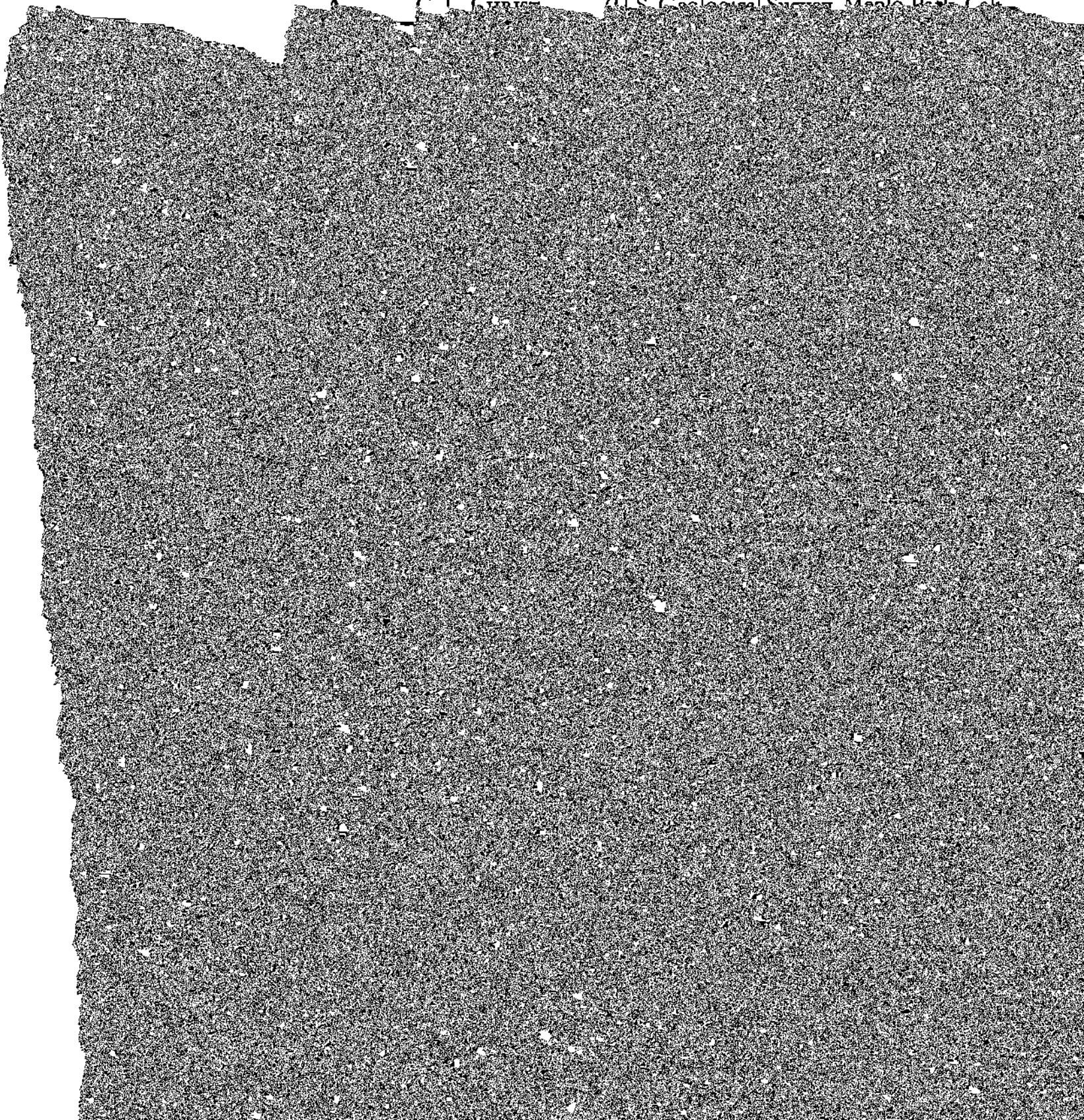
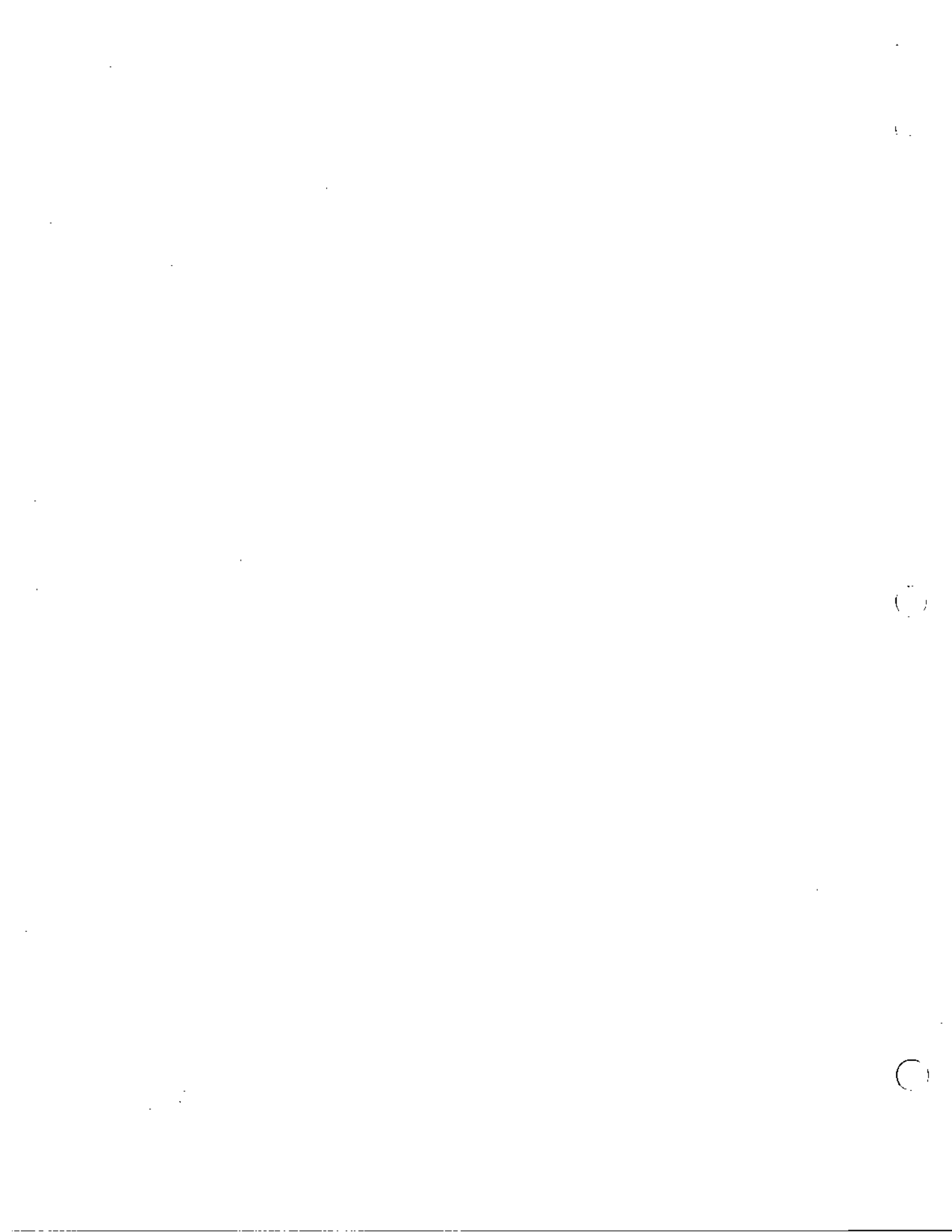


