

NATAL MUSEUM.

CATALOGUE

OF A

COLLECTION OF ROCKS AND
MINERALS

FROM NATAL AND ZULULAND,

ARRANGED STRATIGRAPHICALLY.

BY

F. H. HATCH, Ph.D., F.G.S.,

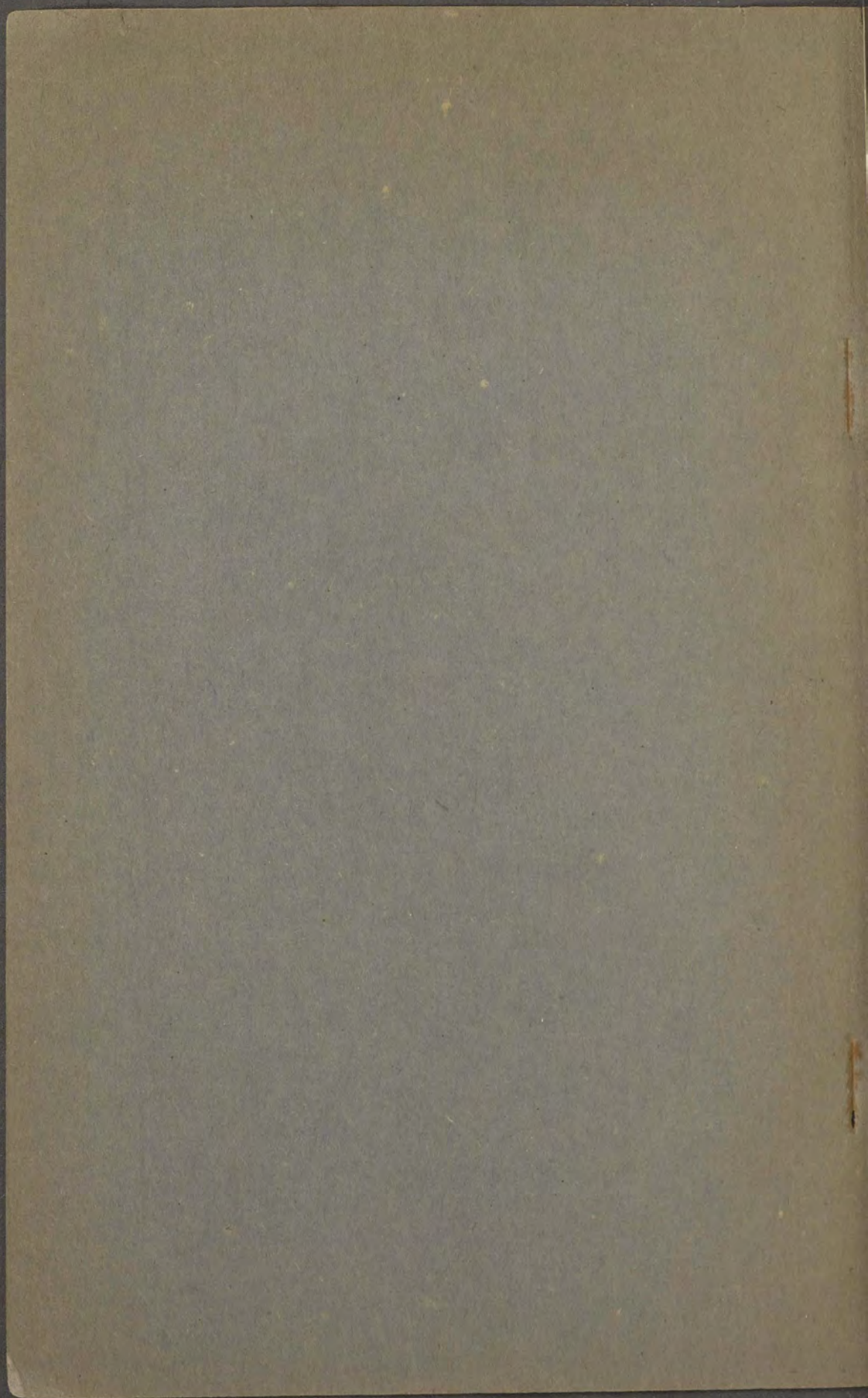
Mem. Inst. C.E., Mem. Inst. Min. and Met.,

Consulting Mining Engineer to the Government of Natal.

CITY PRINTING WORKS, BANK STREET,
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1900.

[PRICE ONE SHILLING.]



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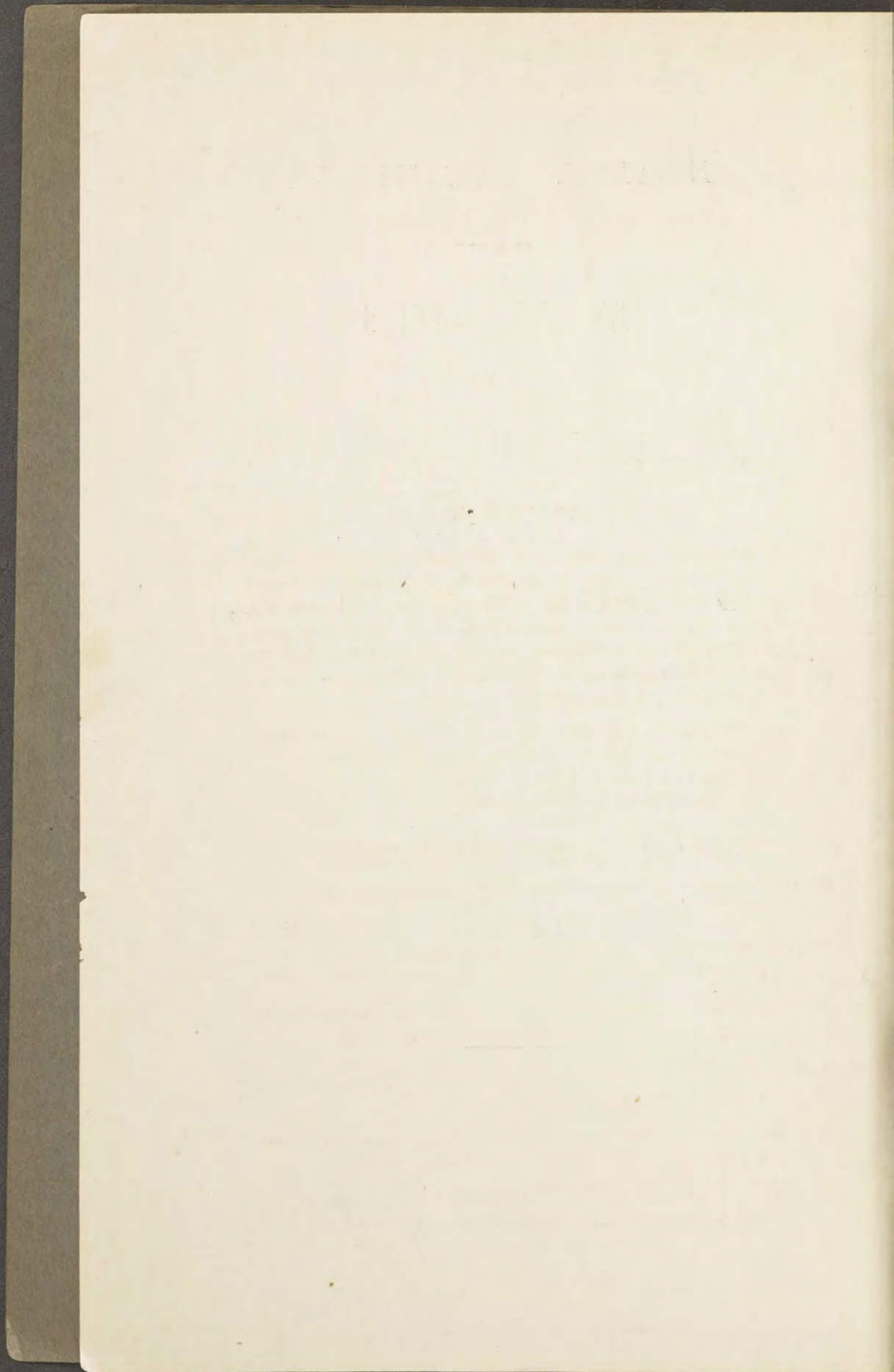
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Mineral zone (Marcus Engle)

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INTRODUCTION.

THE specimens here catalogued were collected during a tour of investigation made by me, during the winter months of the present year, through the mineral districts of Natal and Zululand. The collection is a duplicate of one which I propose to present to a London Museum, probably that of the Imperial Institute. Full details as to the mineral occurrences will be found in my report to the Natal Government.

The arrangement adopted for the rocks is partly stratigraphical and partly topographical, while the ores and minerals are placed with the rocks in which they occur. Beginning with the oldest rocks, the order of arrangement is as follows:—

(I.) METAMORPHIC ROCKS. SWAZILAND SYSTEM.

Mfongosi Series—Micaceous and chloritic schists of the Mfongosi Valley, etc.

Buffalo River and Insuzi Series.—Quartzites, conglomerates, grits and schists of the Buffalo River and Insuzi Valleys.

Nkandhla Forest Series.—Mica schists, kyanite schists and quartz schists of the Nkandhla Forest and Bobe Ridge.

Tugela River Series.—Schists, largely hornblendic, of the Lower Tugela.

Mpapala Series.—Chiefly hornblendic schists with aplite and dykes and quartz veins.

Fort Yolland Series.—Chiefly hornblendic schists with aplite and pegmatite veins and serpentine intrusions.

INTRODUCTION.

Vryheid Series.—Conglomerates, quartzites and schists of the Vryheid District (Barberton formation of Molengraaff).

Metamorphic Limestones.

(II.) GRANITES INTRUSIVE IN THE METAMORPHIC ROCKS OF THE SWAZILAND SYSTEM.

(III.) WATERBERG OR TABLE MOUNTAIN SANDSTONE.

(IV.) ROCKS OF THE KARROO SYSTEM.*

Dwyka Conglomerate Series.

Ecce Shales.

Ecce Sandstones.

Dolerite Intrusions.

(V.) SURFACE DEPOSITS.

Surface Limestones.

Surface Ironstones.

The true relationship of the different series of rocks grouped under the heading Swaziland System is too complex to be unravelled in the short space of time I have been able to devote to their study. Only detailed geological mapping will disclose their proper sequence. My studies, however, have sufficed to show that they are members of one great system of metamorphic rocks and that the separation and correlation of certain units as Fundamental Gneiss, Witwatersrand Beds, Black Reef Series, etc., which have been proposed by some observers do not appear to be warranted by the facts.

