

MISCELLANEOUS PUBLICATION #16

"Chemical Analyses Precambrian Rocks  
of Missouri"

Compiled by: William C. Hayes

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SUBJECT: PRECAMBRIAN

CHEMICAL ANALYSES  
PRECAMBRIAN ROCKS OF MISSOURI

Compiled by  
William C. Hayes



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June 1959

STATE OF MISSOURI  
Department of Business and Administration  
Division of  
GEOLOGICAL SURVEY AND WATER RESOURCES  
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1. Porphyry: 6 mi. E. of Ironton, Iron County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 181, (Melville), 1894.
2. Igneous rock: Tolman No. 25, Anal. No. 1618, MGS Laboratory, 7-28-32.
3. Porphyry: Iron Mountain, St. Francois County, Missouri, MGS Field Notebook 594, p. 5, (Tass) (H. W. Mundt), MGS Laboratory, June, 1924.
4. Porphyry: Road cut south of Stouts Creek between Ironton and Arcadia, Iron County, Missouri, MGS Field Notebook 757, p. 28, (R. T. Rolufs), MGS Laboratory, 11-30-32.
5. Latite: Northern quarry, Lon Sanders Canyon north of Piedmont in SW $\frac{1}{4}$  SE $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 14, T. 29 N., R. 3 E., Wayne County, Missouri (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
6. Latite: Near Piedmont, Wayne County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 181, (St. Louis Sampling and Testing Works), 1895.
7. Latite: Mudlick Mountain, Sam A. Baker State Park, NW $\frac{1}{4}$  sec. 28, T. 30 N., R. 5 E., Wayne County, Missouri, (R. T. Rolufs), MGS Laboratory, 1933.
8. Rhyolite: East side of Brown Mountain, south of Lake Killarney, east edge SE $\frac{1}{4}$  SE $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 12, T. 33 N., R. 4 E., Iron County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
9. Rhyolite: From west side St. Francois River, NW $\frac{1}{4}$  NW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 10, T. 32 N., R. 5 E., Madison County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
10. Rhyolite: From north end of Royal Gorge on west side of highway 21 about the center of the east side of SE $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 14, T. 33 N., R. 3 E., Iron County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
11. Rhyolite: From southeast of West Knob of Stegall Mountain, NW $\frac{1}{4}$  SE $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 19, T. 28 N., R. 3 W., Carter County, Missouri, (E. Chadbourn), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, November, 1948.
12. Rhyolite: Near crest of ridge extending SE from the top of Clark Mountain, SW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 18, T. 29 N., R. 4 E., Wayne County, Missouri (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
13. Rhyolite: Northeast of bridge across Stouts Creek at the west end of Stouts Creek Shut-in on extreme W side of sec. 2, extreme SW corner W $\frac{1}{2}$  lot 3 W., T. 33 N., R. 4 E., Iron County, Missouri, (E. Chadbourn), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, November, 1948.

14. Rhyolite: South of fork in road in front of white frame house in the center of the  $W\frac{1}{2}$   $SW\frac{1}{4}$   $NE\frac{1}{4}$  sec. 17, T. 34 N., R. 6 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
15. Rhyolite: Near Skrainka quarry  $E\frac{1}{2}$  lot 5 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. B. Ellestad), 1931.
16. Rhyolite: Lake Avalon damsite,  $N\frac{1}{2}$   $SW\frac{1}{4}$   $NE\frac{1}{4}$  sec. 22, T. 35 N., R. 4 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, 1947.
17. Rhyolite: Probably from knob on south side of Stouts Creek near east sec. line sec. 6, T. 33 N., R. 5 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 182, (Melville), 1895.
18. Rhyolite: Southwest of granite contact, probably  $SW\frac{1}{4}$   $SW\frac{1}{4}$  sec. 22, T. 34 N., R. 3 E., Iron County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
19. Rhyolite: Knob south of Stouts Creek, sec. 6, T. 33 N., R. 5 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 213, (Melville), 1895.
20. Rhyolite, southern part of eastern contact, Graniteville, southeast of Sheahan quarry, probably  $NE\frac{1}{4}$   $SW\frac{1}{4}$  sec. 11, T. 34 N., R. 3 E., Iron County, Missouri, (R. T. Rolufs) MGS Laboratory, 1931.
21. Rhyolite: At French Mills, probably  $NW\frac{1}{4}$  sec. 15, T. 33 N., R. 5 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 181, (Melville), 1895.
22. Rhyolite: Iron Mountain, sec. 31, T. 35 N., R. 4 E., St. Francois County, Missouri, (R. B. Ellestad), University of Minnesota, Minneapolis, Minnesota, 1931.
23. Rhyolite: NW flank of Lee Mountain, outcrop on south side of East Fork of Black River,  $SW\frac{1}{4}$   $SE\frac{1}{4}$   $SW\frac{1}{4}$  sec. 26, T. 33 N., R. 2 E., Reynolds County, Missouri, (E. Chadbourn), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, 1948.
24. Rhyolite: Cedar Creek bridge on Highway M,  $NE\frac{1}{4}$  sec. 29, T. 36 N., R. 3 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 48, (Al Rice), 1956.
25. Rhyolite: Along Highway 32, 1 mi. E. of Caledonia,  $NE\frac{1}{4}$  sec. 7, T. 35 N., R. 3 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 54, (Al Rice), 1956.
26. Rhyolite: Highway C,  $1\frac{1}{2}$  mi. west of Highway 21, sec. 3, T. 35 N., R. 2 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 57, (Al Rice), 1956.

