however being in any respect related to other silicates containing niobium. It has a certain similarity to the minerals of the clintonite group, but in most respects it is also very different from these.

Britholite, a new mineral,

by Chr. Winther.

This mineral, which G. Flink found in 1897 in the district of Julianehaab, South Greenland, was provisionally called by him «the cappelenitelike mineral» (Meddelelser om Grønland XIV, 245). It is found in the locality of Naujakasik as small brown, apparently hexagonal, prisms imbedded in the pegmatite of the nephelite-syenite which is to be found there.

The name has been formed from *βρῖθος*, weight, gravity on account of the mineral's high specific gravity.

Crystalline form. Several of the crystals are fully developed at both ends and their exterior appearance is exactly like a combination of the hexagonal prism $\{10\bar{1}0\}$ and pyramid $\{10\bar{1}1\}$, sometimes with small faces of the prism of second series $\{11\bar{2}0\}$.

If the crystals are therefore considered as belonging to the hexagonal system, they will have the axial ratio $\dot{c} = 0{\cdot}732$.

However by further examination it is quickly found, that this simple form is only apparent and that the crystals really are polysynthetic crystals of rhombic single individuals, the crystals having a somewhat similar form to that of the well-known aragonite crystals from Aragonia.

This was found from the fact, that the measurements of the angles gave very different values for the edge angles and it could be seen distinctly in the transverse sections, that every crystal consisted of a number of united individuals of another system of crystallization (optic biaxial). Experiments were

made in measuring angles on the transve
microscope, but without much success; ir
it could be positively determined, that it
that appeared, the edges were as a rule
off or in other ways damaged.

Among the numerous measured va
there are especially two, which appear fr
values are 28° 11′ and 30° 2′. On th
edge angles were frequently measured,
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Attention was then directed to the pos
a case, where the two above mentioned
other in a regular order and where th
was an angle of 90° between the two face
Such a case was found, as will be se
statement, which also shows the ordinar
of the edge angles:

$$
\begin{aligned}
a_1 : a_2 &= 25^\circ\,58' \\
a_2 : a_3 &= 32^\circ\,48' \\
a_3 : a_4 &= 25^\circ\,41' \\
a_4 : a_5 &= 28^\circ\,57' \\
a_5 : a_6 &= 34^\circ\,21' \\
a_6 : a_7 &= 31^\circ\,26' \\
a_7 : a_8 &= 31^\circ\,10' \\
a_8 : a_9 &= 31^\circ\,31' \\
a_9 : a_{10} &= 31^\circ\,43' \\
a_{10} : a_{11} &= 30^\circ\,7' \\
a_{11} : a_{12} &= 28^\circ\,5' \\
a_{12} : a_1 &= 28^\circ\,14'
\end{aligned}
$$

On the transverse sections, as abo
58° 13′, corresponding to $a_{10} : a_{12}$ abov
times and the optic axial plane was
angle with one of the faces, which in

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made in measuring angles on the transverse section under the microscope, but without much success; in the few cases, where it could be positively determined, that it was a single individual that appeared, the edges were as a rule more or less rounded off or in other ways damaged.

Among the numerous measured values for edge angles there are especially two, which appear frequently. The average values are 28° 11′ and 30° 2′. On the transverse sections edge angles were frequently measured, whose average value was the sum of the above mentioned angles, = 58° 13′. Attention was then directed to the possibility of discovering a case, where the two above mentioned angles followed each other in a regular order and where there at the same time was an angle of 90° between the two faces (rhombic pinacoids). Such a case was found, as will be seen from the following statement, which also shows the ordinary variation in the size of the edge angles:

$$
\begin{aligned}
a_1 : a_2 &= 25^\circ\,58' \\
a_2 : a_3 &= 32^\circ\,48' \\
a_3 : a_4 &= 25^\circ\,41' \\
a_4 : a_5 &= 28^\circ\,57' \\
a_5 : a_6 &= 34^\circ\,21' \\
a_6 : a_7 &= 31^\circ\,26' \\
a_7 : a_8 &= 31^\circ\,10' \\
a_8 : a_9 &= 31^\circ\,31' \\
a_9 : a_{10} &= 31^\circ\,43' \\
a_{10} : a_{11} &= 30^\circ\,\ 7' \\
a_{11} : a_{12} &= 28^\circ\,\ 5' \qquad \Big\} \; 89^\circ\,55' \\
a_{12} : a_1 &= 28^\circ\,14'
\end{aligned}
$$