With regard to the age of the Swaziland System there can be little doubt that the rocks grouped hereunder are not younger than the pre-Cambrian of European classification, and possibly correspond to the Huronian of Canada or the Algonkian of Lake Superior; but the only age limitation we have to guide us is

* Beaufort and Stormberg Beds are not represented in the collection as I had no opportunity of visiting the districts in which the rocks of these series occur. Nor are the coals of the Colony represented, as the coal deposits were excluded from the purview of my report.

INTRODUCTION.

the fact that they are over-laid unconformably by the Waterberg or Table Mountain Sandstone which, on the evidence of fossils, is correlated with the Devonian System of Europe.

The correlation of the red sandstones and conglomerates of Natal with the Table Mountain Sandstone of Cape Colony was first suggested by Sutherland and afterwards adopted by Anderson. On the other hand, those who have seen both the Waterberg Sandstone of the Transvaal and the red sandstones and conglomerates of Natal cannot doubt their identity; and thus support is lent to the correlation of the Waterberg Sandstone with the Table Mountain Sandstone of the Cape, suggested by Dr. Corstorphine and myself in 1905.*

The nomenclature of the coal-bearing sandstone formation of Natal is a difficulty of old standing: the formation lies conformably between the Ecca Shales and the reptilian sandstones of the Beaufort Beds. I have followed Anderson in classing it with the Ecca rather than with the Beaufort Beds.

The arrangement of the ore and the mineral specimens has been a difficulty. I have adopted the principle of arranging them as far as possible with the rocks with which they are associated.

I have received much valuable assistance in the collecting and dressing of the specimens from Mr. A. Cowley, who accompanied me throughout my tour, and from Messrs. F. W. Penny and W. Cullingworth in the labelling of the specimens and their arrangement in the cases.

F. H. HATCH.

Pietermaritzburg,
November, 1909.

* "The Geology of South Africa." London, 1905.

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CATALOGUE OF ROCKS AND MINERALS
COLLECTED IN NATAL AND ZULULAND BY
DR. F. H. HATCH.

METAMORPHIC ROCKS. SWAZILAND SYSTEM.

Mfongosi Series: Micaceous and Chloritic Schists of the
Mfongosi Valley, Etc.

1. **Chlorite Schist (Mfongosi Schists.)**

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 34.]

2. **Chlorite Schist (Mfongosi Schists.)**

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 28.]

3. **Chlorite Schist (Mfongosi Schists.)**

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 35.]

4. **Schist (Mfongosi Schists.)**

Loc: Tugela River Drift, near Ngobevu, Zululand.

[Hatch Coll. '09. No. D. 383.]

5. **Schist (Mfongosi Schists.)**

Loc: Tugela River Drift, near Ngobevu, Zululand.

[Hatch Coll. '09. No. D. 370.]

6. **Schist (*Mfongosi Schists.*)**

Loc: Spur of Qudeni, near Makazane Hill, Zululand.

[Hatch Coll. '09. No. D. 369.]

7. **Quartz Stringers in Schist.**

Loc: No. 3 Adit, Tugela Gold Mine, Tugela River, Zululand.

[Hatch Coll. '09. No. P.D. 49.]

8. **Quartz Schist (*Mfongosi Schists.*)**

Loc: No. 3 Adit, Tugela Gold Mine, Tugela River, Zululand.

[Hatch Coll. '09. No. P.D. 47.]

9. **Schist (*Mfongosi Schists.*)**

Loc: Footwall, trench, Household's Reef, Golden Dove Mine, Ngobevu, Tugela River, Zululand.

[Hatch Coll. '09. No. D. 181.]

10. **Schist (*Mfongosi Schists.*)**

Loc: Adit, Golden Dove Mine, Ngobevu, Tugela River, Zululand.

[Hatch Coll. '09. No. D. 116.]

11. **Schist (*Mfongosi Schists.*)**

Loc: Golden Dove Mine, Ngobevu, Tugela River, Zululand.

[Hatch Coll. '09. No. D. 117.]

12. **Schist with Quartz Vein.**

Loc: Goodricke's Old Copper Claims, at bend of Tugela River, near Ngobevu, Zululand.

[Hatch Coll. '09. No. D. 138.]

13. **Schist (*Mfongosi Schists.*)**

Loc: Garbe's Galena Claims, Mfongosi Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 377.]

14. **Schist (Mfongosi Schists.)**

Loc: Mfongosi Valley, Qudeni, Zululand

[Hatch Coll. '09. No. D. 379.]

15. **Schist (Mfongosi Schists.)**

Loc: Head of Malengeni Spruit, branch of Manyani, 1 mile W. of Intingwe Store, Zululand.

[Hatch Coll. '09. No. D. 290.]

Quartzites, Grits, Conglomerates and Schists of the Buffalo River, Insuzi Valley, Etc.

16. **Sericite Schist (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 162.]

17. **Schist with Pebbles of Granite, Quartz, &c.**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 167.]

18. **Felspathic Grit (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. B. 93.]

19. **Quartzite (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 158.]

20. **Quartzite (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 168.]

21. **Felspathic Grit (Buffalo River Series.)**

Loc: At Drift, Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. B. 101a.]

22. **Conglomerate (Buffalo River Series.)**

Loc: Buffalo River, Goodricke's Claims.

[Hatch Coll. '09. No. D. 170.]

23. **Conglomerate (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 160.]

24. **Felspathic Quartzite (Buffalo River Series.)**

Loc: Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. B. 76.]

25. **Talc Schist (Buffalo River Series.)**

Loc: Mlambomunye Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 109.]

26. **Schist (Buffalo River Series.)**

Loc: On road from Mlambomunye to the lower slopes of the Qudeni, above the Buffalo River Gorge, Zululand.

[Hatch Coll. '09. No. D. 89.]

27. **Quartzite (Buffalo River Series.)**

Loc: Mlambomunye Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 106.]

28. **Conglomerate (Buffalo River Series.)**

Loc: Mlambomunye Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 16.]

29. **Quartzite (Buffalo River Series.)**

Loc: Head of Mfongosi Valley, under brow of Enkonyeni Mountain.

[Hatch Coll. '09. No. D. 313.]

30. **Conglomerate (Insuzi Series.)**

Loc: Speedwell North Reef. Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 298.]

31. **Conglomerate (Insuzi Series.)**

Loc: Speedwell North Reef, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 234.]

32. **Conglomerate (Insuzi Series.)**

Loc: Central Insuzi, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 301.]

33. **Quartzite (Insuzi Series.)**

Loc: No. 2 Main Incline, Central Insuzi, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 257.]

34. **Conglomerate (Insuzi Series.)**

Loc: Delaney Reef, Central Insuzi, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 330.]

35. **Conglomerate (Insuzi Series.)**

Loc: Delaney Reef, Central Insuzi, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 327.]

36. **Quartzite (Insuzi Series.)**

Loc: Incline Shaft, Speedwell South Reef, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 261.]

37. **Conglomerate (Insuzi Series.)**
Loc: Central Insuzi Claims, Insuzi Valley, Zululand.
[Hatch Coll. '69. No. D. 232.]
38. **Amygdaloid (Insuzi Series.)**
Loc: Near Delaney Reef, Central Insuzi Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 317.]
39. **Amygdaloid (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 337.]
40. **Amygdaloid (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 300.]
41. **Schist (Insuzi Series.)**
Loc: Footwall of conglomerate in House Shaft. Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 239.]
42. **Schist (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 255.]
43. **Quartzite (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 302.]
44. **Conglomerate (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 340.]

45. **Conglomerate (Insuzi Series.)**
Loc: Stope, Dickson's Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 280.]
46. **Conglomerate (Insuzi Series.)**
Loc: "Bridle Path Reef," Dickson's Claims, Insuzi Valley,
Zululand.
[Hatch Coll. '09. No. D. 263.]
47. **Conglomerate (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 308.]
48. **Conglomerate (Insuzi Series.)**
Loc: Dickson's Claims, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 203.]
49. **Conglomerate (Insuzi Series.)**
Loc: Dickson's Claims. Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 247.]
50. **Conglomerate (Insuzi Series.)**
Loc: Moore's Reef, near Cooper's Store, Umhlatuze River,
Zululand.
[Hatch Coll. '09. No. D. 294.]
51. **Quartzite (Insuzi Series.)**
Loc: Footwall, Moor's Reef, near Cooper's Store, Umhlatuze
River, Zululand.
[Hatch Coll. '09. No. D. 209.]
52. **Conglomerate (Insuzi Series.)**
Loc: 35ft, Shaft. Moore's Reef, near Cooper's Store, Um-
hlatuze River, Zululand.
[Hatch Coll. '09. No. B. 135.]

53. **Conglomerate (Insuzi Series.)**
Loc : 35ft. Shaft. Mocre's Reef, near Cooper's Store, Umhlataze River, Zululand. [Hatch Coll. '09. No. B. 135.]
54. **Schist (Sheared Amygdaloid.)**
Loc : 1 mile S. of Cooper's Store, Umhlataze River, Zululand. [Hatch Coll. '09. No. T.D. 125.]
55. **Chlorite Schist (Insuzi Series.)**
Loc : Mquemi River, 3 miles from Empandhleni Magistracy, Zululand. [Hatch Coll. '09. No. T.D. 196.]
56. **Chlorite Schist (Insuzi Series.)**
Loc : Hartley Cooper's Claims, from hanging wall of Reef, 50ft. shaft. Mquemi River, 3 miles from Empandhleni Magistracy, Zululand. [Hatch Coll. '09. No. T.D. 151.]

Ore Deposits.

57. **Schist (Insuzi Series.)**
Loc : Country Rock of Vein. Gem Copper Mine, Insuzi Valley, Zululand. [Hatch Coll. '09. No. B. 155.]
58. **Schist (Insuzi Series.)**
Loc : Country Rock of Vein. Gem Copper Mine, Insuzi Valley, Zululand. [Hatch Coll. '09. No. B. 155.]
59. **Dyke.**
Loc : Gem Copper Mine, Insuzi Valley, Zululand. [Hatch Coll. '09. No. D. 295.]

60. **Dyke.**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 334.]
61. **Copper Ore (Copper Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 275.]
62. **Copper Ore (Chalcopyrite and Malachite.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 312.]
63. **Copper Ore (Copper Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 309.]
64. **Copper Ore (Copper Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 276.]
65. **Copper Ore (Copper Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 276.]
66. **Copper Ore (Copper Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 310.]
67. **Copper Ore (Malachite and Glance.)**
Loc : Gem Copper Mine, Insuzi Valley, Zululand.
[Hatch Coll. '09. No. D. 284.]

68. **Copper Ore (*Malachite and Glance.*)**

Loc: Gem Copper Mine, Insuzi Valley, Zululand.