Boron

5

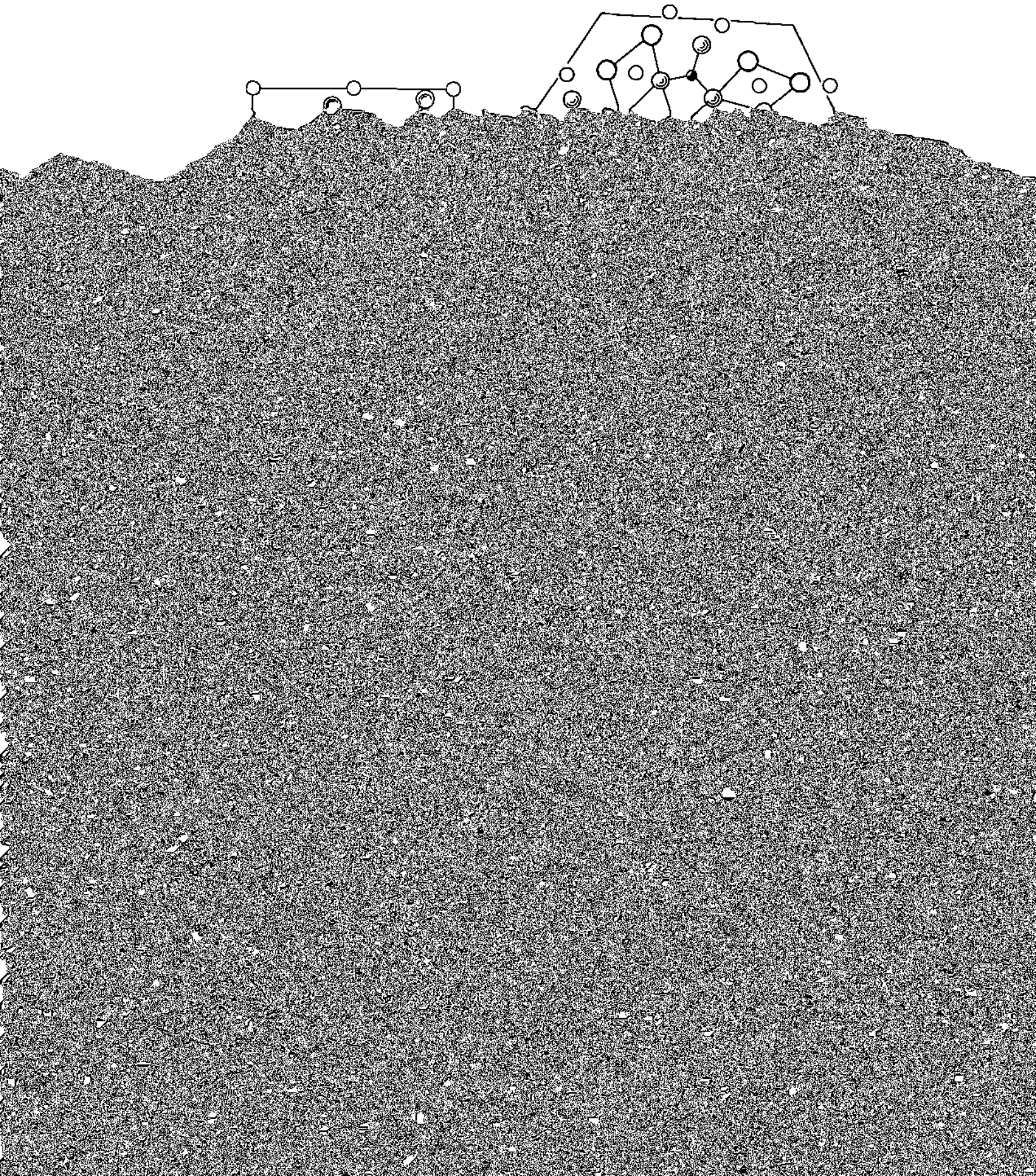
C. I. CHRIST (U.S. Geological Survey, Menlo Park, Calif.)