27. Rhyolite: St. Joe Mine No. 8, sec. 13?, T. 36 N., R. 3 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 61 (Al Rice), 1956.
28. Trachyte: SW flank of Brown Mountain, center NW $\frac{1}{4}$  NW $\frac{1}{4}$  NW $\frac{1}{4}$  sec. 9, T. 34 N., R. 4 E., St. Francois County, Missouri, (James V. Kerr, and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, November, 1947.
29. Trachyte: Small quarry SW $\frac{1}{4}$  SE $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 14, T. 31 N., R. 3 E., in the town of Annapolis, Iron County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, 1947.
30. Trachyte: Indian Creek Mine of St. Joseph Lead Company, sec. 3, T. 38 N., R. 1 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 63, (Al Rice), 1956.
31. Felsite: Quarry about 1800 ft. NW of fire tower on Knoblick Mountain, SW $\frac{1}{4}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 8, T. 34 N., R. 6 E., St. Francois County, Missouri, (R. T. Rolufs), MGS Laboratory, 1930.
32. Felsite: Near hill crest E<sub>C</sub> NE $\frac{1}{4}$  SE $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 22, T. 32 N., R. 5 E., Madison County, Missouri, (Doris Thaemlitz), University of Minnesota, Minneapolis, Minnesota, 1958.
33. Felsite: Southeast of Iron Mountain Lake, NE $\frac{1}{4}$  SW $\frac{1}{4}$  SW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 4, T. 34 N., R. 4 E., St. Francois County, Missouri, (Doris Thaemlitz), University of Minnesota, Minneapolis, Minnesota, 1958.
34. Felsite: From Ozark Ore Company DH 3790 between Big Cut and Hayes Cut, Iron Mountain, St. Francois County, Missouri; sample composite of core from 950' and 965', (Doris Thaemlitz), University of Minnesota, Minneapolis, Minnesota, 1958.
35. Felsite: Composite analysis of chip samples of felsite from Hayes Cut, Iron Mountain, St. Francois County, Missouri, (Doris Thaemlitz) University of Minnesota, Minneapolis, Minnesota, 1958.
36. Andesite: Top of hill near Blue School in SW $\frac{1}{4}$  NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 14, T. 32 N., R. 4 E., Iron County, Missouri, (Doris Thaemlitz), University of Minnesota, Minneapolis, Minnesota, 1958.
37. Andesite: North of Potosi-Ste. Genevieve road, N $\frac{1}{2}$  SE $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 9, T. 37 N., R. 6 E., Ste. Genevieve County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
38. Granite: Graniteville, Iron County, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 140, (Melville), 1895.
39. Granite: 2 mi. W. of Silvermine, Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 140, (St. Louis Sampling and Testing Works), 1895.
40. Granite: Graniteville, Iron County, Missouri, Field Notebook 772, p. 168, (R. T. Rolufs), MGS Laboratory, 1-8-40.

41. Granite: NW $\frac{1}{2}$  SE $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 22, T. 34 N., R. 3 E., Iron County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
42. Granite: Creek Nation Road, south side of road at east end of shut-in just west of the east section line sec. 31, T. 33 N., R. 6 E., Madison County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
43. Granite: Quarry SW $\frac{1}{2}$  NE $\frac{1}{2}$  sec. 10, T. 27 N., R. 4 E., Wayne County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
44. Granite: Sheahan quarry, SW $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 11, T. 34 N., R. 3 E., Iron County, Missouri, Carl Tolman and S. S. Goldich, The Granite, pegmatite, and replacement veins in the Sheahan quarry, Graniteville, Missouri, Am. Min., vol. 20, pp. 229-239, 1935.
45. Granite: Scotts quarry, N. central part of S $\frac{1}{2}$  NE $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 36, T. 35 N., R. 5 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
46. Granite: Miller and Sykes quarry, SE $\frac{1}{2}$  SW $\frac{1}{2}$  NE $\frac{1}{2}$  sec. 36, T. 35 N., R. 4 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
47. Granite: Sheahan quarry, from 3d bench down, in SE part of new quarry (east end) SE cor. NW $\frac{1}{2}$  SW $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 11, T. 34 N., R. 3 E., Iron County, Missouri, (E. Chadbourn), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, 1948.
48. Granite: SE cor. NE $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 25, T. 33 N., R. 7 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
49. Granite, south slope of Buck Mountain, probably northern part of sec. 5, T. 33 N., R. 6 E., Madison County, Missouri, (D. L. Miller), Washington University, St. Louis, Missouri, 1933.
50. Granite: Dresner quarry (?) SW flank of Holliday Mountain, NW $\frac{1}{2}$  E $\frac{1}{2}$  lot 3 E., sec. 5, T. 33 N., R. 6 E., Madison County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
51. Granite: Quarry four miles north of Bismark, SW corner NW $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 20, T. 36 N., R. 4 E., St. Francois County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
52. Granite: Eastern quarry of Missouri Granite Works on Klondike Hill, SW $\frac{1}{2}$  NW $\frac{1}{2}$  NW $\frac{1}{2}$  sec. 2, T. 34 N., R. 5 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
53. Granite: Milne and Gordon quarry, at Syenite, center N $\frac{1}{2}$  NW $\frac{1}{2}$  SW $\frac{1}{2}$  sec. 5, T. 34 N., R. 6 E., St. Francois County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
54. Granite: Quarry on east side of Current River south of Van Buren in lot 7 E., sec. 29, T. 27 N., R. 1 E., Carter County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.



