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vapor-dominated systems are fewer. Surface fluids are characterized by low Cl and high volatile (B, SO_4 from H_2S, NH_4) contents. Fumarolic and well discharge gases have high CO_2, H_2, and CH_4, and the distribution of carbon and hydrogen isotopes among these gases and steam may provide geothermometers, but problems remain.

HEAT FLOW ON THE SOUTH FLANK OF THE SNAKE RIVER RIFT

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Rifting in southern Idaho has been active for some time. Holocene volcanism, abundant hot springs and hot water wells attest to an anomalous geothermal regime. The preliminary heat flow measurements given below will be refined as additional data become available.

Hole	Lat./Long.	Depth	Gradient	K	Q
MOH-1[a]	42°48.3'N-116°24.3'W	252	31	7.0	2.2
MUR-1[a]	43°11.3'N-116°41.1'W	252	47	6.6	3.1
RR-1[b]	42° 8.0'N-113°21.8'W	274	∿130	2.5	∿3
RR-2[b]	42° 5.6'N-113°21.7'W	194	∿200	3[c]	∿6
RR-3[b]	42° 5.8'N-113°23.6'W	435	∿180	4	∿7
RRGE-1[b]	42° 6.2'N-113°23.0'W	265	∿200	4[c]	∿8

Depth (m) of deepest measurement. Gradient (°C/km) in lower part of hole. K-thermal conductivity (mcal/cm·sec·°C). Q-Heat flow (μcal/cm²·sec). a) In granitic rocks. b) In Quaternary sediments. c) Estimated from adjacent holes.

The measurements in igneous rock appear to be free of local hydrologic disturbances. These heat flows are as high or higher than most in the Basin and Range Province to the south. The "reduced" heat flows (those obtained after allowance for the radioactive heat production of the igneous rocks) are high with respect to the Basin and Range.

The highest values from holes in the Raft River Valley (RR), all of which suffer from some degree of thermal disequilibrium, probably reflect hydrothermal convection at depth. Deep drilling (RRGE-1) now underway under the auspecies of AEC is expected to yield information as to its nature.

PRECAMBRIAN GEOLOGY OF THE TOBACCO ROOT MOUNTAINS, MONTANA

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The core of the Tobacco Root Range, a domal uplift, is composed of regionally metamorphosed pre-Beltian rocks intruded by the Tobacco Root Batholith and bordered by deformed Beltian and post-Beltian sedimentary, intrusive and volcanic rocks. The metamorphic rocks represent an originally stratiform sequence of epiclastic, volcanoclastic, and chemical sedimentary rocks which, along with intercalated igneous intrusive and extrusive rocks, have all been metamorphosed to amphibolite-granulite rank with attendant migmatitization. Lower rank retrogressive metamorphism is restricted to faults, shear zones, and borders of later intrusives. A narrow thermal metamorphic aureole surrounds the Laramide Tobacco Root Batholith. Facies and parageneses distributions depict