5-A-4

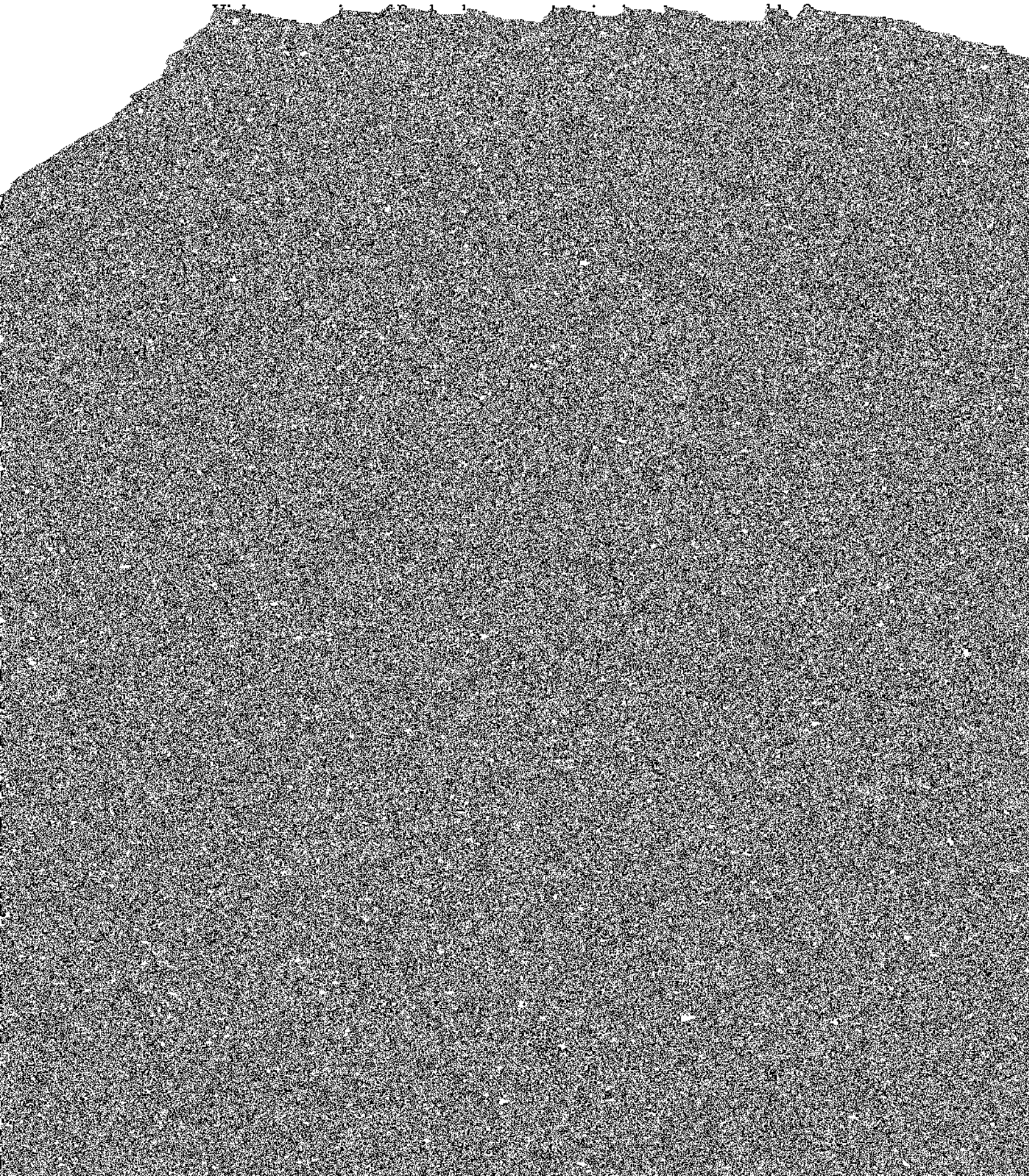
Boron





5-E-2

Boron



5-E-4

Boron

wegian nepheline syenite (HARDER, 1959). The number of analyses is too