[Hatch Coll. '09. No. D. 284.]

69. **Schist (*Mfongosi Schists.*)**

Loc: McKenzie's Copper Claims, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. B. 208.]

70. **Schist (*Mfongosi Schists.*)**

Loc: Hanging wall rock of McKenzie's Copper Reef, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. D. 322.]

71. **Schist (*Mfongosi Schists.*)**

Loc: Footwall rock of McKenzie's Copper Reef, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. D. 321.]

72. **Copper Ore (*Glance and Malachite.*)**

Loc: McKenzie's Copper Claims, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. D. 326.]

73. **Copper Ore (*Glance and Malachite.*)**

Loc: McKenzie's Copper Claims, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. D. 323.]

74. **Copper Ore (*Glance and Malachite.*)**

Loc: McKenzie's Copper Claims, Mfongosi Valley, Zululand.

[Hatch Coll. '09. No. D. 325a.]

75. **Copper Ore (*Glance and Malachite.*)**

Loc: Outcrop. McKenzie's Claims, Natal side of Tugela River.

[Hatch Coll. '09. No. B. 279.]

76. **Copper Ore (*Glance and Malachite.*)**
Loc: Outerop. McKenzie's Claims, Natal side of Tugela River.
[Hatch Coll. '09. No. B. 284.]
77. **Copper Ore (*Glance and Malachite.*)**
Loc: Outerop. McKenzie's Claims, Natal side of Tugela River.
[Hatch Coll. '09. No. B. 283.]
78. **Copper Ore (*Chalcopyrite and Malachite.*)**
Loc: Dickinson's Copper Reef, Mlambomunye Valley, Buffalo River.
[Hatch Coll. '09. No. D. 378.]
79. **Copper Ore (*Chalcopyrite and Malachite.*)**
Loc: Goodricke's old Copper Claims at bend of Tugela River, near Ngobevu, Zululand.
[Hatch Coll. '09. No. B. 398.]
80. **Copper Ore (*Chalcopyrite and Malachite.*)**
Loc: Goodricke's old Copper Claims at bend of Tugela River, near Ngobevu, Zululand.
[Hatch Coll. '09. No. D. 149.]
81. **Galena.**
Loc: Garbe's Galena Claims, Mfongosi Valley, Qudeni, Zululand.
[Hatch Coll. '09. No. D. 347.]
82. **Galena.**
Loc: Garbe's Galena Claims, Mfongosi Valley, Qudeni, Zululand.
[Hatch Coll. '09. No. P.D. 23.]
83. **Galena.**
Loc: Ngobevu Valley, Tugela River, Zululand.
[Hatch Coll. '09. No. D. 199.]

84.

Galena.*Loc*: Ngobevu Valley, Tugela River, Zululand.

[Hatch Coll. '09. No. B. 78.]

85.

Galena.*Loc*: Ngobevu Valley, Tugela River, Zululand.

[Hatch Coll. '09. No. B. 78.]

86.

Copper-Bearing Syenite.*Loc*: Umbizwa River, Itala Mountain, Zululand.

[Hatch Coll. '09. No. D. 270.]

87.

Schist (casing of Syenite.)*Loc*: Goodricke's Claims, Buffalo River, Zululand.

[Hatch Coll. '09. No. P.D. 7.]

88.

Copper Ore (Malachite.)*Loc*: Reynold's Shaft, 'Syenite' Lode, Goodricke's Claims, Buffalo River, Zululand.

[Hatch Coll. '09. No. P.D. 13.]

89.

Dyke.*Loc*: E. Drive 100 ft. level, Main Shaft, Goodricke's Claims, Buffalo River.

[Hatch Coll. '09. No. D. 103.]

90.

Schist (Sheared Dyke.)*Loc*: E. Drive 100 ft. level, Main Shaft, Goodricke's Copper Claims, Buffalo River.

[Hatch Coll. '09. No. D. 102.]

91.

Quartzite at Contact with Dyke.*Loc*: N. side of Crosscut, Goodricke's Claims, Buffalo River, Zululand.

[Hatch Coll. '09. No. D. 105.]

92. **Copper Ore (Peacock Copper with Galena.)**

Loc : Goodricke's Claims, Buffalo River, Zululand.

[Hatch Coll. '09. No. P.D. 1.]

93. **Copper Ore (Peacock Copper.)**

Loc : Goodricke's Claims, Buffalo River, Zululand.

[Hatch Coll. '09. No. P.D. 3.]

94. **Quartzite.**

Loc : Bottom of East Shaft, Cooper's Claims, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 227.]

95. **Syenite with Malachite.**

Loc : Near Government Borehole, Gasset's Gap, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. B. 136a.]

96. **Syenite with Malachite.**

Loc : 12 ft. Shaft, Cooper's Claims, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. P.D. 68.]

97. **Syenite with Malachite on Joint Faces.**

Loc : Cooper's Claims, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. P.D. 19.]

98. **Syenite (Hornblendic Variety.)**

Loc : Near Government Borehole, Gasset's Gap, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 233a.]

99. **Dyke in Syenite with Glance and Malachite.**

Loc : Cooper's Claims, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 225.]

100.

Serpentine.

Loc: Dyke between Quartzite and "Calico Rock," near Cooper's Store, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 296.]

101.

Serpentine (with Garnierite.)

Loc: Near Cooper's Store, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 214.]

102.

Chromite.

Loc: Tugela Rand, Krantzkop.

[Hatch Coll. '09. No. T.R. 1.]

103.

Breccia associated with the "Calico Rock."

Loc: Near Cooper's Store, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 299.]

104.

Iron Ore ("Calico Rock.")

Loc: Near Cooper's Store, Umhlatuze River, Zululand.

[Hatch Coll. '09. No. D. 259.]

105.

Iron Ore (Specular Iron.)

Loc: Top of Isibudeni Peak, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 185.]

106.

Iron Ore (Haematite.)

Loc: Top of Isibudeni Peak, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. P.D. 88.]

107.

Iron Ore (Haematite.)

Loc: Top of Isibudeni Peak, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 147.]

108. **Iron Ore (Haematite.)**
Loc: Top of Isibudeni Peak, Nkandhla Forest, Zululand.
[Hatch Coll. '09. No. T.D. 155.]
- Large Specimens at bottom of case.
109. **Laminated Quartz and Schist.**
Loc: Scottish Lode, Golden Dove Mine, Ngobevu, Tugela River, Zululand.
[Hatch Coll. '09. No. H. 20.]
110. **Quartz Leader.**
Loc: Scottish Lode, Golden Dove Mine, Ngobevu, Tugela River, Zululand.
[Hatch Coll. '09. No. H. 21.]
111. **Contorted Magnetite Schist ("Calico Rock.")**
Loc: Umbizwa River, near Itala Mountain, Zululand.
[Hatch Coll. '09. No. B. 258.]
112. **Contorted Magnetite Schist ("Calico Rock.")**
Loc: Umbizwa River, near Itala Mountain, Zululand.
[Hatch Coll. '09. No. B. 340.]
113. **Conglomerate overlying the Magnetite Schist.**
Loc: Umbizwa River, near Itala Mountain, Zululand.
[Hatch Coll. '09. No. B. 145.]
114. **Leached Out Iron Ore.**
Loc: Near Cooper's Store, Umhlatuzi River, Zululand.
[Hatch Coll. '09. No. B. 128.]

Schists of the Nkandhla Forest and Bobe Ridge.

115. **Knotted Schist (Nkandhla Forest Series.)**

Loc: On road from Nkandhla Magistracy to Nkandhla Forest, $\frac{1}{2}$ -mile above Spruit, near old Magistracy, Zululand. [Hatch Coll. '09. No. T.D. 154.]

116. **Green Schist (Nkandhla Forest Series.)**

Loc: $\frac{1}{2}$ -mile East of Spruit, near Mission Station, Nkandhla Magistracy, Zululand. [Hatch Coll. '09. No. P.D. 87.]

117. **Kyanite Schist (Nkandhla Forest Series.)**

Loc: Road Cutting, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. P.D. 61.]

118. **Kyanite Schist (Nkandhla Forest Series.)**

Loc: Road cutting, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 148.]

119. **Kyanite Crystal (from Kyanite Schist.)**

Loc: Road cutting, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 137.]

120. **Schist (Nkandhla Forest Series.)**

Loc: Bobe Ridge, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. P.D. 71.]

121. **Mica Schist (Nkandhla Forest Series.)**

Loc: Bobe Ridge, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 136.]

122. ***Mica Schist (Nkandhla Forest Series.)***

Loc: Bobe Ridge, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 146.]

123. ***Quartz Schist (Nkandhla Forest Series.)***

Loc: Bobe Ridge, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 177.]

124. ***Quartz Schist (Nkandhla Forest Series.)***

Loc: Bobe Ridge, Nkandhla Forest, Zululand.

[Hatch Coll. '09. No. T.D. 139.]

125. ***Quartz with Visible Gold.***

Loc: Nkozana Gold Mine, Nkandhla District, Zululand.

[Hatch Coll. '09. No. T.D. 144.]

Schists of the Tugela River Series.

126. ***Chloritic Grit (Tugela River Series.)***

Loc: Tugela River, South of Tugela Mine, Zululand.

[Hatch Coll. '09. No. P.D. 56.]

127. ***Chloritic Grit (Tugela River Series.)***

Loc: Tugela River, South of Tugela Mine, Zululand.

[Hatch Coll. '09. No. D. 350.]

128. ***Hornblende Schist (Tugela River Series.)***

Loc: Tugela River, South of Tugela Mine, Zululand.

[Hatch Coll. '09. No. P.D. 46.]

129. **Coarse Hornblende Schist.**
Loc: Tugela River, South of Tugela Mine, Zululand.
[Hatch Coll. '09. No. D. 242.]
130. **Felspathic Grit (Tugela River Series.)**
Loc: Tugela River, South of Tugela Mine, Zululand.
[Hatch Coll. '09. No. P.D. 57.]
131. **Felspathic Grit (Tugela River Series.)**
Loc: Tugela River, South of Tugela Mine, Zululand.
[Hatch Coll. '09. No. D. 351.]
132. **Felspathic Grit (Tugela River Series.)**
Loc: Tugela River, South of Tugela Mine, Zululand.
[Hatch Coll. '09. No. D. 373.]
133. **Felspathic Grit (Tugela River Series.)**
Loc: Tugela River, south of Tugela Mine, Zululand.
[Hatch Coll. '09. No. D. 217.]
134. **Hornblende Schist (Tugela River Series.)**
Loc: Phoenix Mine, Tugela River.
[Hatch Coll. '09. No. B. 274.]
135. **Hornblende Schist (Tugela River Series.)**
Loc: Mouth of Adit, Phoenix Mine, Tugela River.
[Hatch Coll. '09. No. P.D. 26.]
136. **Hornblende Schist (Tugela River Series.)**
Loc: Left bank of Tugela River, north of Phoenix Mine.
[Hatch Coll. '09. No. D. 349.]