55. Granite:  $\frac{1}{2}$  mile west of Syenite, NW corner NE $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 5, T. 35 N., R. 6 E., St. Francois County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
56. Granite: One mile north of Lodi on U. S. Highway 61, SE corner NW $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 24, T. 30 N., R. 5 E., Wayne County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
57. Granite: Quarry 50 yards south of Highway 32, SE corner SW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 7, T. 36 N., R. 7 E., Ste. Genevieve County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
58. Granite: Knob east of Slabtown, W $\frac{1}{2}$  lot 1 W., sec. 6, T. 33 N., R. 7 E., Madison County, Missouri, (S. S. Coldich), Washington University, St. Louis, Missouri, 1933.
59. Granite: Northeast side of Highway H, NE $\frac{1}{4}$  E $\frac{1}{2}$  lot 7 E., sec. 2, T. 33 N., R. 6 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1932.
60. Granite:  $\frac{1}{2}$  mile west of Mine La Motte village, W $\frac{1}{2}$  NE $\frac{1}{4}$  sec. 31, T. 34 N., R. 7 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
61. Granite: Knob south of Stouts Creek near east side of sec. 6, T. 33 N., R. 5 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 140, (Melville), 1895.
62. Granite:  $\frac{1}{4}$  mile SW of Catherine shaft in W $\frac{1}{2}$  lot 4 E., sec. 2, T. 33 N., R. 6 E., Madison County, Missouri, (D. L. Miller, Jr.), Washington University, St. Louis, Missouri, 1934.
63. Granite: Small quarry NE corner sec. 15, T. 35 N., R. 4 E., about 0.1 mi. W. of center on N. line of section, St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
64. Granite: Small knob south of Stouts Creek near east side of sec. 6, T. 33 N., R. 5 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 140, (Melville), 1895.
65. Granite: Outcrop on west side of St. Francois River just west of bridge NE corner NW $\frac{1}{4}$  NE $\frac{1}{4}$  NE $\frac{1}{4}$  sec. 13, T. 33 N., R. 5 E., Madison County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
66. Granite: Probably from small quarry SW $\frac{1}{4}$  NW $\frac{1}{4}$  NE $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 5, T. 34 N., R. 6 E., St. Francois County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
67. Granite: Quarry NE $\frac{1}{4}$  NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 4, T. 34 N., R. 6 E., St. Francois County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September 1947.
68. Granite: At contact with Silvermine granite about  $\frac{1}{2}$  mile S. of Highway 70 on the St. Francois River about the center W $\frac{1}{2}$  lot 5 E., sec. 4, T. 33 N., R. 5 E., Madison County, Missouri, (D. L. Miller, Jr.), Washington University, St. Louis, Missouri, 1933.