small to compute a mean and to observe systematic differences in boron between plutonic

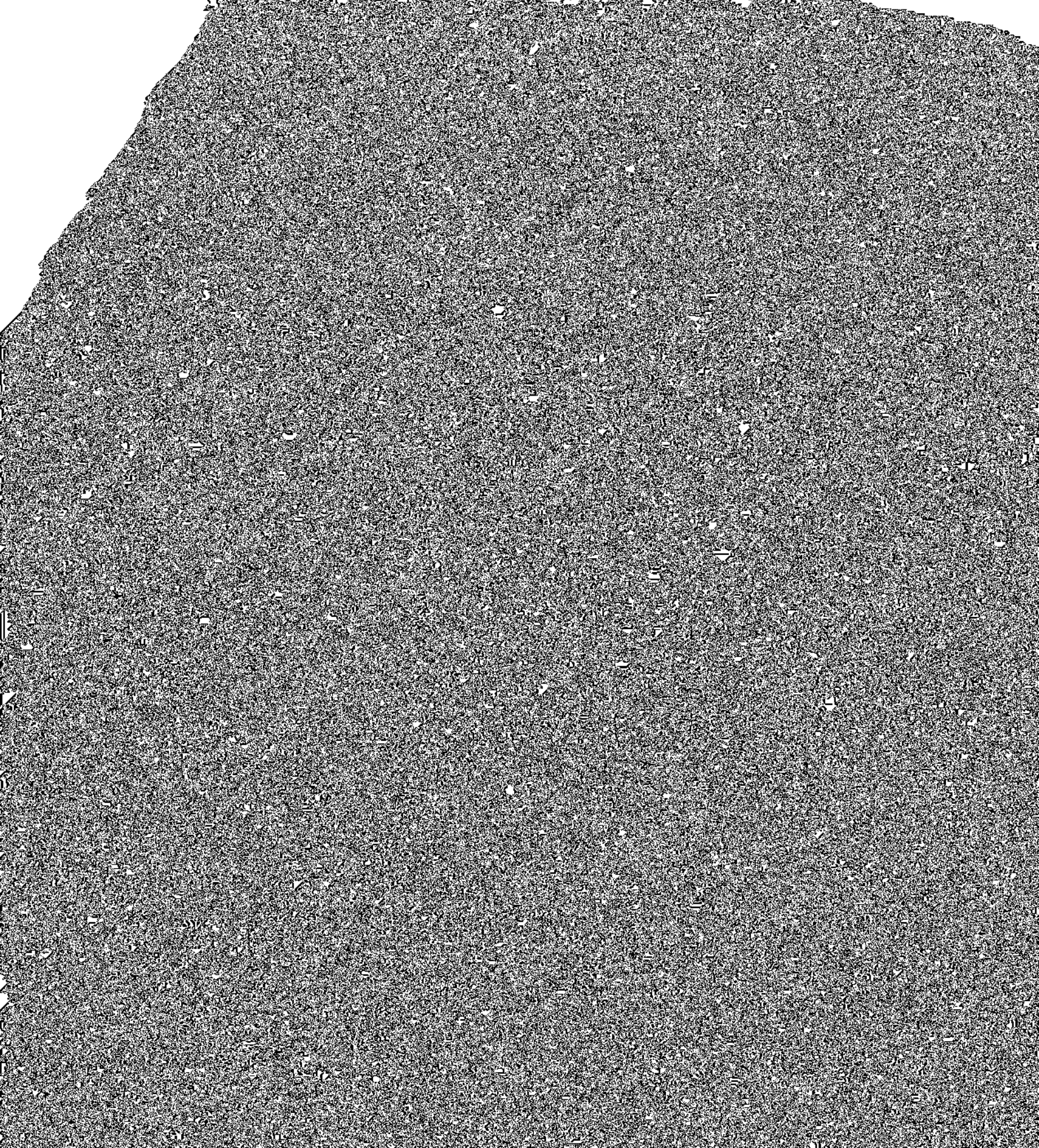


Table 5-E-5 (continued)