137. **Hornblende Rock (Tugela River Series)**

Loc: Phoenix Mine, Tugela River.

[Hatch Coll. '09. No. P.D. 29.]

138. **Hornblende Rock (Tugela River Series.)**

Loc: Phoenix Mine, Tugela River.

[Hatch Coll. '09. No. P.D. 43.]

139. **White Quartz.**

Loc: Phoenix Mine, Tugela River.

[Hatch Coll. '09. No. P.D. 36.]

140. **Vein Quartz.**

Loc: Phoenix Mine, Tugela River.

[Hatch Coll. '09. No. P.D. 27.]

Mpapala Schists, with Aplite Dykes and Quartz Veins.

141. **Hornblende-Mica Schist (Mpapala Series.)**

Loc: Havilah, Shaft No. 1, Mpapala, Zululand.

[Hatch Coll. '09. No. D. 253.]

142. **Hornblende-Mica Schist (Mpapala Series.)**

Loc: Havilah, Shaft No. 1, Mpapala, Zululand.

[Hatch Coll. '09. No. D. 220.]

143. **Schist (Mpapala Series.)**

Loc: Cooper's Gold Claims, Mpapala, Zululand.

[Hatch Coll. '09. No. P.D. 37.]

144. **Hornblende Schist (Mpapala Series.)**
Loc : Metamorfa River, near Middleton's Battery, Rebellion
 Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. C. 6.]
145. **Hornblende Schist (Mpapala Series.)**
Loc : Metamorfa River, near Middleton's Battery, Rebellion
 Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. C. 4.]
146. **Ribbon Quartz.**
Loc : Rebellion Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. C. 12.]
147. **Ribbon Quartz.**
Loc : Rebellion Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. C. 11a.]
148. **Schistose Quartz.**
Loc : Rebellion Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. D. 291.]
149. **Schistose Quartz.**
Loc : Rebellion Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. D. 249.]
150. **Microgranite.**
Loc : Country Rock, Footwall of Rebellion Reef, Mpapala,
 Zululand.
 [Hatch Coll. '09. No. D. 237.]
151. **Microgranite.**
Loc : Rebellion Reef, Mpapala, Zululand.
 [Hatch Coll. '09. No. D. 222.]

Fort Yolland Schists with Aplite and Pegmatite
Veins.

152. **Hornblende Schist (Fort Yolland Series.)**
Loc: $\frac{1}{2}$ -mile down Nkomo, on South side of cutting on road
to Fort Yolland, Zululand.
[Hatch Coll. '09. No. T.D. 122.]
153. **Hornblende Schist (Fort Yolland Series.)**
Loc: Mvuzana Spruit, $1\frac{1}{2}$ miles above Fort Yolland,
Zululand.
[Hatch Coll. '09. No. T.D. 191.]
154. **Hornblende Schist (Fort Yolland Series.)**
Loc: Cutting 3 miles from top of Nkomo, on road to Fort
Yolland, Zululand.
[Hatch Coll. '09. No. D. 97.]
155. **Hornblende Schist (Fort Yolland Series.)**
Loc: $\frac{1}{2}$ -mile down Nkomo, on South side of cutting on road
to Fort Yolland, Zululand.
[Hatch Coll. '09. No. P.D. 78.]
156. **Hornblende Schist (Fort Yolland Series.)**
Loc: Mvuzana Spruit, $1\frac{1}{2}$ miles above Fort Yolland, Zulu-
land.
[Hatch Coll. '09. No. T.D. 126.]
157. **Aplitic Granite.**
Loc: Flanks of Nkomo, near head of Ulambo Stream,
Zululand.
[Hatch Coll. '09. No. T.D. 190.]
158. **Aplite.**
Loc: Mvuzana Spruit, $1\frac{1}{2}$ miles above Fort Yolland, Zulu-
land.
[Hatch Coll. '09. No. P.D. 84.]

159.

Aplite.

Loc: Mvuzana Spruit, 1½ miles above Fort Yolland, Zululand.

[Hatch Coll. '09. No. T.D. 189.]

Ore and Mineral Deposits.

160. **Hornblende Schist (Fort Yolland Series.)**

Loc: Hazelhurst's Claims, Ntunji River, near Melmoth, Zululand.

[Hatch Coll. '09. No. C. 25.]

161.

Pegmatite.

Loc: Hazelhurst's Claims, Ntunji River, near Melmoth, Zululand.

[Hatch Coll. '09. No. B. 321.]

162.

Pegmatite with Cassiterite.

Loc: Hazelhurst's Claims, Ntunji River, Zululand.

[Hatch Coll. '09. No. C. 30a.]

163.

Pegmatite.

Loc: Hazelhurst's Claims, Ntunji River, Zululand.

[Hatch Coll. '09. No. C. 33.]

164.

Pegmatite with Cassiterite.

Loc: Hazelhurst's Claims, Ntunji River, Zululand.

[Hatch Coll. '09. No. C. 29.]

165.

Saccharoidal Quartz.

Loc: Hazelhurst's Claims, Ntunji River, Zululand.

[Hatch Coll. '09. No. C. 27.]

166. **Pegmatite.**
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
Zululand.
[Hatch Coll. '09. No. B. 301.]
167. **Garnetiferous Pegmatite.**
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
Zululand.
[Hatch Coll. '09. No. B. 323.]
168. **Tourmaline-Pegmatite.**
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
Zululand.
[Hatch Coll. '09. No. C. 39.]
169. **Mica-Pegmatite.**
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
Zululand.
[Hatch Coll. '09. No. B. 209.]
170. **Mica.**
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
Zululand.
[Hatch Coll. '09. No. D. 212a.]
171. **Mica.**
Loc : Mica-Pegmatite Workings, near Melmoth, Zululand.
[Hatch Coll. '09. No. C. 19.]
172. **Pegmatite.**
Loc : Hulett's Claims, near Eshowe, Zululand.
[Hatch Coll. '09. No. C. 55.]
173. **Pegmatite.**
Loc : Hulett's Claims, near Eshowe, Zululand.
[Hatch Coll. '09. No. C. 61.]

174.

Mica.

Loc: Mica Mine. 3 miles N. of Fort Yolland Store, in fork between Mvuzuna River and a tributary of the same, Zululand. [Hatch Coll. '09. No. D. 93.]

175.

Mica-Pegmatite.

Loc: Mica Mine. 3 miles N. of Fort Yolland Store, in fork between Mvuzana River and a tributary of the same, Zululand. [Hatch Coll. '09. No. D. 250.]

176.

Mica.

Loc: Mica mine, 3 miles north of Fort Yolland store, in fork between Mvuzana River and a tributary of the same, Zululand. [Hatch Coll. '09. No. D. 240a.]

177.

Mica.

Loc: Mica mine, 3 miles north of Fort Yolland store, in fork between Mvuzana River and a tributary of the same, Zululand. [Hatch Coll. '09. No. D. 241.]

178.

Mica.

Loc: Mica mine, 3 miles north of Fort Yolland store, in fork between Mvuzana River and a tributary of the same, Zululand. [Hatch Coll. '09. No. D. 241.]

179.

Mica (in Pegmatite).

Loc: Mica mine, 3 miles north of Fort Yolland store, in fork between Mvuzana River and a tributary of the same, Zululand. [Hatch Coll. '09. No. P.D. 91.]

180.

Pegmatite.

Loc: Ungoye Range, 8 miles east of Eshowe, Zululand.

[Hatch Coll. '09. No. P.B. 19.]

181.

Pegmatite.

Loc: Ungoye Range, 8 miles east of Eshowe, Zululand.

[Hatch Coll. '09. No. P.B. 10.]

182. ***Mica (in Pegmatite.)***

Loc: Ungoye Range, 8 miles east of Eshowe, Zululand.

[Hatch Coll. '09. No. C. 82.]

183. ***Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. D. 329.]

184. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. C. 10a.]

185. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. D. 236.]

186. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. D. 293.]

187. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. C. 1.]

188. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. D. 232.]

189. ***Chrysotile in Serpentine.***

Loc: Sitelo asbestos mine, near Fort Yolland, Zululand.

[Hatch Coll. '09. No. D. 225.]

190. ***Chrysotile in Serpentine.***
Loc : Sitelo asbestos mine, near Fort Yolland, Zululand.
(Hatch Coll. '09. No. D. 224.1)
191. ***Chrysotile in Serpentine.***
Loc : Sitelo asbestos mine, near Fort Yolland, Zululand.
(Hatch Coll. '09. No. C. 9.1)
192. ***Chrysotile in Serpentine.***
Loc : Sitelo asbestos mine, near Fort Yolland, Zululand.
(Hatch Coll. '09. No. D. 229.1)
- Large Specimens at bottom of case.
193. ***Pegmatite with White Felspar & Green Mica.***
Loc : Hazelhurst's Claim, Ntunji River, near Melmoth,
 Zululand.
(Hatch Coll. '09. No. C. 32.1)
194. ***Pegmatite (with Mica.)***
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
 Zululand.
(Hatch Coll. '09. No. C. 38.1)
195. ***Pegmatite (with Mica.)***
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
 Zululand.
(Hatch Coll. '09. No. C. 35.1)
196. ***Pegmatite (with Mica.)***
Loc : Premier Tin Claims, Umfuli River, near Melmoth,
 Zululand.
(Hatch Coll. '09. No. B. 217.1)

197.

Pegmatite.*Loc*: Hulett's Claims, near Eshowe, Zululand.

IHatch Coll. '09. No. C. 62.1

Quartzites and Schists of the Swaziland System
in the Vryheid District (Barberton formation of
Molengraaff.)

198.

Schist.*Loc*: Near Bellevue, Vryheid District.

IHatch Coll. '09. No. D. 499.1

199.

Schist.*Loc*: No. 1 Iron Belt, Dwaalhoek, Vryheid District.

IHatch Coll. '09. No. D. 479.1

200.

Schist.*Loc*: No. 1 Iron Belt, Dwaalhoek, Vryheid District.

IHatch Coll. '09. No. D. 481.1

201.

Quartzite.*Loc*: Bellevue, Vryheid District.

IHatch Coll. '09. No. D. 490.1

202.

Quartzite.*Loc*: Bellevue, Vryheid District.

IHatch Coll. '09. No. D. 473.1

203.

Quartzite.*Loc*: Bellevue, Vryheid District.

