. PHOSPHATES: Phosphas Yttricus



— Ferrosus 1) *Spathiges Eisenblau* $\ddot{F}e^2 \ddot{P}^3 + 12 Aq.$ 11.

2) — — $\ddot{F}e^4 \ddot{P}^3 + 16 Aq.$ 12.

3) terreus 13.

(↑)

Uranicum von blüthe

- Ferroso-Manganosus, *Phosphor-Mangan*, $\overset{\cdot\cdot}{\text{Mn}}^2\overset{\cdot\cdot}{\text{P}} + \overset{\cdot\cdot}{\text{Fe}}^2\overset{\cdot\cdot}{\text{P}}$.
- Cuprosus, a) (c *Ehrenbreitstein*) $\overset{\cdot\cdot}{\text{Cu}}^1\overset{\cdot\cdot}{\text{P}}^2 + 5\text{Aq}$.
 b) (c *Liebighen*) $\overset{\cdot\cdot}{\text{Cu}}^2\overset{\cdot\cdot}{\text{P}} + 2\text{Aq}$.
- Aluminicus a) *Vavellit* $\overset{\cdot\cdot}{\text{Al}}\overset{\cdot\cdot}{\text{P}}^3 + 12\text{Aq}$.
 b) *Lazulith* (?)
 δ) *Calait* $\overset{\cdot\cdot}{\text{Al}}\overset{\cdot\cdot}{\text{P}}^3 + 12\text{Aq}$.
- Aluminico-Lithicus, *Amblygonit* $\overset{\cdot\cdot}{\text{Li}}^2\overset{\cdot\cdot}{\text{P}} + \overset{\cdot\cdot}{\text{Al}}^4\overset{\cdot\cdot}{\text{P}}^3$.
- Aluminicus (cum Phosph. Ammon)? (ex insula Bourbon.)
- Calcico-Uranicus, *Uranit*, $\overset{\cdot\cdot}{\text{Ca}}^3\overset{\cdot\cdot}{\text{P}}^2 + 4\overset{\cdot\cdot}{\text{U}}\overset{\cdot\cdot}{\text{P}} + 48\text{Aq}$.
- Cuprico Uranicus, *Chalcolith*, $\overset{\cdot\cdot}{\text{Cu}}^3\overset{\cdot\cdot}{\text{P}}^2 + 4\overset{\cdot\cdot}{\text{U}}\overset{\cdot\cdot}{\text{P}} + 48\text{Aq}$.

18. SULPHATES: Sulphas Kalicus, (in fontibus mineralibus) $\overset{\cdot\cdot}{\text{K}}\overset{\cdot\cdot}{\text{S}}^2$.

- Natricus, *Thenardit*, $\overset{\cdot\cdot}{\text{Na}}\overset{\cdot\cdot}{\text{S}}^2$
- ——— cum aqua *Sal Glauberi*, $\overset{\cdot\cdot}{\text{Na}}\overset{\cdot\cdot}{\text{S}}^2 + 20\text{Aq}$
- Baryticus, *Spatum ponderosum* (*Schwerspath*), $\overset{\cdot\cdot}{\text{Ba}}\overset{\cdot\cdot}{\text{S}}^2$
- Barytico-Stronticus, $\overset{\cdot\cdot}{\text{Ba}}\overset{\cdot\cdot}{\text{S}}^2 + 5\overset{\cdot\cdot}{\text{Sr}}\overset{\cdot\cdot}{\text{S}}^2$.
- Stronticus, *Schützit* *Coelestin*, $\overset{\cdot\cdot}{\text{Sr}}\overset{\cdot\cdot}{\text{S}}^2$.
- Calcicus, *Anhydrit*, $\overset{\cdot\cdot}{\text{C}}\overset{\cdot\cdot}{\text{S}}^2$.
- Calcicus cum Aqua, *Gypsum*, $\overset{\cdot\cdot}{\text{C}}\overset{\cdot\cdot}{\text{S}}^2 + 4\text{Aq}$.
- Calcico Natricus, *Glauberit*, $\overset{\cdot\cdot}{\text{Na}}\overset{\cdot\cdot}{\text{S}}^3 + \overset{\cdot\cdot}{\text{C}}\overset{\cdot\cdot}{\text{S}}^2$
- Magnesticus, *Sal amarum*, $\overset{\cdot\cdot}{\text{M}}\overset{\cdot\cdot}{\text{S}}^2 + 12\text{Aq}$.