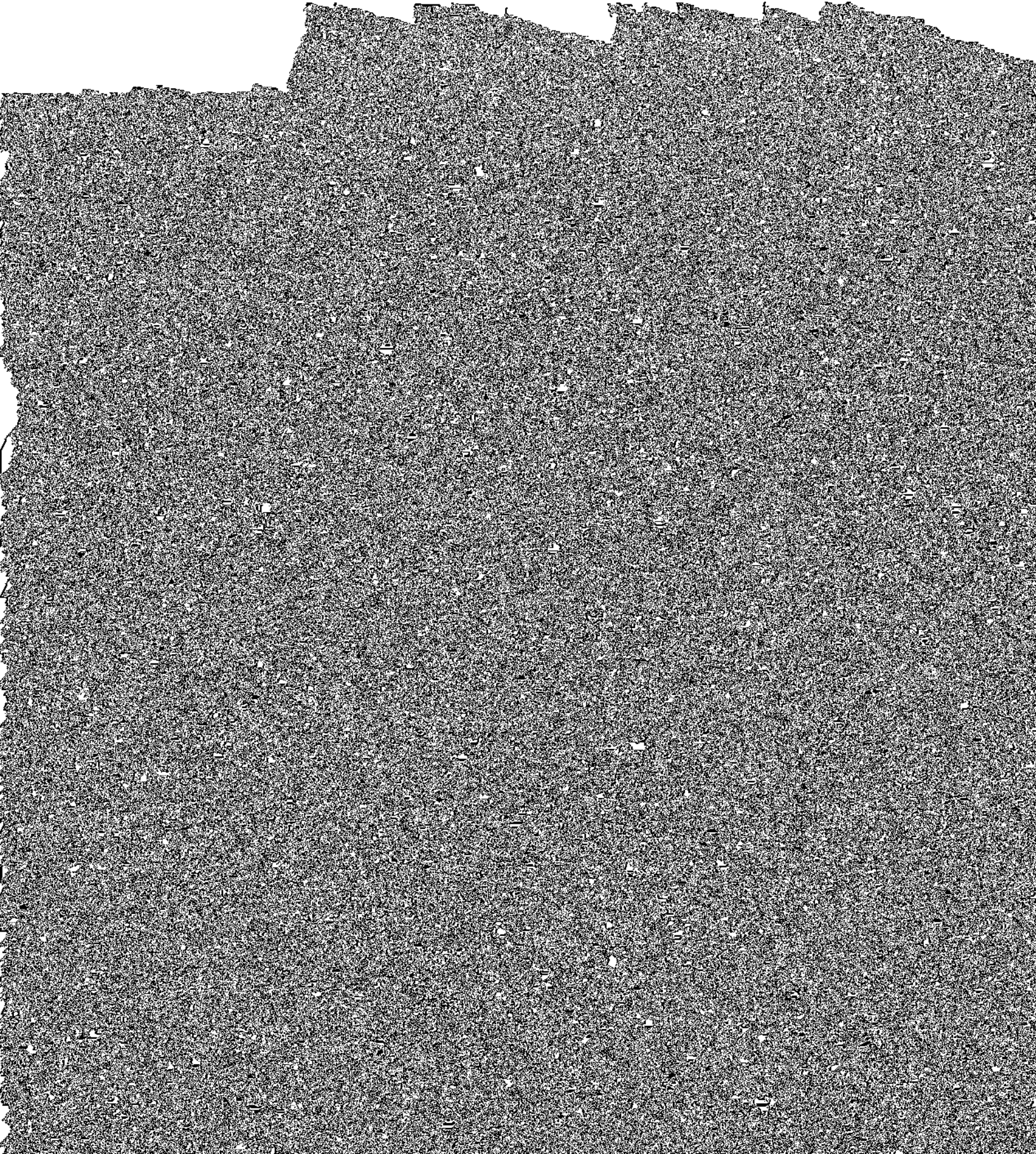
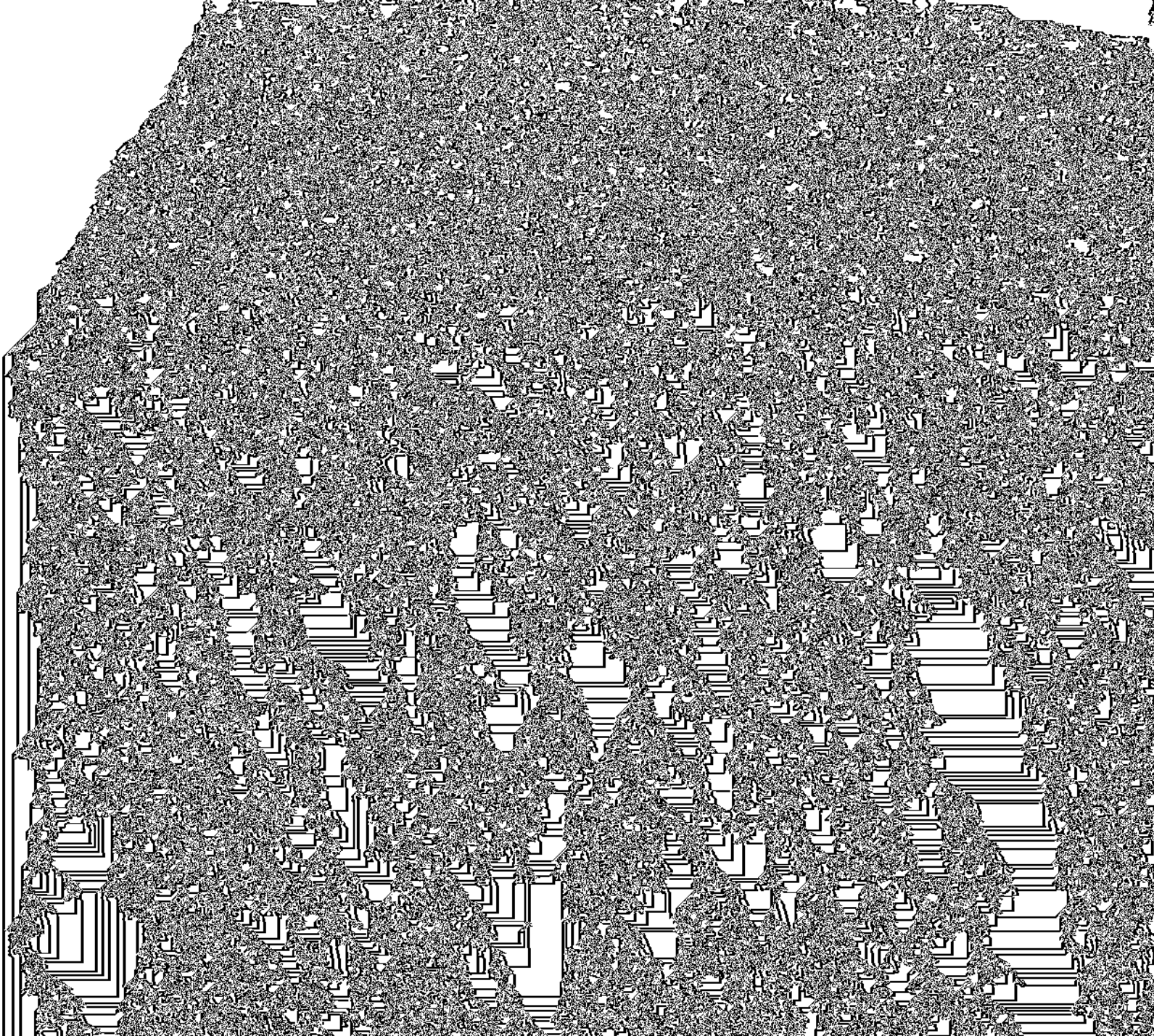
The table content is obscured by a dense, dark, grainy texture that covers the entire lower portion of the page. This appears to be a redaction or a significant scanning artifact. No data points, headers, or footers are legible within this area.