69. Granite porphyry: North end of Wing Lake dam, center  $W\frac{1}{2}$   $NE\frac{1}{4}$   $SW\frac{1}{4}$  sec. 14, T. 35 N., R. 3 E., Iron County, Missouri, (James V. Kerr and Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, September, 1947.
70. Granite porphyry: From 20 foot monolithic block on NW bank of East Fork of Black River,  $NE\frac{1}{4}$   $E\frac{1}{2}$  lot 2 E., sec. 4, T. 33 N., R. 2 E., Reynolds County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
71. Granite: From Hayden Creek mine, St. Joe Lead Company, secs. 7 and 8, T. 36 N., R. 4 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 15, (Al Rice), 1956.
72. Granite: Secs. 19, 20, 29, and 30, T. 35 N., R. 4 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 20, (Al Rice), 1956.
73. Granite: From Czar Knob, secs. 9 and 15, T. 55 N., R. 2 W., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 27, (Al Rice), 1956.
74. Basalt: Merrill Knob on Rock Creek, under sandstone (La Motte) bluff,  $NW\frac{1}{4}$   $NE\frac{1}{4}$  sec. 19, T. 34 N., R. 7 E., St. Francois County, Missouri, (Eileen H. Kane), GSA Rock Analysis Laboratory, Lee C. Peck, Chemist, December, 1947.
75. Diabase porphyry: Mount Devon, groundmass only; from ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in  $SW\frac{1}{4}$   $SE\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, A. Johannsen, A descriptive Petrography of the Igneous Rocks, University of Chicago Press, vol. 3, p. 322, (W. F. Hillebrand), 1937.
76. Diabase porphyry: Mount Devon, ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in  $SW\frac{1}{4}$   $SE\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, G. A. Muilenburg and S. S. Goldich, Petrography and Petrology of the Mount Devon Diabase Porphyry, Am. Jour. Sci., vol. 26, p. 359, (A. L. Cairns), Missouri State Mining Experiment Station, 1933.
77. Diabase porphyry: Mount Devon, phenocrysts only; from ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in  $SW\frac{1}{4}$   $SE\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, A. Johannsen, A descriptive Petrography of the Igneous Rocks, University of Chicago Press, vol. 3, p. 322, (W. F. Hillebrand), 1937.
78. Diabase porphyry: Mount Devon, phenocrysts only; from ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in  $SW\frac{1}{4}$   $SE\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, G. A. Muilenburg, S. S. Goldich, Petrography and Petrology of the Mount Devon Diabase Porphyry, Am. Jour. Sci. vol. 26, p. 359, (A. L. Cairns), Missouri State Mining Experiment Station, 1933.
79. Diabase porphyry: Mount Devon, phenocrysts only; from ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in  $SW\frac{1}{4}$   $SE\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, S. S. Goldich and G. A. Muilenburg, Labradorite-Hyper-Oranite, Am. Jour. Sci., vol. 237, p. 133, (H. Mundt) MGS Laboratory, 1939.

80. Diabase porphyry: Mount Devon, phenocrysts only; from ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in SW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, G. A Muilenburg and S. S. Goldich, Petrography and Petrology of the Mount Devon Diabase Porphyry, Am. Jour. Sci., vol. 26, p. 359, (T. Kameda), 1933.
81. Diabase porphyry (Devonite): Mount Devon ravine on N. slope of Mount Devon, west of Little St. Francois River narrows in SW $\frac{1}{4}$  SE $\frac{1}{4}$  sec. 14, T. 33 N., R. 6 E., Madison County, Missouri, H. S. Washington, Chemical Analyses of Igneous Rocks, U.S.G.S. Prof. Paper 99, p. 533, analysis 29 (W. F. Hillebrand), 1917.
82. Diabase porphyry dike: Tin Mountain, E $\frac{1}{2}$  NW $\frac{1}{4}$  sec. 30, T. 33 N., R. 5 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1933.
83. Diabase Skrainka: Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1933.
84. Diabase Skrainka: Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (S. S. Goldich), Washington University, St. Louis, Missouri.
85. Diabase Skrainka: Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, E. Haworth, Crystalline Rocks of Missouri, Mo. Geol. Survey, vol. 8, p. 113, (St. Louis Sampling and Testing Works), 1895.
86. Diabase Skrainka: Pine Mountain, bluffs above Little St. Francois River, SW $\frac{1}{4}$  NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 19, T. 33 N., R. 6 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1933.
87. Diabase: NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 23, T. 39 N., R. 4 E., 1238 foot depth, G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 87, (Al Rice), 1956.
88. Gabbro: Middle quarry, Bald Mountain, S $\frac{1}{2}$  W $\frac{1}{2}$  lot 6 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. B. Ellestad), University of Minnesota, Minneapolis, Minnesota.
89. Gabbro: Middle quarry, Pine Mountain, bluffs above little St. Francois River, SW $\frac{1}{4}$  NW $\frac{1}{4}$  SW $\frac{1}{4}$  sec. 19, T. 33 N., R. 6 E., Madison County, Missouri, (R. B. Ellestad), University of Minnesota, Minneapolis, Minnesota.
90. Albitite dike: Bald Mountain quarry near Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. B. Ellestad), University of Minnesota, Minneapolis, Minnesota.
91. Albitite dike: Near Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. B. Ellestad), University of Minnesota, Minneapolis, Minnesota.
92. Albitite dike: Near Skrainka quarry, E $\frac{1}{2}$  lot 4 W., sec. 3, T. 33 N., R. 6 E., Madison County, Missouri, (R. T. Rolufs), MGS Laboratory, 1931.
93. Tuff: Near Shirley, Washington County, Missouri, SE $\frac{1}{4}$  sec. 26, T. 37 N., R. 1 E., G. B. French, Precambrian Geology of Washington County Area, Missouri, thesis, Mo. School of Mines, p. 73, (Al Rice), 1956.