On the transverse sections, as above mentioned, the angle 58° 13′, corresponding to $a_{10} : a_{12}$ above, was measured several times and the optic axial plane was found to make a right angle with one of the faces, which included this angle. The

conclusion arrived at is therefore, that the optic axial plane makes a right angle with a_{12} and an ideal transverse section of a single crystal will accordingly appear as shown on the figure:

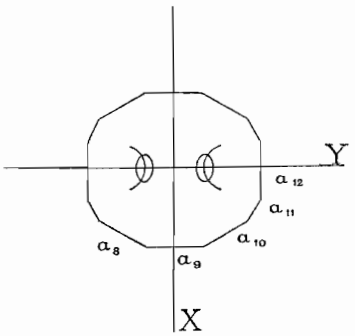

Fig. 2. Britholite.

The pyramidal faces on the apparently hexagonal crystal are partly brachydomes, partly real pyramidal faces. The larger ones among them are almost always brachydomes. The pyramidal faces are rare and belong always to the face a_{10}.

The faces on the separate individuals, which were examined, are the following:

{010} {110} {130} {021} {111}

and the following angles are measured:

		Calculated
(010) : (110)	= *58° 13′	—
(010) : (130)	= 28° 11′	28° 17′
(021) : (010)	= *49° 48′	—
(111) : (110)	= c. 51°	51° 16′

From this the following calculation is made:

$$\breve{a} : \overline{b} : \dot{c} = 0{\cdot}620 : 1 : 0{\cdot}423.$$

To understand the law, according to
hexagonal crystal is built of rhombi
be remembered, that the angle between
two faces, which most frequently appear,
The examination of the hexagonal transv
that the optic axial plane in the far pr
cases makes a right angle with the side
accordingly belong to the brachypinacoid
the hexagon a little of the prismatic face
after which the side-line is slightly bent (6
because the next individual's brachypi
Schematically the «hexagonal» prism th
rhombic individuals, whose optic axial p
crystal's middle-line. The prismatic face
contact between the separate individuals.

On the edge between {110} and {01
the prismatic face {130}; it is this one,
gonal» prism has the appearance of
series.

This way of formation could in sin
the outside of the «hexagonal» pris
itself especially distinctly, when the bra
appending brachydome on the one indivi
in front of the next individual's prism a
was very seldom however, that both the
so distinct, that a measurement could b
a crystal was examined in transverse se
directly observing it, as if the individual
in a parallel position, as the angle most f
very near 60°, however on determining
optic axial planes, it was found, that th
constructed in conformity with the above

Physical properties. The mineral is
Luster from greasy to vitreous. The doub

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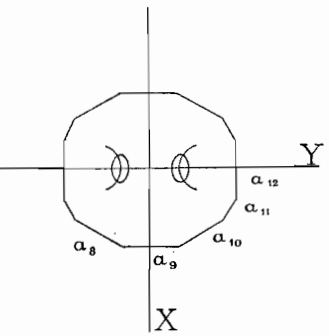

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: (130)	= 28° 11′	28° 17′
: (010)	= *49° 48′	—
: (110)	= c. 51°	51° 16′

following calculation is made:

$\dot{a} : \bar{b} : \dot{c} = 0{\cdot}620 : 1 : 0{\cdot}423.$

To understand the law, according to which the apparently hexagonal crystal is built of rhombic individuals, it must be remembered, that the angle between (110) and (010), the two faces, which most frequently appear, is 58° 13′ or near 60°. The examination of the hexagonal transverse sections showed, that the optic axial plane in the far predominant number of cases makes a right angle with the side-lines and that these accordingly belong to the brachypinacoids. At the corners of the hexagon a little of the prismatic face generally shows itself, after which the side-line is slightly bent (60° — 58° 13′ = 1° 47′), because the next individual's brachypinacoid then begins. Schematically the «hexagonal» prism then consists of 6 single rhombic individuals, whose optic axial planes all meet in the crystal's middle-line. The prismatic face {110} is the plan of contact between the separate individuals.

