

III. Notes of a Comparison of the Granites of Cornwall and Devonshire with those of Leinster and Mourne." By the Rev. SAMUEL HAUGHTON, M.D., D.C.L., F.R.S., Fellow of Trinity College, Dublin. Received December 18, 1868.

The granites of Mourne are eruptive, and can be proved to contain albite as their second felspar.

The granites of Leinster are also eruptive; and although albite has never yet been actually found to occur in them, its existence can be inferred with considerable probability.

During the past summer (1868) I have succeeded in proving that the second felspar that occurs in the granites of Cornwall is albite. I found this mineral as a constituent of the granite at Trewavas Head, where it has the following composition:—

I. *Albite, var. Cleavelandite (Trewavas Head).*

Silica	65·76
Alumina	21·72
Lime..	0·89
Magnesia	trace
Soda.....	9·23
Potash	1·76
Water.....	0·40
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	99·76

This albite is opaque, cream-coloured, lamellar, and associated with quartz and orthoclase, which has the following composition:—

II. *Orthoclase (Trewavas Head).*

	No. 1*.	No. 2†.
Silica	63·60	63·20
Alumina	21·04	21·00
Iron and manganese oxides ...	trace	trace
Lime	0·90	0·68
Magnesia.....	trace	trace
Soda	3·08	2·75
Potash	9·91	10·30
Water.....	0·40	0·40
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	98·93	98·33

The granites of Cornwall and Devon contain two micas, white and black. I was fortunate enough to obtain, through my friend Mr. W. J. Henwood, F.R.S., of Penzance, a sufficient quantity of white mica from Tremearne, near Trewavas Head, to determine accurately its composition, which proves to be highly interesting. It differs essentially from the white mica of Leinster and Donegal, and proves to be a variety of lepidolite.

* From veins at foot of cliff associated with Cleavelandite albite.

† From the granite at summit of cliff.

III. *White Mica, Lepidolite (Tremearne, near Trewavas Head).*

Silica, SiO_3	47·60
Fluosilicon, SiF_3	5·68
Alumina	27·20
Iron peroxide'	5·20
Manganese protoxide	1·20
Lime	0·45
Magnesia	trace
Potash.....	10·48
Soda	0·72
Lithia	1·14
	<hr/> 99·67

This lepidolite is white, pearly, and occurs in rhombic tables of 60° and 120° . Its oxygen ratios are, reckoning for the fluorine its equivalent of oxygen,—

Oxygen Ratios.

Silica	24·714	} 26·461	8·9
Fluosilicon	1·747		
Alumina	12·713	} 14·270	4·8
Iron peroxide	1·557		
Manganese protoxide ..	0·268	} 2·982	1·00
Lime	0·127		
Magnesia		
Potash	1·776		
Soda	0·184		
Lithia	0·627		

This corresponds with a theoretical formula, in which the oxygen of the silica is to that of the bases as 3 : 2.

The Black Mica of the Cornish granites seems to be more abundant than the White Mica already described. I found a sufficient quantity of it at Coron Bosavern, near St. Just, to enable me to make the following analysis:—

IV. *Black Mica, Lepidomelane (Coron Bosavern, near St. Just).*

Silica (SiO_3)	39·92
Fluosilicon (SiF_3)	3·04
Alumina	22·88
Iron peroxide	15·02
Iron protoxide.....	2·32
Manganese protoxide	1·40
Lime	0·68
Magnesia	1·07
Potash.....	9·76
Soda	0·99
Lithia	1·71

98·79

The Black Mica of St. Just is of a blackish-bronze colour and metallic lustre, and occurs in rhombs of 60° and 120° angles. Its oxygen ratios are, reckoning for the fluorine its equivalent of oxygen,—

Oxygen Ratios.

Silica	20·727	} 21·645
Fluosilicon	0·918	
Alumina	10·692	} 15·092
Iron peroxide	4·400	
Iron protoxide	0·514	} 4·292
Manganese protoxide....	0·310	
Lime	0·192	
Magnesia	0·427	
Potash	1·655	
Soda	0·254	
Lithia	0·940	

The oxygen ratio of this iron-potash Mica (which is undoubtedly a lepidomelane) for silica and bases is

$$216 : 194, \text{ or } 1 : 1.$$

The granites of Cornwall and Devon, which have been frequently examined by me during the last sixteen years, appear all to contain the two felspars and the two micas above analyzed. In a future communication I hope to describe their composition in detail, and to give a comparison of this composition with that of the granites of Ireland.

The following generalizations will be found, as I believe, capable of proof.

(1) The granites of Ireland may be divided into two distinct classes, marked by characters both geological and mineralogical.

(2) The First Class of granites consists of Eruptive rocks, of ages varying from the Silurian to the Carboniferous periods. To this class may be referred the granites of Leinster and Mourne, and the granites of Cornwall and Devon.

(3) The First Class of granites is characterized by the presence of orthoclase and albite, and by the absence of all the Lime Felspars.

(4) The Second Class of granites consists of Metamorphic rocks, of unknown geological age, but probably subsequent to the Laurentian period. To this class may be referred the granites of Donegal and Galway, and the granites of Scotland, Norway, and Sweden.

(5) The Second Class of granites is characterized by the presence of orthoclase and oligoclase, or Labradorite, or some other of the Lime Felspars, and by the absence of albite.