IHatch Coll. '09. No. D. 492.1

204. **Quartzite.**
Loc: Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 491.]
205. **Quartzite.**
Loc: Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 498.]
206. **Quartzite.**
Loc: Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 478.]
207. **Quartzite.**
Loc: Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 485.]
- Ore Deposits: Iron and Manganese.
208. **Banded Jasper Ironstone ("Calico Rock.")**
Loc: No. 2 Belt, Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 447.]
209. **Banded and Contorted Jasper Ironstone
("Calico Rock.")**
Loc: No. 2 Belt, Bellevue, Vryheid District.
[Hatch Coll. '09. No. D. 446.]
210. **Banded Iron Slate.**
Loc: Breda, Vryheid District.
[Hatch Coll. '09. No. D. 413.]

211.

Jasper Ironstone.

Loc : Incline Shaft No. 2, boundary of Palmietfontein and Dipka, Vryheid District.

[Hatch Coll. '09. No. D. 458.]

212.

Jasper Breccia.

Loc : Incline Shaft No. 2, boundary of Palmietfontein and Dipka, Vryheid District.

[Hatch Coll. '09. No. D. 493.]

213.

Soft Haematite.

Loc : Incline Shaft No. 2, boundary of Palmietfontein and Dipka, Vryheid District.

[Hatch Coll. '09. No. D. 456.]

214.

Haematite.

Loc : No. 1 Iron Belt, Dwaalhoek, Vryheid District.

[Hatch Coll. '09. No. D. 462.]

215.

Haematite (above Jasper bed.)

Loc : 200ft. S. of Incline Shaft No. 2. Spruit on right bank of Manzana. Boundary of Palmietfontein and Dipka, Vryheid District.

[Hatch Coll. '09. No. D. 497.]

216.

Haematite.

Loc : Breda, Vryheid District.

[Hatch Coll. '09. No. D. 414.]

217.

Haematite.

Loc : Baviaan's Kranz, Vryheid District.

[Hatch Coll. '09. No. D. 405.]

218.

Manganese Ore (Psilomelane.)

Loc : Baviaan's Kranz, Vryheid District.

[Hatch Coll. '09. No. D. 402.]

219. **Manganese Ore (*Psilomelane*.)**

Loc : Goedgeloof, Vryheid District.

[Hatch Coll. '09. No. D. 404.1

220. **Manganese Ore (*Psilomelane*.)**

Loc : Baviaan's Kranz, Vryheid District.

[Hatch Coll. '09. No. D. 406.1

221. **Manganese Ore (*Psilomelane*.)**

Loc : Near homestead, below No. 1 Iron Belt, Bellevue, Vryheid District.

[Hatch Coll. '09. No. C. 40.1

222. **Manganese Ore (*Psilomelane*.)**

Loc : Near homestead, below No. 1 Iron Belt, Bellevue, Vryheid District.

[Hatch Coll. '09. No. C. 93.1

223. **Manganese Ore (*Psilomelane*.)**

Loc : Nyalissa, Vryheid District.

[Hatch Coll. '09. No. T.B. 356.1

224. **Manganese Ore (*Psilomelane*.)**

Loc : Nyalissa, Vryheid District.

[Hatch Coll. '09. No. T.B. 354.1

225. **Manganese Ore (*Psilomelane*.)**

Loc : Nyalissa, Vryheid District.

[Hatch Coll. '09. No. D. 425.1

226. **Manganese Ore (*Psilomelane*.)**

Loc : No. 1 Iron Belt, Twaalhoek, Vryheid District.

[Hatch Coll. '09. No. D. 476.1

227. **Manganese Ore (*Psilomelane*.)**

Loc : Below No. 4 Iron Belt, Betthany, Paulpietersburg District.

[Hatch Coll. '09. No. D. 467.1

Ore Deposits : Gold.

228. **Conglomerate.**

Loc : Dump, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. C 65.1

229. **Pebbles.**

Loc : Dump, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 545.1

230. **Banket (*Oxidised Ore*.)**

Loc : Stanhope Shaft, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 572.1

231. **Conglomerate (*Unoxidised Ore*.)**

Loc : Dump, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. C. 92.1

232. **Conglomerate.**

Loc : Stanhope Shaft, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 513.1

233. **Conglomerate.**

Loc : Stanhope Shaft, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 573.1

234. **Conglomerate (Unoxidised Ore.)***Loc* : Dump, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 113.]

235. **Conglomerate (from overlying Banket beds.)***Loc* : Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 536.]

236. **Conglomerate (from overlying Banket beds.)***Loc* : Denny Dalton, Mine, Vryheid District.

[Hatch Coll. '09. No. D. 590.]

237. **Jasper Beds.***Loc* : N.E. of Mill, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 575.]

238. **Jasper Beds.***Loc* : N.E. of Mill, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 460.]

239. **Jasper Beds.***Loc* : N.E. of Mill, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 589.]

240. **Schist (below Jasper.)***Loc* : N.E. of Mill, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 576.]

241. **Sandstone.***Loc* : Footwall of Reef, Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. D. 582.]

242.

Quartzite.*Loc* : Vryheid Series. Umfolosi Drift, Vryheid District.

[Hatch Coll. '09. No. D. 533.]

243.

Quartzite.*Loc* : Vryheid Series. Umfolosi Drift, Vryheid District.

[Hatch Coll. '09. No. D. 571.]

244.

Schist (underlying Quartzite.)*Loc* : Umfolosi Drift, Vryheid District.

[Hatch Coll. '09. No. D. 542.]

245.

Schist (underlying Quartzite.)*Loc* : Umfolosi Drift, Vryheid District.

[Hatch Coll. '09. No. D. 544.]

246.

Conglomerate.*Loc* : About 8 miles S.W. of Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 492.]

247.

Conglomerate.*Loc* : About 8 miles S.W. of Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 490.]

248.

Schist (Footwall of Conglomerate.)*Loc* : About 8 miles S.W. of Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 404.]

249.

Schist (Footwall of Conglomerate.)*Loc* : About 8 miles S.W. of Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 405.]

250.

Conglomerate.*Loc* : Cutting on Rondspring, Vryheid District.

[Hatch Coll. '09. No. D. 488.]

251. **Quartz Schist (Country Rock of Wonder Reef.)***Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 421.]

252.

Quartz (Outcrop of No. 2 Reef.)*Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 431.]

253.

Quartz.*Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 423.]

254.

Quartz.*Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 422.]

255.

Quartz.*Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 429.]

256.

Quartz.*Loc* : Wonder Mine, Wonderfontein, Vryheid District.

[Hatch Coll. '09. No. D. 424.]

Ore Deposits: Copper.

257. **Schistose Quartzite (Footwall of Lode.)**
Loc: North Drive No. 1 Shaft, Northern Copper, Vryheid District.
(Hatch Coll. '09. No. D. 483.)
258. **Chloritic Grit.**
Loc: Spruit, Northern Copper Mine, Vryheid District.
(Hatch Coll. '09. No. D. 502.)
259. **Chloritic Grit.**
Loc: Spruit, Northern Copper Mine, Vryheid District.
(Hatch Coll. '09. No. D. 506.)
260. **Quartz-Felspar Schist (with Pegmatite Vein.)**
Loc: Northern Copper Mine, Vryheid District.
(Hatch Coll. '09. No. D. 454.)
261. **Pegmatite (Vein in Quartz Schist.)**
Loc: Spruit near Strike's store, 23 miles from Vryheid
(Hatch Coll. '09. No. D. 452.)
262. **Schist (Wall of Quartz Vein.)**
Loc: No. 5 Shaft, Northern Copper Mine, Vryheid District.
(Hatch Coll. '09. No. D. 505.)
263. **"Gangue."**
Loc: No. 2 Shaft, Northern Copper Mine, Vryheid District.
(Hatch Coll. '90. No. D. 471.)
264. **"Gangue."**
Loc: No. 6 Shaft, Northern Copper Mine, Vryheid District.
(Hatch Coll. '09. No. D. 474.)

265. **Copper Ore (*Glance in Quartz.*)**
Loc : 50 ft. from collar of No. 1 Shaft, Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 475.]
266. **Copper Ore (*Copper Glance in part.*)**
Loc : Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 486.]
267. **Copper Ore (*Glance and Bornite.*)**
Loc : Bottom of No. 1 Shaft, Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 504.]
268. **Copper Ore (*Copper Glance.*)**
Loc : Dump, Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 455.]
269. **Copper Ore (*Glance in part.*)**
Loc : Dump, Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. B. 427.]
270. **Copper Ore (*Copper Glance in part.*)**
Loc : Dump, Northern Copper Mine, Vryheid District.
[Hatch Coll. '09. No. B. 414.]
271. **Garnetiferous Schist.**
Loc : Assegai Kraal, near Padley's Station.
[Hatch Coll. '09. No. D. 7.]
- Large Specimens at bottom of Case.
272. **Jasper Ironstone.**
Loc : Incline Shaft No. 2, boundary of Palmietfontein and Dipka, Vryheid District.
[Hatch Coll. '09. No. B. 464.]

273. ***Banded and Contorted Jasper Ironstone***
("Calico Rock.")

Loc: No. 2 Belt, Bellevue, Vryheid District.

[Hatch Coll. '09. No. B. 443.]

274. ***Banded and Contorted Jasper Ironstone.***
("Calico Rock.")

Loc: No. 2 Belt, Bellevue, Vryheid District.

[Hatch Coll. '09. No. D. 469.]

275. ***Conglomerate (Pyritic.)***

Loc: Denny Dalton Mine, Vryheid District.

[Hatch Coll. '09. No. P.D. 24.]

LIMESTONE IN METAMORPHIC SERIES.

276. ***Metamorphic Limestone.***

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 352.]

277. ***Metamorphic Limestone***

Loc: Amanzawayo River, Qudeni Zululand.

[Hatch Coll. '09. No. P.D. 40.]

278. ***Metamorphic Limestone.***

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 20.]

279. ***Metamorphic Limestone.***

Loc: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 343.]

280.

Metamorphic Limestone.*Loc*: Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 38.]

281.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 399.]

82.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 394.]

83.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 391.]

284.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 393.]

285.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 389.]

286.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 398.]

287.

Metamorphic Limestone.*Loc*: Nhlotshana Valley, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 385.]

288. ***Metamorphic Limestone.***
Loc: Nhlotshana Valley, Qudeni, Zululand.
[Hatch Coll. '09. No. D. 387.]
289. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 84.]
290. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 86.]
291. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 91.]
292. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. L. 87.]
293. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 88.]
294. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 80.]
295. ***Metamorphic Limestone.***
Loc: Marble Delta Company's Quarry, Port Shepstone.
[Hatch Coll. '09. No. D. 90.]

