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APPENDICES

APPENDIX I

List of rock samples from the Southern Kitakami area together with their investigation-methods.

Sample No.	Age	Rock name	Point counting	XRF	EPMA (spinel)
93120205	Carboniferous	Volcanic arenite	*		
93120206	Carboniferous	Volcanic arenite	*		*
93120207	Carboniferous	Siltstone			*
93120208	Carboniferous	Sandy siltstone			*
93120209	Carboniferous	Feldspathic litharenite	*		
97031501	Triassic	Plagioclase arenite			
97031502	Cretaceous	Plagioclase arenite			
97031503	Triassic	Plagioclase arenite		*	
97031601	Cretaceous	Plagioclase arenite	*		
97031603	Devonian	Feldspathic litharenite	*		
97031604	Devonian	Lithic arkose			*
97031605-1	Carboniferous	Feldspathic litharenite			
97031605-2	Carboniferous	Volcanic arenite			
97031605-3	Carboniferous	Feldspathic litharenite			*
97031605-4	Carboniferous	Sandy siltstone			
97031605-5	Carboniferous	Volcanic arenite	*		
97031606	Carboniferous	Plagioclase arenite	*		
97031607	Carboniferous	Siltstone			
97031611	Devonian	Feldspathic litharenite		*	
97031612	Devonian	Lithic arkose		*	
97031613	Devonian	Feldspathic litharenite		*	
97031614	Devonian	Feldspathic litharenite		*	
97031701	Permian	Plagioclase arenite	*		

Sample No.	Age	Roack name	Point counting	XRF	EPMA (spinel)
97031702	Permian	Plagioclase arenite	*		
97031703	Triassic	Plagioclase arenite	*		* (without EPMA)
97031704	Jurassic	Plagioclase arenite	*		
97031705	Jurassic	Plagioclase arenite	*		
97031706	Jurassic	Plagioclase arenite	*		
97031707	Jurassic	Plagioclase arenite			
97031708	Triassic	Plagioclase arenite	*		
97031709	Jurassic	Plagioclase arenite	*		
97031710	Jurassic	Plagioclase arenite	*		
97031711	Jurassic	Plagioclase arenite		*	
97031712	Jurassic	Plagioclase arenite		*	
97031713	Jurassic	Plagioclase arenite		*	
97031714	Jurassic	Plagioclase arenite		*	
97031715	Jurassic	Plagioclase arenite		*	
97031801	Permian	Calclithite			
97031803	Permian	Plagioclase arenite		*	
97031804	Permian	Plagioclase arenite		*	
97112101	Carboniferous	Volcanic arenite	*		
97112102	Carboniferous	Feldspathic litharenite			
97112103	Carboniferous	Volcanic arenite	*		
97112104	Carboniferous	Basalt			*
97112105	Carboniferous	Volcanic arenite	*		
97112106	Carboniferous	Volcanic arenite	*		
97112201	Carboniferous	Volcanic arenite			
97112202	Carboniferous	Basalt			
97112203	Carboniferous	Feldspathic litharenite	*		
97112204	Carboniferous	Lithic arkose	*		
97112205	Carboniferous	Feldspathic litharenite	*		

Sample No.	Age	Roack name	Point counting	XRF	EPMA (spinel)
97112206	Carboniferous	Feldspathic litharenite	*		
97112207	Carboniferous	Siltstone			
97112208	Carboniferous	Siltstone			
97112209	Carboniferous	Metamorphosed sandy siltstone			
97112210	Carboniferous	Feldspathic litharenite			
97112211	Carboniferous	Volcanic arenite	*		
97112212	Carboniferous	Volcanic arenite	*		
97112213	Carboniferous	Feldspathic litharenite			
97112214	Carboniferous	Feldspathic litharenite			
97112215	Carboniferous	Lithic arkose			
97112216	Carboniferous	Feldspathic litharenite			
97112217	Carboniferous	Calclithite			*
97112218	Carboniferous	Siltstone			
97112219	Carboniferous	Volcanic arenite	*		
97112301	Carboniferous	Feldspathic litharenite	*		
97112302	Carboniferous	Feldspathic litharenite	*		*
97112303	Carboniferous	Calclithite			
97112304	Carboniferous	Lithic arkose	*		
97112305	Carboniferous	Plagioclase arenite	*		
97112306	Carboniferous	Feldspathic litharenite			
97112307	Carboniferous	Calclithite			
97112308	Carboniferous	Calclithite			
97112309	Carboniferous	Lithic arkose			
97112310	Carboniferous	Lithic arkose			
97112311	Carboniferous	Lithic arkose			
97112312	Carboniferous	Andesite			
97112313	Carboniferous	Siltstone			