	1	2	3	4	5	6	7
SiO <sub>2</sub>	72.35%	70.47%	57.57%	70.50%	69.23%	68.61%	68.38%
Al <sub>2</sub> O <sub>3</sub>	13.78	13.87	14.34	13.89	13.83	14.84	13.94
Fe <sub>2</sub> O <sub>3</sub>	1.87	3.41	4.75	3.77	1.50	1.48	2.20
FeO	0.36	1.11		1.15	3.31	5.40	3.14
MgO	0.42	0.51	1.52	0.19	.81	.63	.63
CaO	0.87	0.84	4.27	0.62	1.74	1.65	1.70
Na <sub>2</sub> O	4.14	5.03		5.03	3.09	3.70	2.73
K <sub>2</sub> O	4.49	3.39		3.39	4.49	2.28	5.12
H <sub>2</sub> O /	0.54	0.44	3.87	0.42	.76	.26	.58
H <sub>2</sub> O -	0.22	0.05	0.08	0.08	.03		.10
TiO <sub>2</sub>	0.44	0.69	1.02	0.56	.62		.77
P <sub>2</sub> O <sub>5</sub>	0.13	0.09		0.08	.16	.23	.21
MnO	0.06	0.31	0.40	0.28	.09		.10
ZrO <sub>2</sub>		0.02		0.01			.04
F					.07		
CO <sub>2</sub>							
S							.04
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO	0.20						
Less O for F or S					-.03		-.04
TOTAL	99.87%	100.23%	87.91%	99.97%	99.70%	99.08%	99.66%

	8	9	10	11	12	13	14
SiO <sub>2</sub>	75.89%	77.76%	76.26%	75.00%	68.14%	76.35%	76.13%
Al <sub>2</sub> O <sub>3</sub>	11.93	10.83	11.53	12.25	14.37	11.63	11.90
Fe <sub>2</sub> O <sub>3</sub>	2.74	1.19	2.22	1.84	2.43	1.24	1.52
FeO	.14	.45	.31	.27	1.60	1.27	.94
MgO	.10	.05	.03	.13	.19	.12	.08
CaO	.03	.04	.00	.08	.46	.39	.34
Na <sub>2</sub> O	3.24	.12	.13	1.04	1.31	3.53	3.74
K <sub>2</sub> O	5.13	8.89	8.52	8.42	9.76	4.50	4.55
H <sub>2</sub> O /	.23	.34	.46	.33	.37	.35	.25
H <sub>2</sub> O -	.08	.04	.03	.08	.05	.04	.09
TiO <sub>2</sub>	.21	.11	.13	.20	.52	.16	.16
P <sub>2</sub> O <sub>5</sub>	.04	.00	.01	.02	.11	.00	.01
MnO	.03	.04	.03	.02	.05	.08	.09
ZrO <sub>2</sub>							
F	.02	.02	.02	.05	.05	.10	.10
CO <sub>2</sub>							
S							
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less O for F or S	-.01	-.01	-.01	-.02	-.02	-.04	-.04
TOTAL	99.80%	99.87%	99.67%	99.71%	99.39%	99.72%	99.86%

	15	16	17	18	19	20	21
SiO <sub>2</sub>	75.36%	72.84%	71.88%	71.56%	71.33%	69.67%	69.54%
Al <sub>2</sub> O <sub>3</sub>	11.63	13.21	12.88	14.82	12.55	15.18	14.77
Fe <sub>2</sub> O <sub>3</sub>	1.64	1.38	3.05	3.36	3.75	1.64	6.58
FeO	1.26	1.85	1.05	.51	.85	1.35	.46
MgO	.40	.35	.33	1.10	.58	.56	.29
CaO	.63	.19	1.13	1.29	.94	1.77	1.34
Na <sub>2</sub> O	3.93	2.76	4.21	3.83	4.52	3.21	3.03
K <sub>2</sub> O	4.25	5.96	4.46	4.08	4.20	5.39	4.24
H <sub>2</sub> O /	.33	.37	.26	.60	.30	.68	.18
H <sub>2</sub> O -	.10	.05	.17	.07	.12	.11	
TiO <sub>2</sub>	.33	.31	.22	.36	.55	.59	
P <sub>2</sub> O <sub>5</sub>	.05	.07	.15	.08	.16	.09	.12
MnO	.10	.13	tr.	.27	.04	.38	
ZrO <sub>2</sub>							
F		.02					
CO <sub>2</sub>							
S							
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO			.02		.15		
Less O for F or S		-.01					
TOTAL	100.00%	99.48%	99.81%	100.85%	100.04%	100.62%	100.55%

	22	23	24	25	26	27	28
SiO <sub>2</sub>	63.15%	76.45%	71.1 %	69.1 %	74.6 %	66.8 %	68.54%
Al <sub>2</sub> O <sub>3</sub>	14.81	11.85	13.8	13.0	11.0	15.1	14.44
Fe <sub>2</sub> O <sub>3</sub>	5.80	2.02	6.0	7.7	6.0	7.3	2.55
FeO	1.20	.27					1.80
MgO	1.20	.06	tr.	.1	tr.	.6	.47
CaO	1.99	.19	.2	1.2	tr.	1.5	1.96
Na <sub>2</sub> O	4.15	3.17	4.2	3.4	1.7	4.5	2.55
K <sub>2</sub> O	5.33	5.30	4.4	4.9	6.9	4.0	6.28
H <sub>2</sub> O /	.80	.18					.56
H <sub>2</sub> O -	.08	.09					.03
TiO <sub>2</sub>	.71	.17	.18	.44	.16	.52	.37
P <sub>2</sub> O <sub>5</sub>	.20	.00	.04	.07	.04	.14	.12
MnO	.33	.03	.08	.14	.05	.14	.14
ZrO <sub>2</sub>							
F		.02					.07
CO <sub>2</sub>							
S			tr.	tr.	tr.	tr.	
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less O for F or S		-.01					-.03
TOTAL	99.98%	99.79%	100.00%	100.05%	100.45%	100.60%	99.85%