296. **Calcite Vein in Limestone.**

Loc: Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 74.]

297. **Calcite Vein in Limestone.**

Loc: Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 77.]

298. **Marble.**

Loc: Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 43.]

Ore Deposits: Graphite.

299. **Graphite.**

Loc: Shaft, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 51.]

300. **Graphite.**

Loc: Trench, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 46.]

301. **Graphite in Limestone.**

Loc: Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 78.]

302. **Graphite.**

Loc: Trench, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 33.]

303.

Graphite.*Loc* : Outerop, close to Shaft, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 45.]

304.

Graphite.*Loc* : Shaft, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 17.]

305.

Graphite.*Loc* : Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. D. 15.]

Large Specimens at bottom of case

306.

Metamorphic Limestone.*Loc* : Marble Delta Company's Quarry, Port Shepstone.

[Hatch Coll. '09. No. D. 39.]

307.

Graphite Vein.*Loc* : Trench, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. B. 13.]

308.

Graphite Vein.*Loc* : Trench, Ndongeni, Port Shepstone.

[Hatch Coll. '09. No. B. 18.]

GRANITES INTRUSIVE IN ROCKS OF THE
SWAZILAND SYSTEM.

309.

Granite Porphyry.

Loc : Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. B. 224.]

310.

Granite Porphyry.

Loc : Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. D. 376.]

311.

Granite Porphyry.

Loc : Amanzawayo River, Qudeni, Zululand.

[Hatch Coll. '09. No. P.D. 53.]

312.

Granite.

Loc : Top of Ntaba'ka'Mpice, South of Cooper's store and
7 miles from Empandhleni Magistracy, Zululand.

[Hatch Coll. '09. No. T.D. 123.]

313.

Granite (Foliated.)

Loc : $1\frac{1}{4}$ miles South of Cooper's store, near contact,
Umhlatuze River, Zululand.

[Hatch Coll. '09. No. T.D. 130.]

314.

Granite (Foliated.)

Loc : $1\frac{1}{4}$ miles South of Cooper's store, near contact,
Umhlatuze River, Zululand

[Hatch Coll. '09. No. T.D. 127.]

315.

Granite (Foliated.)

Loc : Ungoye Range, 8 miles East of Eshowe, Zululand.

[Hatch Coll. '09. No. P.E. 17.]

316. **Granite (Foliated.)**
Loc: Ungoye Range, 8 miles East of Eshowe, Zululand.
[Hatch Coll. '09. No. P.B. 13.]
317. **Schist.**
Loc: South contact of Granite, Ungoye Range, 8 miles East of Eshowe, Zululand.
[Hatch Coll. '09. No. P.B. 14.]
318. **Granite.**
Loc: Near Lello's store, Nyalissa, Vryheid District.
[Hatch Coll. '09. No. T.D. 375a.]
319. **Granite (Porphyritic.)**
Loc: Goedhoek farm, 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 31.]
320. **Granite (Porphyritic.)**
Loc: Goedhoek farm, 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 74.]
321. **Granite (less Porphyritic.)**
Loc: East of Porphyritic Granite, Goedhoek, 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 596.]
322. **Granite (less Porphyritic.)**
Loc: East of Porphyritic Granite, Goedhoek, 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 565.]
323. **Granite (less Porphyritic.)**
Loc: East of Porphyritic Granite, Goedhoek, 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 547.]

324. **Granite (less Porphyritic.)**
Loc: East of Porphyritic Granite, Goedhoek, 1 mile North
of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 112.]
325. **Granite.**
Loc: Intake weir, Subeni River, Vryheid District.
[Hatch Coll. '09. No. D. 541.]
326. **Granite.**
Loc: Intake weir, Subeni River, Vryheid District.
[Hatch Coll. '09. No. D. 522.]
327. **Granite.**
Loc: Intake weir, Subeni River, Vryheid District.
[Hatch Coll. '09. No. D. 538.1]
328. **Granite.**
Loc: Water furrow, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 578.]
329. **Granite.**
Loc: Intake weir, Subeni River, Vryheid District.
[Hatch Coll. '09. No. D. 569.]
330. **Granite.**
Loc: Intake weir, Subeni River, Vryheid District.
[Hatch Coll. '09. No. D. 592.1]
331. **Granite (Country Rock of Lode.)**
Loc: Magdalena Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 549.1]

332.

Granite.

Loc : Cross-cut on 1st level from No. 1 Shaft to West Main Lode, Vryheid District.

[Hatch Coll. '09. No. D. 566.]

333.

Granite (Aplitic.)

Loc : Crossing of Subeni River, on path from Manager's house to Subeni Mine, Vryheid District.

[Hatch Coll. '09. No. D. 595.]

334.

Aplite.

Loc : Between Porphyritic Granite and Schistose Dyke, Goedhoek farm, about 1 mile North of Subeni Mine, Vryheid District.

[Hatch Coll. '09. No. D. 520.]

335.

Aplite.

Loc : Between Porphyritic Granite and Schistose Dyke, Goedhoek farm, about 1 mile North of Subeni Mine, Vryheid District.

[Hatch Coll. '09. No. D. 597.]

336.

Aplite.

Loc : Between Porphyritic Granite and Schistose Dyke, Goedhoek farm, about 1 mile North of Subeni Mine, Vryheid District.

[Hatch Coll. '09. No. D. 534.]

337.

Granite (Decomposed.)

Loc : Shore at Scottsburg, South Coast.

[Hatch Coll. '09. No. D. 38.]

338.

Granite (Decomposed.)

Loc : Shore at Scottsburg, South Coast.

[Hatch Coll. '09. No. D. 40.]

339.

Granite.

Loc : Dyke in Marble, right bank, Umzimkulu River, Port Shepstone.

[Hatch Coll. '09. No. D. 9.]

340. **Granite (Foliated.)**
Loc : Road to Park store, $\frac{1}{2}$ -mile south of Sinclair's house,
 Port Shepstone
 [Hatch Coll. '09. No. D. 70.]
341. **Granite (Foliated.)**
Loc : Road to Park store, $\frac{1}{2}$ -mile south of Sinclair's house,
 Port Shepstone.
 [Hatch Coll. '09. No. D. 71.]
342. **Granite (Foliated.)**
Loc : Road to Park store, $\frac{1}{2}$ -mile south of Sinclair's house,
 Port Shepstone.
 [Hatch Coll. '09. No. D. 69.]
343. **Granite (Foliated.)**
Loc : Railway cutting near Braemar Station, Umzinto
 Branch Line.
 [Hatch Coll. '09. No. D. 58.]

Ore Deposits : Copper.

344. **Granite (with Chalcopyrite on joint surfaces)**
Loc : Shaft on south extension of lode, south of No. 3 Shaft,
 Subeni Mine, Vryheid District.
 [Hatch Coll. '09. No. C. 81.]
345. **Granite (with Chalcopyrite on joint surfaces)**
Loc : 40ft. shaft on south extension of lode, south of No. 3
 Shaft, Subeni Mine, Vryheid District.
 [Hatch Coll. '09. No. C. 100.]
346. **Porphyritic Dyke.**
Loc : Lowest part of No. 3 Shaft, Subeni Mine, Vryheid
 District.
 [Hatch Coll. '09. No. D. 526.]

347. **Porphyritic Dyke.**
Loc: Lowest part of No 3 Shaft, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 557.]
348. **Porphyritic Dyke.**
Loc: Face of new cross-cut adit, East of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 484.]
349. **Porphyritic Dyke.**
Loc: Margin of Schist Belt, on Goedhoek farm, about 1 mile North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 487.]
350. **Porphyritic Dyke.**
Loc: East margin of Schist Belt, excavation near East Main Lode, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 99.]
351. **Porphyritic Dyke (Sheared.)**
Loc: West side of Schist Belt, No. 3 level, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 79.]
352. **Schist (altered Dyke) with Chalcopyrite.**
Loc: No. 3 Shaft, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 512.]
353. **Schist (altered Dyke.)**
Loc: Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 523.]
- 354 **Schist (altered Dyke) with Chalcopyrite.**
Loc: Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 570.]

355. **Schist (altered Dyke.)**
Loc : Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 463.]
356. **Schist (altered Dyke.)**
Loc : Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 464.]
357. **Schist (altered Dyke.)**
Loc : Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 530.]
358. **Copper Ore (Chalcopyrite in Schistose Dyke.)**
Loc : Dump, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 84.]
359. **Copper Ore (Chalcopyrite.)**
Loc : No. 2 level, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 44.]
360. **Copper Ore (Chalcopyrite.)**
Loc : No. 2 Lateral, 3rd level, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. B. 326.]
361. **Copper Ore (Chalcopyrite and Bornite.)**
Loc : Outcrop of West Main Lode, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 80.]
362. **Copper Ore (Chalcopyrite and Bornite.)**
Loc : Outcrop of West Main Lode, Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. C. 49.]

363. **Quartz (from Buck Reef.)**
Loc: Beginning 21ft. from face of new cross-cut adit, east
of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 440.]
364. **Quartz (from Buck Reef.)**
Loc: Beginning 21ft. from face of new cross-cut adit, east
of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 528.]
365. **White Quartz (from Big Buck Reef.)**
Loc: North of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 591.]
366. **Dyke (with inclusions of Felspar & Granite.)**
Loc: Half-mile north of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 480.]
367. **Dyke (with inclusions of Felspar & Granite.)**
Loc: Half-mile north of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 537.]
368. **Dyke (with inclusions of Felspar & Granite.)**
Loc: Half-mile north of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 563.]
369. **Dyke (with inclusions of Felspar & Granite.)**
Loc: Half-mile north of Subeni Mine, Vryheid District.
[Hatch Coll. '09. No. D. 539.]
370. **Granite (Country Rock of Lode.)**
Loc: Magdalene Copper Mine, Vryheid District.
[Hatch Coll. '09. No. D. 548.]

371. **Granite (Country Rock of Lode.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. D. 531.]

372. **Granite (Country Rock of Lode.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. D. 534.]

373. **Granite (Country Rock of Lode.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. D. 532.]

374. **Copper Ore (Chalcopyrite.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. C. 47.]

375. **Copper Ore (Chalcopyrite.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. C. 46.]

376. **Copper Ore (Chalcopyrite.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. D. 43.]

377. **Copper Ore (Chalcopyrite.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. C. 52.]

378. **Copper Ore (Peacock Copper.)**

Loc: Magdalene Copper Mine, Vryheid District.

[Hatch Coll. '09. No. C. 64.]