On the edge between {110} and {010} appears sometimes the prismatic face {130}; it is this one, which on the «hexagonal» prism has the appearance of the prism of second series.

This way of formation could in single cases be seen on the outside of the «hexagonal» prism itself. It showed itself especially distinctly, when the brachypinacoid and the appending brachydome on the one individual protruded a little in front of the next individual's prism and pyramidal face. It was very seldom however, that both these sets of faces were so distinct, that a measurement could be made. When such a crystal was examined in transverse section, it seemed on directly observing it, as if the individuals had joined together in a parallel position, as the angle most frequently appearing is very near 60°, however on determining the position of the optic axial planes, it was found, that these crystals also are constructed in conformity with the above mentioned law.

Physical properties. The mineral is brown and opaque. Luster from greasy to vitreous. The double refraction is slight.

The crystals are optically negative. The acute bisectrix is $\neq$ the vertical axis. The angle of the optic axes is small, but could not be measured exactly, as the plates had to be made very thin to be transparent. The optic orientation is:

$$\breve{a} = \mathfrak{b}$$
$$\bar{b} = \mathfrak{c}$$
$$\dot{c} = \mathfrak{a}$$

The hardness is $5^1/_2$. The fracture is uneven. There is no traceable cleavage.

The specific gravity by means of a pyknometer was found to be 4·446.

Chemical properties. The chemical analysis was made by cand. polyt. Chr. Christensen, who states as follows:

«The mineral was evaporated in a water-bath with nitric acid. After treatment with warm water the silica was filtrated, evaporated with hydrofluoric and sulphuric acid and the residue was then added to the filtrate. Phosphoric acid was then precipitated with ammonium molybdate. To the filtrate ammonia and ammonium sulphide were added. The precipitated hydroxides and sulphides were dissolved in hydrochloric acid, then evaporated to expel hydrochloric acid, diluted and precipitated with oxalic acid. The oxalate of cerium was ignited and weighed. The oxide was dissolved in hydrochloric acid together with a fixed quantity of ferrous salt and the remainder which was not oxidized was titrated with potassium permanganate. By these experiments an excess of oxygen (over Ce_2O_3) was found.»

«Ferric oxide, manganous oxide, and the oxides of magnesium, calcium and sodium were determined in the usual manner after the molybdenum had been precipitated with hydrochloric acid.»

«The fluorine was determined by Berzelius & Rose's method.»

«The water was determined b
carbonate, collected and weighed in
The composition was found to be:

	per cent found		eq
SiO_2	16·77		
P_2O_5	6·48		
$(Ce, La, Di)_2O_3$	60·54	60·97	
Fe_2O_3	0·43		
CaO	11·28	11·41	
MgO	0·13		
Na_2O	1·85		
H_2O	1·27		
F	1·33		
	100·08		

The proportion between acid and
are, when phosphoric acid is included
Of the different, possible combinat
tainly be preferred, where the phospho
be combined with the cerium (or lanth
in monacite.

If now the fluorine is supposed to b
the following formula is arrived at:

$$3\,[4\,SiO_2 \cdot 2\,(Ce, La, Di, Fe)_2O_3 \cdot 3\,(Ca, Mg)\,O \cdot$$

From this formula the percentages ar
quoted in the last column of the above

Occurrence. The pegmatitic rock,
is found, contains as principal cor
eudialyte, white feldspar, steenstrupite,
aegyrite. The britholite crystals, wh
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$\breve{a} = b$
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the molybdenum had been precipitated
cid.»
vas determined by Berzelius & Rose's

«The water was determined by ignition with sodium carbonate, collected and weighed in calcium chloride tubes.»