	29	30	31	32	33	34	35
SiO <sub>2</sub>	72.75%	60.0 %	64.38%	66.43%	68.76%	63.43%	67.04%
Al <sub>2</sub> O <sub>3</sub>	13.19	14.5	15.81	14.48	14.16	14.82	14.72
Fe <sub>2</sub> O <sub>3</sub>	1.39	12.0	3.00	1.90	2.02	5.58	2.32
FeO	1.51		2.03	3.42	1.91	1.07	1.61
MgO	.25	1.7	.86	1.35	.94	1.28	.64
CaO	.55	3.6	.48	1.70	1.81	2.47	1.40
Na <sub>2</sub> O	2.40	2.8	3.12	4.74	2.68	4.47	4.02
K <sub>2</sub> O	6.86	3.7	8.36	3.05	5.89	4.86	6.78
H <sub>2</sub> O /	.30		.14	1.00	.60	.60	.25
H <sub>2</sub> O -	.03		.07	.09	.03	.06	.05
TiO <sub>2</sub>	.31	1.26	.53	.77	.35	.69	.51
P <sub>2</sub> O <sub>5</sub>	.06	.28	.08	.33	.11	.19	.12
MnO	.10	.18	.48	.17	.11	.32	.14
ZrO <sub>2</sub>							
F	.02						
CO <sub>2</sub>							
S		tr.		.04	.07	.06	.11
BaO							
Cr <sub>2</sub> O <sub>3</sub>				.00	.00	.00	.00
NiO							
Less O for F or S	-.01						
TOTAL	99.71%	100.02	99.38%	99.47%	99.44%	99.90%	99.71%

	36	37	38	39	40	41	42
SiO <sub>2</sub>	49.66%	61.41%	77.05%	73.98%	75.65%	77.85%	77.76%
Al <sub>2</sub> O <sub>3</sub>	15.05	14.44	11.77	14.32	12.35	11.53	11.70
Fe <sub>2</sub> O <sub>3</sub>	10.44	2.79	2.33		1.08	.71	.68
FeO	1.27	5.35				.58	.51
MgO	2.64	1.72			0.62	.09	.10
CaO	6.45	4.25	2.21	1.04	1.72	.73	.36
Na <sub>2</sub> O	1.22	2.93	2.90	4.56	2.96	3.72	3.67
K <sub>2</sub> O	5.41	3.79	3.88	3.32	4.12	4.19	4.32
H <sub>2</sub> O /	2.17	.46	0.52		0.54	.26	.31
H <sub>2</sub> O -	.12	.08			0.03	.08	.06
TiO <sub>2</sub>	1.15	1.56			0.10	.14	.06
P <sub>2</sub> O <sub>5</sub>	.32	.21	0.023			0.03	.00
MnO	.22	.45				0.00	.01
ZrO <sub>2</sub>		.03				.01	
F							.14
CO <sub>2</sub>	3.72						
S							
BaO	.04						
Cr <sub>2</sub> O <sub>3</sub>							
NiO	.00						
Less O for F or S							-.06
TOTAL	99.88%	99.47%	100.68%	97.22%	99.37%	99.92%	99.62%

	43	44	45	46	47	48	49
SiO <sub>2</sub>	77.19%	76.81%	76.70%	76.59%	76.44%	76.09%	76.00%
Al <sub>2</sub> O <sub>3</sub>	12.74	12.23	12.69	12.10	12.48	12.57	12.47
Fe <sub>2</sub> O <sub>3</sub>	1.23	.52	.46	.64	.44	.96	1.59
FeO	1.00	.41	.43	.51	.45	.49	.61
MgO	.24	.12	.10	.14	.05	.04	.23
CaO	.48	.98	.35	.53	.95	.55	.53
Na <sub>2</sub> O	4.89	3.85	3.62	3.25	3.67	3.68	4.02
K <sub>2</sub> O	1.07	4.59	4.92	5.38	4.84	4.56	3.39
H <sub>2</sub> O /	.41	.26	.40	.37	.13	.60	.23
H <sub>2</sub> O -	.11	.01	.08	.13	.05	.07	.11
TiO <sub>2</sub>	.17	.08	.06	.11	.07	.17	.11
P <sub>2</sub> O <sub>5</sub>	.03	tr.	.00	.02	.00	.05	.07
MnO		.00 (004)	.02	.02	.00	.06	.00 (004)
ZrO <sub>2</sub>		.02				.08	
F		.14	.15	.26	.41		
CO <sub>2</sub>		.07					.33
S		.01			.02		
BaO		.01			.01		
Cr <sub>2</sub> O <sub>3</sub>							
NiO		.00					.00
Less 0 for F or S		-.07	-.06	-.11	-.18		
TOTAL	99.56%	100.07%	99.92%	99.94%	99.83%	99.97%	99.69%