379. **Granite (Gneissose.)**
Loc: Between big Dolerite Intrusion and Serpentine, near
Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 39.]
380. **Granite (Gneissose.)**
Loc: Between big Dolerite Intrusion and Serpentine, near
Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 35.]
381. **Granite (Gneissose.)**
Loc: Between big Dolerite Intrusion and Serpentine, near
Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. B. 428.]
382. **Aplite Dyke in Granite.**
Loc: 500 yards S.W. of Dania Mine, Nondweni, Vryheid
District.
[Hatch Coll. '09. No. B. 123.]
383. **Aplite Dyke in Granite.**
Loc: 500 yards S.W. of Dania Mine, Nondweni, Vryheid
District.
[Hatch C II. '09. No. B. 444.]
384. **Applite Dyke in Granite.**
Loc: 500 yards S.W. of Dania Mine, Nondweni, Vryheid
District.
[Hatch Coll. '09. No. B. 465.]
385. **Granite.**
Loc: Cross-cut, 156 ft. level, Dania Mine, Nondweni,
Vryheid District.
[Hatch Coll. '09. No. B. 244.]
386. **Granite.**
Loc: Hanging-wall, 200 ft. level, Dania Mine, Nondweni,
Vryheid District.
[Hatch Coll. '09. No. C. 671.]

387.

Granite.

Loc: Cross-cut, 146 ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 220.]

388.

Granite (with Pegmatite Vein.)

Loc: Cross-cut, 146 ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 329.]

389.

Mica Schist (Sheared Granite.)

Loc: Cross-cut, 146 ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 304.]

390.

Mica Schist (Sheared Granite.)

Loc: Cross-cut, 146 ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 65.]

391.

Mica Schist (Sheared Granite.)

Loc: Trench, west of Shaft, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. T.B. 358.]

392.

Quartzite (Sheared.)

Loc: Pioneer IV. Claim, Nondweni, Vryheid District

[Hatch Coll. '09. No. B. 500a.]

393.

Quartzite (Sheared.)

Loc: Schist Belt, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. P.B. 83.]

394.

Hornblende Schist.

Loc: S.E. boundary of St. Barbara Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 374.]

395.

Tremolite Schist.

Loc: St. Barbara Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 343.]

396.

Hornblende Rock.

Loc: Between Quartz Vein and the Nondweni River, south of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. T.B. 300.]

397.

Hornblende Rock.

Loc: Between Quartz Vein and the Nondweni River, south of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. T.B. 385.]

398.

Quartz (Big Buck Reef.)

Loc: Near Nondweni River, south of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. P.B. 30.1

399.

Serpentine

Loc: Surface, west of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 165.]

400.

Serpentine.

Loc: Surface, west of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 177.]

401.

Serpentine.

Loc: "Black Rocks," south of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. T.B. 381.]

402.

Serpentine.

Loc: "Black Rocks," south of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 430.]

403. **Serpentine.**
Loc: "Black Rocks," south of Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. T.B. 373.]
404. **Serpentine.**
Loc: Footwall of inclined shaft, at 170ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. B. 200.]
405. **Serpentine.**
Loc: Footwall, 200ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. D. 519.1]
406. **Serpentine (with Native Copper.)**
Loc: 100ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 59.]
407. **Copper Ore (Malachite.)**
Loc: 45ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 27.1]
408. **Copper Ore (Malachite.)**
Loc: 45ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 27.]
409. **Copper Ore (Melaconite with Chalcopyrite.)**
Loc: 75ft. level, Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. C. 70.1]
410. **Copper Ore (Native Copper and Blende.)**
Loc: 100ft. level Dania Mine, Nondweni, Vryheid District.
[Hatch Coll. '09. No. P.B. 29.]

411. **Copper Ore (Chalcopyrite, Zinc blende
 and Pyrrhotite.)**
Loc : 200ft. level, Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. C. 76.]
412. **Copper Ore (Chalcopyrite, Zinc blende
 and Pyrrhotite.)**
Loc : 200ft. level, Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. C. 53.]
413. **Copper Ore (Chalcopyrite, Zinc blende
 and Pyrrhotite.)**
Loc : 200ft. level, Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. D. 540.]
414. **Nodule (Blende, Chalcopyrite, Pyrrhotite
 and Quartz.)**
Loc : From treatment floor, Dania Mine, Nondweni, Vryheid
 District.
 [Hatch Coll. '09. No. C. 48.]
415. **Cement Copper.**
Loc : Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. B. 238.]
416. **Dyke.**
Loc : Surface, near east Beacon, St. Barbara Claim, near
 Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. B. 466.]
417. **Dyke.**
Loc : Surface, near east Beacon, St. Barbara Claim, near
 Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. T.B. 351.]
418. **Dolerite.**
Loc : Big Intrusion, from surface near Cuber's house, near
 Dania Mine, Nondweni, Vryheid District.
 [Hatch Coll. '09. No. B. 450.]

419.

Dolerite.*Loc* : Dyke, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 456.]

420.

Dolerite (with Granite Intrusions.)*Loc* : Big Whin Intrusion, near west Beacon of Fairstar No. 1 Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. C. 91.1]

421.

Dolerite (with Granite Intrusions.)*Loc* : Big Whin Intrusion, near west Beacon of Fairstar No. 1 Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. P.B. 28.1]

422.

Dolerite (with Granite Intrusions.)*Loc* : Big Whin Intrusion, near west Beacon of Fairstar No. 1 Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 203.]

423.

Dolerite (with Granite Intrusions.)*Loc* : Big Whin Intrusion, near west Beacon of Fairstar No. 1 Claim, near Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 228.1]

Ore Deposits : Gold.

424.

Granite (Gneissose.)*Loc* : Country Rock of Dumisa Quartz Vein, Dumisa.

[Hatch Coll. '09. No. D. 10.1]

425.

Granite (Gneissose.)*Loc* : Country Rock of Dumisa Quartz Vein, Dumisa.

[Hatch Coll. '09. No. D. 23.]

426. **Quartz.**

Loc : Dumisa Mine, Dumisa.

[Hatch Coll. '09. No. D. 48.]

Large Specimens at bottom of Case.

427. **Serpentine (with Native Copper.)**

Loc : 100ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 346.]

428. **Serpentine.**

Loc : West face of 75ft. level, Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 210.]

429. **Serpentine.**

Loc : Surface, west of Dania Mine, Nondweni, Vryheid District.

[Hatch Coll. '09. No. B. 218.]

WATERBERG SANDSTONE.430. **Conglomerate (Waterberg Sandstone.)**

Loc : Manyani Valley, near Ntingwe, Zululand.

[Hatch Coll. '09. No. D. 258.]

431. **Conglomerate (Waterberg Sandstone.)**

Loc : Manyani Valley, near Ntingwe, Zululand.

[Hatch Coll, '09. No. D. 272.]

432. **Pebbles from Conglomerate (Waterberg Sandstone.)**

Loc : Manyani Valley, near Ntingwe, Zululand.

[Hatch Coll. '09. No. B.282.]

433. **Conglomerate (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 207.]
434. **Conglomerate (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 319.]
435. **Conglomerate (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 305.]
436. **Conglomerate (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 286.]
437. **Conglomerate and Sandstone (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 206.]
438. **Sandstone (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 260.]
439. **Matrix of Conglomerate (Waterberg Sandstone.)**
Loc : Manyani Valley, near Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 271.]
440. **Conglomerate (Waterberg Sandstone.)**
Loc : Left bank of Umhlatuze River, near Cooper's store, Zululand.
[Hatch Coll. '09. No. B. 187.]

441. **Sandstone (Waterberg Sandstone.)**
Loc : Quarter of a mile down Nkomo River, Fort Yolland.
[Hatch Coll. '09. No. T.D. 195.]
442. **Conglomerate (Waterberg Sandstone.)**
Loc : Mquemi River, 3 miles from Empandhleni Magistracy,
Zululand.
[Hatch Coll. '09. No. P.D. 74.]
443. **Conglomerate (Waterberg Sandstone.)**
Loc : Mquemi River, 3 miles from Empandhleni Magistracy,
Zululand.
[Hatch Coll. '09. No. P.D. 69.]
444. **Quartzite.**
Loc : No. 2 Main Incline, Central Insuzi, Insuzi Valley,
Zululand.
[Hatch Coll. '09. No. D. 257.]
445. **Sandstone (Waterberg Sandstone.)**
Loc : Quarry, Alexandra Junction, South Coast.
[Hatch Coll. '09. No. D. 55.]
446. **Sandstone (Waterberg Sandstone.)**
Loc : Quarry, Alexandra Junction South Coast.
[Hatch Coll. '09. No. D. 56.]
447. **Sandstone (Waterberg Sandstone.)**
Loc : Shore at Alexandra Junction, South Coast.
[Hatch Coll. '09. No. B. 17.]

KARROO SYSTEM.

Dwyka Conglomerate.

448. ***Dwyka Conglomerate.***

Loc: Quarry at Point, Port Shepstone.

[Hatch Coll. '09. No. D. 63.]

449. ***Dwyka Conglomerate.***

Loc: Quarry at Point, Port Shepstone.

[Hatch Coll. '09. No. D. 24.]

450. ***Dwyka Conglomerate.***

Loc: Quarry at Point, Port Shepstone.

[Hatch Coll. '09. No. D. 52.]

451. ***Dwyka Conglomerate.***

Loc: Golden Dove Kopje, Tugela River, Zululand.

[Hatch Coll. '09. No. D. 194.]

452. ***Dwyka Conglomerate.***

Loc: Mlambomunye Valley, near Ntingwe, Zululand.

[Hatch Coll. '09. No. P.D. 15.]

453. ***Dwyka Conglomerate.***

Loc: Big Itala, Zululand.

[Hatch Coll. '09. No. D. 336.]

454. ***Fine Sandstone (Dwyka Conglomerate.)***

Loc: Big Itala, Zululand.

[Hatch Coll. '09. No. D. 285.]

455. ***Fine Sandstone (Dwyka Conglomerate.)***

Loc: Little Itala, Zululand.

[Hatch Coll. '09. No. D. 335.]

Ecca Shales and Phosphates.

456. ***Shale (Ecca Shales.)***

Loc: Road from Mfongosi to Ntingwe, Zululand.

[Hatch Coll. '09. No. D. 267.]

457. ***Shale (Ecca Shales.)***

Loc: Quarry, end of tramway, Howick Road, Maritzburg.

[Hatch Coll. '09. No. H. 16.]

458. ***Phosphatic Bed ("Reef.")***

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. D. 59.]

459. ***Phosphatic Bed ("Reef.")***

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. D. 66.]

460. ***Phosphatic Nodule.***

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. B. 37.]

461. ***Nodule in Iron Shale.***

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. H. 9.]

462. **Phosphatic Nodule (portion of interior.)**

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. D. 19.]

463. **Ferruginous shell to Nodule.**

Loc: Baviaan's Krantz, Weenen.