The composition was found to be:

	per cent found		equivalents	per cent calculated
SiO_2	16·77		27·95	16·70
P_2O_5	6·48		4·56	6·59
$(Ce, La, Di)_2O_3$	60·54	60·97	18·46	60·90
Fe_2O_3	0·43		0·27	
CaO	11·28	11·41	20·14	11·18
MgO	0·13		0·32	
Na_2O	1·85		2·98	2·06
H_2O	1·27		7·06	1·25
F	1·33		7·00	1·32
	100·08			100·00

The proportion between acid and basic atoms of oxygen are, when phosphoric acid is included 78 : 83·4.

Of the different, possible combinations the one must certainly be preferred, where the phosphoric acid is supposed to be combined with the cerium (or lanthanum or didymium) as in monacite.

If now the fluorine is supposed to be combined with sodium, the following formula is arrived at:

$$3\left[4\,SiO_2 \cdot 2\,(Ce, La, Di, Fe)_2O_3 \cdot 3\,(Ca, Mg)\,O \cdot H_2O \cdot NaF\right] 2\left[P_2O_5 \cdot Ce_2O_3\right].$$

From this formula the percentages are calculated, which are quoted in the last column of the above table.

Occurrence. The pegmatitic rock, in which the britholite is found, contains as principal components: arfvedsonite, eudialyte, white feldspar, steenstrupite, nephelite, sodalite and aegyrite. The britholite crystals, which on an average are one centimeter in length, are found with a fully developed crystal

form in all these minerals. It is most frequently found in arfvedsonite, through which it passes in all directions.

By examining the thin sections it was found, that the britholite is penetrated by aegyrite-needles, which are not placed in distinct positions in reference to the separate britholite individuals.

Among the single individuals a grayish brown amorphous substance is often found, probably a product of alteration of the britholite. In some cases this substance ramifies into the single individuals and makes the transverse sections opaque, even at a very small thickness of the sections.

Schizolite, a new mineral.

By Chr. Winther.

This mineral, which G. Flink found in 1897 in the Julianehaab district in South Greenland, was provisionally designated by him as «pink columns» (Meddelelser om Grønland XIV, 257). It is found in the locality of Tutop Agdlerkofia in grained albite. Besides a column of this mineral, embedded in the pegmatite from the nephelite-syenite which exists at Kangerdluarsuk, is found on a single piece in Flink's collection from that locality.

The new mineral, on account of its properties, is allied to the pectolite group and may best be characterised as an especially manganous species of the same.

The name has been formed from $\sigma\chi\acute{\iota}\zeta\omega$, cleave, on account of the minerals marked cleavage.

Physical properties. The schizolite appears as prismatic columns varying from pink to brown, which are found partly separate, partly in radially columnar groups spread in the mass of grained albite. The color is originally quite light red, but by alteration it becomes more brownish. The columns are varying

from semitransparent to opaque, all ac
has an imperfect vitreous luster. A
the mineral is a very marked cleavage
with the length of the columns.

Fully developed crystals were not fo
which were striated both lengthwise and
tion of pieces cleaved off shows par
cleavage faces. The average value of
cleavage faces is 85° 32′.

The cleavage is so perfect and th
after many unsuccessful trials, all atte
verse sections of the columns was g
then happened, that a thin plate was
angle with the length of the columns;
plate showed, that the extinction-direct
angle between the cleavage planes. Th
monoclinic and the length parallel v

Taking into consideration the crys
lite, the cleavage-planes were chose
pinacoid. On the striated pieces combi
corresponding to two orthodomes and

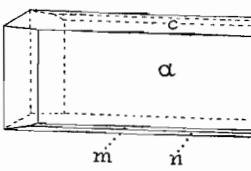

Fig. 3. Schizolit

The measured angles are:

Fo

$a : m = (100) : (20\bar{1}) = 28°$
$a : n = (100) : (10\bar{1}) = *50°$
$a : h = (100) : (610) = *10°$
$c : n' = (001) : (\bar{1}01) = *43°$
$c : m' = (001) : (\bar{2}01) = 65°$