	50	51	52	53	54	55	56
SiO <sub>2</sub>	75.84%	75.64%	75.50%	75.48%	75.28%	74.27%	73.53%
Al <sub>2</sub> O <sub>3</sub>	12.57	11.42	12.74	12.32	12.80	12.12	12.12
Fe <sub>2</sub> O <sub>3</sub>	.77	1.16	.46	.73	1.14	.76	1.77
FeO	.77	.68	1.12	1.45	.89	1.66	1.35
MgO	.19	.97	.19	.35	.29	.18	.10
CaO	.64	.31	.63	1.00	.58	.98	.86
Na <sub>2</sub> O	3.48	3.91	3.43	2.28	2.72	3.82	3.88
K <sub>2</sub> O	4.58	5.07	4.66	5.06	5.24	4.24	4.85
H <sub>2</sub> O /	.61	.34	.68	.53	.44	.65	.31
H <sub>2</sub> O -	.09	.16	.13	.09	.10	.17	.11
TiO <sub>2</sub>	.13	.26	.14	.20	.17	.59	.69
P <sub>2</sub> O <sub>5</sub>	.01	.05	.04	.06	.02	.07	.08
MnO	.03	.37	.05			.46	.09
ZrO <sub>2</sub>		.04		none			.06
F	.12		.13				
CO <sub>2</sub>						.03	
S							
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less 0 for F or S	-.05		-.05				
TOTAL	99.78%	100.38%	99.85%	99.55%	99.67%	100.00%	99.80%

	57	58	59	60	61	62	63
SiO <sub>2</sub>	72.70%	72.55%	72.44%	72.42%	72.35%	72.28%	70.69%
Al <sub>2</sub> O <sub>3</sub>	13.97	13.09	12.75	13.82	13.78	13.82	12.64
Fe <sub>2</sub> O <sub>3</sub>	.81	1.80	2.00	2.31	1.87	1.81	2.13
FeO	1.38	1.47	1.92	.55	.36	1.50	2.01
MgO	.58	.39	.09	.48	.42	.21	.85
CaO	1.09	.80	1.01	.91	.87	.89	1.30
Na <sub>2</sub> O	3.63	4.18	3.39	7.85	4.14	4.20	4.04
K <sub>2</sub> O	4.74	4.51	4.32	.19	4.49	4.37	4.38
H <sub>2</sub> O /	.42	.51	.49	1.05	.54	.41	.46
H <sub>2</sub> O -	.09	.11	.11	.09	.22	.16	.13
TiO <sub>2</sub>	.29	.40	.45	.64	.44	.21	.52
P <sub>2</sub> O <sub>5</sub>	.08	.06	.15	.12	.13	.17	.19
MnO	.04	.04	.05	.09	.06	.02	.13
ZrO <sub>2</sub>			.03	.03			
F	.07						.12
CO <sub>2</sub>							
S			.03				
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO		none			.20		
Less O for F or S	-.03		-.01				-.05
TOTAL	99.86%	99.91%	99.22%	100.55%	99.87%	100.05%	99.54%

	64	65	66	67	68	69	70
SiO <sub>2</sub>	69.94%	69.70%	68.57%	66.55%	64.86%	72.23%	70.71%
Al <sub>2</sub> O <sub>3</sub>	15.19	14.80	15.94	15.52	15.31	13.21	14.12
Fe <sub>2</sub> O <sub>3</sub>	1.88	1.26	1.40	1.57	1.63	.75	1.26
FeO	.60	1.80	2.71	2.88	3.87	1.98	2.19
MgO	.92	.76	1.21	1.28	1.94	.22	.30
CaO	1.15	1.75	2.63	3.04	2.37	.88	.96
Na <sub>2</sub> O	3.95	4.18	2.70	4.34	4.62	3.19	3.84
K <sub>2</sub> O	4.29	3.92	3.53	3.18	3.12	5.55	5.11
H <sub>2</sub> O /	.85	.76	.53	.74	1.04	.77	.54
H <sub>2</sub> O -	.14	.13	.11	.11	.07	.05	.09
TiO <sub>2</sub>	.25	.40	.35	.48	.46	.34	.41
P <sub>2</sub> O <sub>5</sub>	.13	.14	.14	.16	.29	.06	.06
MnO	.03	.07		.08	.12	.06	.10
ZrO <sub>2</sub>							
F		.07		.07		.10	.08
CO <sub>2</sub>							
S							
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less O for F or S		-.03		-.03		-.04	-.03
TOTAL	99.32%	99.71%	99.82%	99.97%	99.70%	99.35%	99.74%