[Hatch Coll. '09. No. D. 54.]

464. **Phosphatic Nodule with Ferruginous Shell.**

Loc: Kaffir's Kraal, Weenen.

[Hatch Coll. '09. No. D. 21.]

465. **Phosphatic Nodule.**

Loc: Kaffir's Kraal, Weenen.

[Hatch Coll. '09. No. B. 83.]

466. **Phosphate Nodule.**

Loc: Kaffir's Kraal, Weenen.

[Hatch Coll. '09. No. D. 22.]

467. **Nodular Phosphatic Shale.**

Loc: Poitenea's Spruit, 11 miles west of Ladysmith.

[Hatch Coll. '09. No. B. 359.]

468. **Nodule in Shale.**

Loc: Poitenea's Spruit, 11 miles west of Ladysmith.

[Hatch Coll. '09. No. D. 137.]

469. **Dolerite.**

Loc: Dyke in spruit running into Poitenea's Spruit, 11 miles west of Ladysmith

[Hatch Coll. '09. No. D. 139.]

470. **Shale. Altered in contact with Dyke.**

Loc: Poitenea's Spruit, 11 miles west of Ladysmith.

[Hatch Coll. '09. No. B. 358.]

471. **Phosphatic Shale.**

Loc: Intombi Camp, 3 miles from Ladysmith, on west side of main line to Maritzburg.

[Hatch Coll. '09. No. D. 189.]

472. **Fossil Fish Scales and Bones in Phosphatic Nodules.**

Loc: Intombi Camp, 3 miles from Ladysmith, on west side of main line to Maritzburg.

[Hatch Coll. '09. No. B. 394.]

473. **Fossil Wood.**

Loc: Intombi Camp, 3 miles from Ladysmith, on west side of main line to Maritzburg.

[Hatch Coll. '09. No. B. 374.]

474. **Phosphatic Nodule.**

Loc: Top of Ecca series, Keerom, Byrne.

[Hatch Coll. '09. No. H. 11.]

Ecca Sandstones.

475. **Felspathic Sandstone (Ecca Sandstone.)**

Loc: Quarry, Town Hill, Maritzburg.

[Hatch Coll. '09. No. H. 15.]

476. **Sandstone (Ecca Sandstone.)**

Loc: Mason's Quarry, Town Bush Valley, Maritzburg.

[Hatch Coll. '09. No. D. 100.]

477. **Sandstone (Ecca Sandstone.)**
Loc: Mason's Quarry, Town Bush Valley, Maritzburg.
[Hatch Coll. '09. No. D. 95.]
478. **Sandstone (Ecca Sandstone.)**
Loc: Sweetwaters, near Maritzburg.
[Hatch Coll. '09. No. H. 14.]
479. **Sandy Shale.**
Loc: Natal-Cape Line, Gezubuso.
[Hatch Coll. '09. No. H. 13.]
480. **Sandstone (Ecca Sandstone.)**
Loc: Quarries at Greytown (used for building Town Hall,
Durban.)
[Hatch Coll. '09. No. D. 1.]
481. **Dolerite.**
Loc: Marja, portion of Doornkloof, 10 miles S.E. of Lady-
smith.
[Hatch Coll. '09. No. D. 132.]
482. **Sandstone (Ecca Sandstone.)**
Loc: Falls, Wasinija Spruit, remainder of Doornkloof, 10
miles S.E. of Ladysmith.
[Hatch Coll. '09. No. B. 361.]
483. **Sandstone (Ecca Sandstone.)**
Loc: Van Reenen's Pass. From a bed 10ft. thick. Good
building stone.
[Hatch Coll. '09. No. B. 354.]
484. **Sandstone (Ecca Sandstone.)**
Loc: Quarry, Nyazana Flats, near Gingindhlovu, Zululand.
[Hatch Coll. '09. No. C. 95.]

492.

Breccia.*Loc* : Maria, Doornkloof, 10 miles S.E. of Ladysmith.

[Hatch Coll. '09. No. D. 180.]

493.

Graphitic Shale.*Loc* : Doornkloof, Ladysmith.

[Hatch Coll. '09. No. P.A. 20.]

Ore Deposits : Iron.

494.

Micaceous Sandstone.*Loc* : Footwall of Iron Ore, Coal Measure Series, Prestwick.

[Hatch Coll. '09. No. B. 381.]

495.

Iron Ore (Haematite.)*Loc* : North's Cutting, Prestwick Iron Ore.

[Hatch Coll. '09. No. D. 154.]

496.

Iron Ore (Magnetic Haematite.)*Loc* : North's Cutting, Prestwick Iron Ore.

[Hatch Coll. '09. No. B. 384.]

497.

Iron Ore (Haematite.)*Loc* : North's Cutting, Prestwick Iron Ore.

[Hatch Coll. '09. No. B. 385.]

498.

Iron Ore (Magnetite and Haematite.)*Loc* : 1 mile east of Railway, near De Jager's Drift Station.

[Hatch Coll. '09. No. B. 379.]

499. **Iron Ore (Magnetite and Haematite.)**
Loc : 1 mile east of Railway, near De Jager's Drift Station.
 [Hatch Coll. '09. No. B. 379.]
500. **Iron Ore (Magnetite and Haematite.)**
Loc : 1 mile east of Railway, near De Jager's Drift Station.
 [Hatch Coll. '09. No. D. 153.]
501. **Iron Ore (Magnetite and Haematite.)**
Loc : 1 mile east of Railway, near De Jager's Drift Station.
 [Hatch Coll. '09. No. B. 378.]
502. **Iron Ore (Magnetite and Haematite.)**
Loc : 1 mile east of Railway, near De Jager's Drift Station.
 [Hatch Coll. '90. No. D. 151.]
503. **Fossiliferous Iron Band.**
Loc : De Jager's Drift, Utrecht District.
 [Hatch Coll. '09. No. D. 465.]
504. **Iron Ore (Haematite.)**
Loc : Slatter's, Mount Kelly, $\frac{1}{2}$ -mile S.E. of summit, Greytown.
 [Hatch Coll. '09. No. D. 82.]

Dolerite Sills.

505. **Dolerite (with Calcite Stringers.)**
Loc : Chase Valley, Pietermaritzburg.
 [Hatch Coll. '09. No. C. 7.]

506. ***Dolerite Sill.***
Loc: Chase Valley, Pietermaritzburg.
[Hatch Coll. '09. No. D. 338.]
507. ***Dyke (in Marble.)***
Loc: Tramway, Marble Delta Company, Port Shepstone.
[Hatch Coll. '09. No. B. 19.]
508. ***Dolerite.***
Loc: On road from Greytown to Inadi.
[Hatch Coll. '09. No. D. 129.]
509. ***Dolerite.***
Loc: Gypsum workings, 1 mile south of Ngobevu store,
Tugela River.
[Hatch Coll. '09. No. D. 192.]
510. ***Dolerite.***
Loc: Gypsum workings, 1 mile south of Ngobevu store,
Tugela River.
[Hatch Coll. '09. No. D. 140.]
511. ***Dolerite (Sill in Eccca Shales.)***
Loc: Road from Mfongosi to Ntingwe, Zululand.
[Hatch Coll. '09. No. D. 465.]
512. ***Dolerite (Sill in Eccca Sandstone.)***
Loc: Umsinga Mountain.
[Hatch Coll. '09. No. D. 107.]

Gypsum.

513.

Gypsum.

Loc: Tugela River, near Ngobevu store, 20 miles north of Greytown.

[Hatch Coll. '09. No. B. 60.]

514.

Gypsum.

Loc: Tugela River, near Ngobevu store, 20 miles north of Greytown.

[Hatch Coll. '09. No. B. 353.]

515.

Gypsum.

Loc: Tugela River, near Ngobevu store, 20 miles north of Greytown.

[Hatch Coll. '09. No. B. 88.]

Large Specimens at bottom of case.

516.

Dwyka Conglomerate.

Loc: Camperdown Road, near Maritzburg.

[Hatch Coll. '09. No. H. 8.]

517.

Wood Phosphate.

Loc: Town Lands, Weenen.

[Hatch Coll. '09. No. H. 12.]

518.

Phosphatic Nodule.

Loc: Portion of Kaffir's kraal, Weenen.

[Hatch Coll. '09. No. H. 10.]

519. **Phosphatic Nodule.**

Loc: Kaffir's kraal, Weenen.

[Hatch Coll. '09. No. B. 72.]

520. **Fossil fish scales and bones in Phosphatic Nodules.**

Loc: Intombi Camp, 3 miles from Ladysmith, on west side of main line to Maritzburg. [Hatch Coll. '09. No. B. 372.]

521. **Graphite.**

Loc: Seam B., Falls, Wasinija Spruit, remainder of Doornkloof, 10 miles S.E. of Ladysmith.

[Hatch Coll. '09. No. B. 357.]

SURFACE DEPOSITS.522. **Surface Limestone.**

Loc: Schiefnek, 14 miles S.E. of Waschbank Station.

[Hatch Coll. '09. No. D. 197.]

523. **Surface Limestone.**

Loc: Schiefnek, 14 miles S.E. of Waschbank Station.

[Hatch Coll. '09. No. D. 191.]

524. **Surface Limestone.**

Loc: Schiefnek, 14 miles S.E. of Waschbank Station.

[Hatch Coll. '09. No. D. 196.]

525. **Surface Limestone.**

Loc: Goedkeus, 15 miles S.E. of Waschbank Station.

[Hatch Coll. '09. No. D. 16.]

526. **Surface Limestone overlying Marble.**
Loc: Marble Delta Company's Quarry, Umzimkulu River,
Port Shepstone.
[Hatch Coll. '09. No. D. 81.]
527. **Surface Limestone.**
Loc: Baviaan's Krantz, Weenen.
[Hatch Coll. '09. No. D. 67.]
528. **Limestone.**
Loc: Brakfontein, near De Jager's Drift Station, Utrecht
District.
[Hatch Coll. '09. No. A. 132.]
529. **Limestone.**
Loc: Brakfontein, near De Jager's Drift Station, Utrecht
District.
[Hatch Coll. '09. No. B. 408.]
530. **Kaolin.**
Loc: Shaft, Padley's Station, near Botha's Hill.
[Hatch Coll. '09. No. B. 29.]
531. **Laterite (Surface Ironstone Breccia.)**
Loc: Gasset's Gap, Umhlatuze River, Zululand.
[Hatch Coll. '09. No. D. 221.]

Large Specimen at bottom of case.

532. **Surface Limestone.**
Loc: Kaffir's kraal, Weenen.
[Hatch Coll. '09. No. B. 59.]

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