Table 5-E-7. Boron content in silic volcanic rocks. (Analytical method: S)

Rock type	Locality	Number of analyses	Range		Average ppm B	Reference
			ppm B	ppm B		
Rhyolite	Europe	20	1—650			HARDER (1959a)
Liparite (2 composites of 20)	Sardinia Hungary				23	HARDER (1959a)
Rhyolite etc.	Siberia (U.S.S.R.)	87	6—165	24		SUKHORUKOV et al. (1964)
Silicic tuff	Siberia (U.S.S.R.)	45	5—120	26		SUKHORUKOV et al. (1964)
Rhyolite dacite	New Zealand	2	11—20	~16		ELLIS (1963)
Obsidian	New Zealand	2	25—50	~38		ELLIS (1963)
Obsidian	Europe	10	5—155			HARDER (1959a)
Obsidian	Iceland, U.S.A.				73	HARDER (1959a)

a model of ordinary chondrites (about 1 ppm B) or of carbonaceous chondrites (about 7 ppm B) (see Table 5-C-1). The latter figure is close to a tentative mean for ultramafic rocks, but for volatile elements the selection of the model is difficult. The anomalously high concentrations of boron in kimberlite may be an indicator for degassing of the mantle (see Subsection 5-E-I).

The boron content of the oceanic crust (about a quarter of the mass of the total crust) may be similar to the mean value of basaltic rocks of 5 ppm B (see Subsection 5-E-II). The average boron abundance in the upper continental crust has been calculated in Table 5-E-8 as being 13 ppm B. The lower crust is mainly composed of metamorphic rocks. Gneisses and schists generally have lower boron contents than their magmatic or sedimentary equivalents of comparable chemical composition (see Sections E and M). 10 ppm B may be a probable boron value for the continental crust, and the boron content in the crust is about one order of magnitude above that

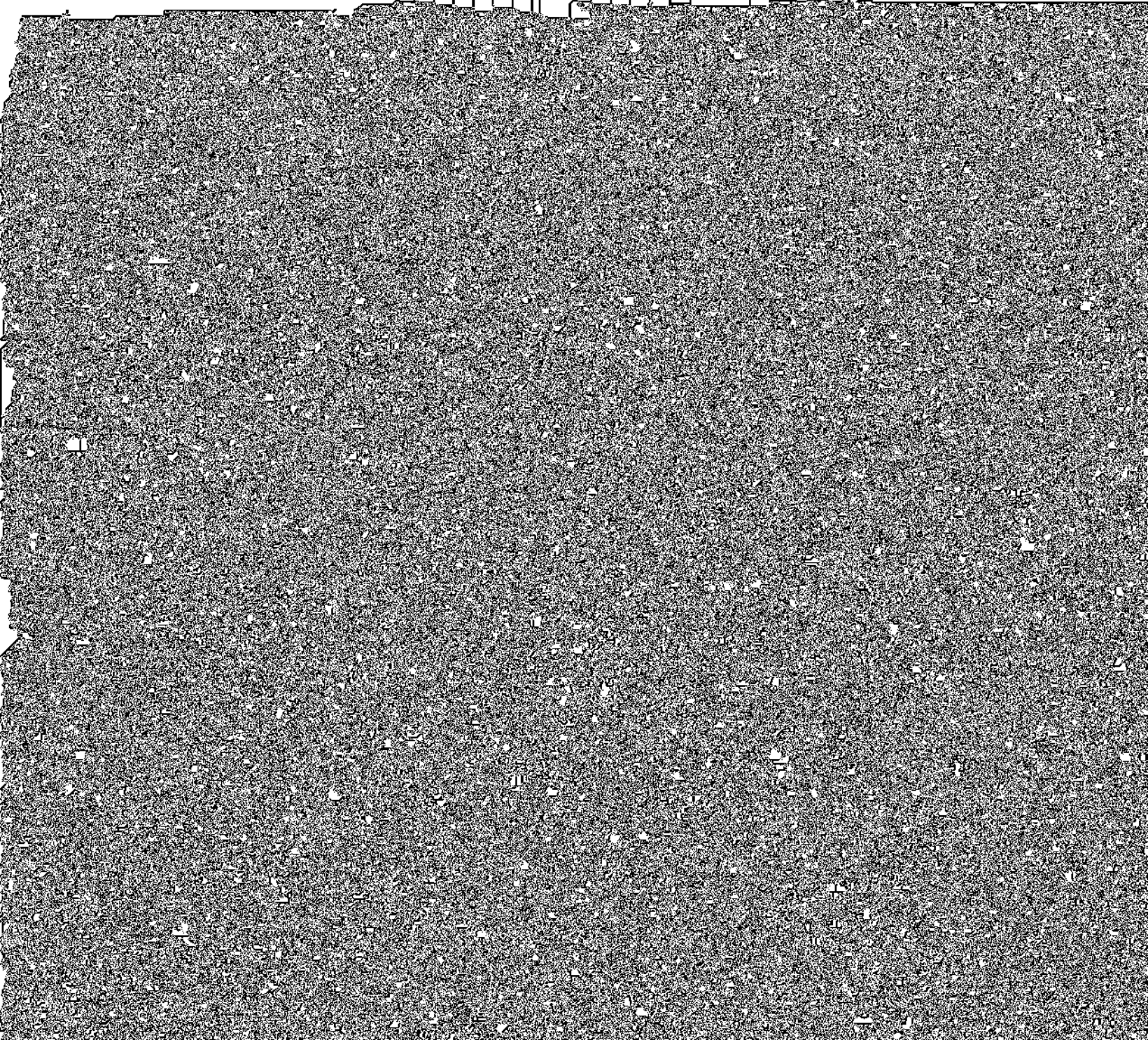
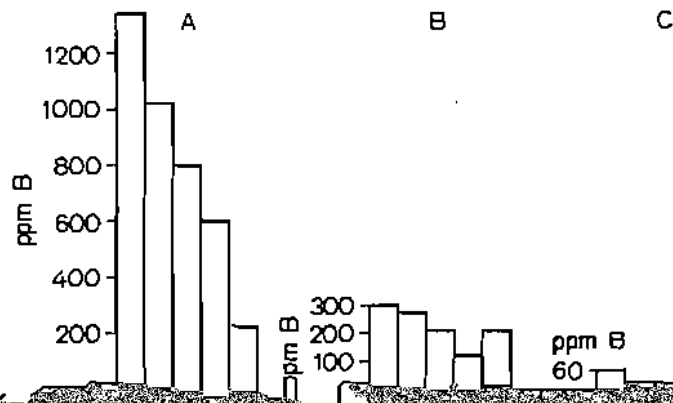