	71	72	73	74	75	76	77
SiO <sub>2</sub>	72.7 %	72.0 %	75.0 %	55.03%	46.88%	46.62%	55.55%
Al <sub>2</sub> O <sub>3</sub>	13.0	13.0	11.7	15.02	17.27	19.74	
Fe <sub>2</sub> O <sub>3</sub>	4.7	5.0	3.9	3.14	2.47	4.46	30.33
FeO				5.62	8.84	6.25	
MgO	tr.	.1	tr.	4.69	6.73	4.68	.60
CaO	.7	.6	.6	6.56	8.65	8.44	4.66
Na <sub>2</sub> O	2.7	3.5	3.7	2.85	2.51	2.88	3.53
K <sub>2</sub> O	5.7	5.4	4.2	2.07	1.25	1.61	5.33
H <sub>2</sub> O /				2.22	3.30	2.78	
H <sub>2</sub> O -				.08	.28	.19	
TiO <sub>2</sub>	.15	.20	.18	1.16	1.64	1.48	
P <sub>2</sub> O <sub>5</sub>	.02	.04	.09	.44	.35	.37	
MnO	.06	.08	.06	.13	.15	.07	
ZrO <sub>2</sub>					none		
F							
CO <sub>2</sub>				.53		.18	
S	tr.	tr.	.01	.17	tr.	.10	
BaO				.06	tr.		
Cr <sub>2</sub> O <sub>3</sub>					tr?		
NiO							
Less O for F or S				-.08			
TOTAL	99.73%	99.92%	99.44%	99.69%	100.32%	99.85%	100.00

	78	79	80	81	82	83	84
SiO <sub>2</sub>	51.97%			49.30%	48.57%	47.53%	47.27%
Al <sub>2</sub> O <sub>3</sub>	28.25			19.53	17.41	18.70	16.31
Fe <sub>2</sub> O <sub>3</sub>	1.52			3.19	5.62	2.92	2.33
FeO	0.63			6.39	9.53	9.86	10.78
MgO	0.30			5.02	3.77	6.52	7.35
CaO	5.48			7.53	7.66	8.01	8.63
Na <sub>2</sub> O	3.09	3.72	2.71	2.81	2.13	3.09	3.29
K <sub>2</sub> O	4.52	3.91	1.66	2.39	1.16	.76	.60
H <sub>2</sub> O /	3.40			2.38	0.54		.52
H <sub>2</sub> O -	0.16			.20	.72	.08	.08
TiO <sub>2</sub>				1.18	.75	1.07	2.10
P <sub>2</sub> O <sub>5</sub>				.25	.34	.36	.38
MnO				.11	.30	.19	.19
ZrO <sub>2</sub>					.02	.03	
F							
CO <sub>2</sub>	0.51		.22				.08
S					.05	.13	.10
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less O for F or S					-.01		-.05
TOTAL	99.83%	7.63%	4.69%	100.24%	98.56%	99.25%	99.96%

	85	86	87	88	89	90	91
SiO <sub>2</sub>	46.94%	46.43%	45.6 %	76.75%	71.25%	74.43%	76.01%
Al <sub>2</sub> O <sub>3</sub>	16.91	18.51	19.3	11.39	12.60	12.11	12.24
Fe <sub>2</sub> O <sub>3</sub>	12.53	3.56	15.6	1.05	.99	.52	.04
FeO	4.16	9.42		1.26	3.12	1.36	1.39
MgO	8.20	6.20	6.7	.15	1.06	.94	.43
CaO	9.00	7.08	4.1	.24	1.93	1.41	1.36
Na <sub>2</sub> O	2.15	2.76	2.2	4.00	3.92	6.89	6.57
K <sub>2</sub> O	.54	1.50	2.4	4.39	3.71	.14	.03
H <sub>2</sub> O <i>f</i>	.28	2.02		.20	.58	.50	.47
H <sub>2</sub> O <i>-</i>		.16		.06	.06	.06	.04
TiO <sub>2</sub>		1.30	1.46	.19	.63	.21	.19
P <sub>2</sub> O <sub>5</sub>	.28	.34	.21	.02	.12	.05	.02
MnO		.23	.08	.09	.10	.08	.07
ZrO <sub>2</sub>		.02					
F							
CO <sub>2</sub>			.1			1.08	1.17
S		.18	.01				
BaO							
Cr <sub>2</sub> O <sub>3</sub>							
NiO							
Less O for F or S		-.08					
TOTAL	100.77%	99.63%	97.76	99.79%	100.13%	99.78%	100.03%

	92	93
SiO <sub>2</sub>	79.67%	61.6 %
Al <sub>2</sub> O <sub>3</sub>	11.27	13.0
Fe <sub>2</sub> O <sub>3</sub>	.34	11.0
FeO	.42	
MgO	.17	1.2
CaO	.77	2.7
Na <sub>2</sub> O	6.02	4.6
K <sub>2</sub> O	.09	2.4
H <sub>2</sub> O <i>f</i>	.67	
H <sub>2</sub> O <i>-</i>	.09	
TiO <sub>2</sub>	.27	.80
P <sub>2</sub> O <sub>5</sub>	.04	.36
MnO	.03	.10
ZrO <sub>2</sub>	.06	
F		
CO <sub>2</sub>		2.8
S		tr.
BaO		
Cr <sub>2</sub> O <sub>3</sub>		
NiO		
Less O for F or S		
TOTAL	99.91%	100.56