Sample No.	Age	Roack name	Point counting	XRF	EPMA (spinel)
97112314	Carboniferous	Andesite			
97112315	Carboniferous	Feldspathic litharenite	*		
97112316	Carboniferous	Sandy siltstone			*
97112317	Carboniferous	Feldspathic litharenite	*		
97112318	Carboniferous	Lithic arkose	*		

APPENDIX II

Major oxides of sandstones in the Southern Kitakami area analysed by XRF

Sample No.	Age	SiO ₂	TiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MnO	MgO	K ₂ O	Na ₂ O	P ₂ O ₅	LOI	SUM
97031711	Jurassic	79.7	0.29	10.4	1.14	0.39	0.008	0.32	3.28	2.73	0.029	1.68	99.97
97031712	Jurassic	79.9	0.32	10.2	1.29	0.43	0.01	0.33	3.19	2.61	0.033	1.75	100.06
97031803	Permian	57.0	0.97	16.2	9.02	3.91	0.159	2.70	3.39	3.24	0.215	3.04	99.84
97031804	Permian	53.8	1.00	17.0	9.49	4.62	0.163	3.02	2.84	4.00	0.217	3.43	99.58
97031503	Triassic	60.2	0.90	18.3	7.34	1.19	0.052	2.53	1.89	3.22	0.188	5.07	100.88
97031713	Jurassic	71.2	0.20	13.0	1.32	3.86	0.018	0.57	2.83	3.45	0.036	4.26	100.74
97031714	Jurassic	70.6	0.21	13.3	1.32	3.66	0.019	0.58	2.82	3.52	0.038	4.18	100.25
97031715	Jurassic	69.5	0.38	12.9	1.81	4.44	0.027	0.62	2.36	3.70	0.052	4.57	100.36
97031611	Devonian	83.3	0.26	7.7	2.96	0.22	0.046	1.12	1.83	1.33	0.041	1.44	100.25
97031612	Devonian	70.1	0.40	12.9	6.06	0.82	0.113	2.33	2.18	2.75	0.076	2.49	100.22
97031613	Devonian	74.7	0.45	13.1	2.11	0.81	0.044	0.84	3.88	3.48	0.083	1.31	100.81
97031614	Devonian	64.6	0.54	15.4	7.42	0.94	0.135	2.85	2.82	2.71	0.096	3.04	100.55

APPENDIX III

Selected fossils from the Southern Kitakami area relating to the well-known area.

Age	Fossil	Relative Area
Silurian	Coral fauna: - <i>Nipponophyllum</i> - <i>Schedohalysites</i>	Eastern Australia
	Trilobite fauna: - <i>Encrinurus kitakamiensis</i>	New South Wales
Late Devonian	Plant: - <i>Leptophloeum rhombicum</i>	Southern China
	- <i>Leptophloeum australe</i>	Australia and China
	- <i>Lepidodendron</i>	
	- <i>Cyclostigma</i>	
Early Carboniferous	Characteristic Corals: - <i>Pseudouralinia tangpakouensis</i>	Southern China
	- <i>Kueichouphyllum heishihkuanense</i>	
	- <i>Yuanophyllum kansuense</i>	
	- <i>Spongophyllum</i>	Bohemia and Australia
	- <i>Australophyllum</i>	
	Brachiopod fauna: <i>Kitakamithyris</i>	Eastern Australia
<i>Archaeocalamites</i> flora	Southern China	
Late Carboniferous	Coral fauna (contain Boreal elements)	Tethys Character
Early Permian	Maiya flora: - <i>Cathaysiopteris</i>	Cathysian (tropical area)
	- <i>Noeggerathiopsis</i>	Gondwana

BIOGRAPHY

The author was born in Chaiyaphum on May 1973. He got the diploma in Analytical Chemistry at the Institute of Analytical Chemistry Training, Department of Science Service, Ministry of Science, Technology, and Environment on March 1994. Then, he started the geology program at the Department of Geology, Faculty of Science, Chulalongkorn University, and got a Bachelor of Science there in March 1997. After that, he continued his Master program in geology at the Department of Geology, Faculty of Science, Chulalongkorn University.