5-F. Behavior in Magmatogenic Processes

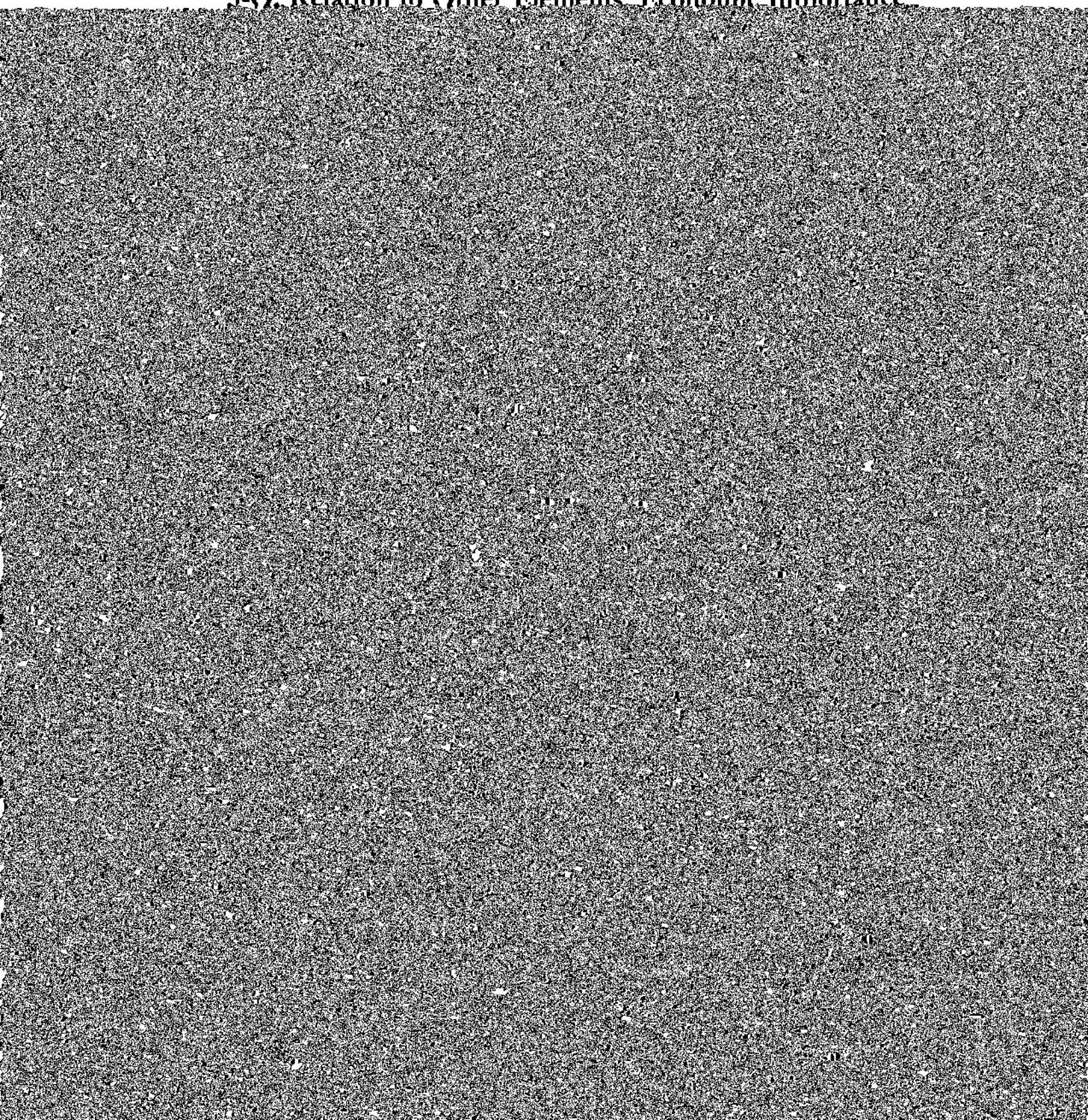
Boron is an element accumulated in the late stages of magmatic crystallization. The primary boron content of magmatic melts is generally not high enough to form

5-K-7

Boron



5-O. Relation to Other Elements. Economic Importance.



5-O-3

Boron

in Larderello, Toscana, Italy, and Kertsch, USSR, Inder Area, eastern Urals). Current-

