(V2) /John J. Naughton. (Hawaii Inst. of Geophysics, Univ. of Hawaii, Honolulu) Volcanic Spectrometry: Kilauea, 1967-68. The inaccessible 1967-68 eruption in the Halemaumau pit crater of Kilauea Volcano, Hawaii, offered an opportunity for remote spectrometric investigations of emitted volatiles. The detection of the characteristic optical absorption of substances in the fume was attempted using the radiation from the fountain as a continuum source. The absorption spectrum from 450 millimicrons in the photographic region, to 14.5 microns in the infrared was investigated. The region from 3.0 to 14.5 microns was most informative, and gave indications of potential use in quantitative analysis. The first attempts gave a H_2O:CO_2:SO_2 ratio of 95%:4%:1%. Precision was ±4% standard deviation, but the uncertainties in applying the corrections for atmospheric components may contribute a large absolute error.

(V3) /R. D. Cadle. /A. L. Lazrus. /J. P. Shedlovsky. (National Center for Atmospheric Research, Boulder, Colo.) Comparison of Particles in the Fume from Kilauea and Mayon Eruptions. Particles in the fume from the Mayon eruption of April-May, 1968 were sampled from aircraft after the more violent features of the eruption had ceased. The collected material was investigated using electron microscopy, an electron microprobe, x-ray diffraction, atomic absorption, and neutron activation. Further studies were also made of the eruption fume particles from Kilauea. The collected material was analyzed by "wet-chemical" techniques including atomic absorption. As in previous studies, the Kilauea particles were largely droplets consisting of dilute, impure, sulfuric acid plus a few crystals tentatively identified as sulfur, calcium sulfate, and ammonium sulfate. The "wet-chemical" analyses demonstrated the presence of soluble calcium, ammonium, and magnesium sulfates. Every type of particle observed at Kilauea was also observed at Mayon, but the droplets from Mayon were much less acidic. They also contained ash particles and minute spheres not observed at Kilauea. The filtered material contained soluble calcium and magnesium sulfates but no ammonium ion, although this may have been converted on the filters to nitrates. Possible mechanisms of the particle formation are discussed.

(V4) /John S. Rinehart. (ESSA Research Laboratories, Boulder, Colo.) Thermal and Seismic Indications of Old Faithful Geyser's Inner Workings. Recent temperature measurements within Old Faithful combined with earlier seismic data, provide a fairly broad understanding of the mechanics of the geyser's action. The geyser tube which is surprisingly deep, probably deeper than 175 m fills suddenly shortly after an eruption. Initially the water in the whole tube superheats, but the upper 60 m soon cools as boiling works its way downward. Finally the hotter water below the 60 m level rises to the top fairly rapidly, again superheating the water in the upper regions, causing the eruption to start. The boiling rapidly cascades downward, thrusting water from the reservoir to continue the eruption.

(V5) /Robert W. Rex. (Institute of Geophysics and Planetary Physics, University of California, Riverside) Geochemical water facies in the Imperial Valley of California. Several chemically distinct water facies are recognizable in the Imperial Valley of California and Mexico. At least two distinct deep saline geothermal brines are recognizable. A low salinity brine is widespread occurring everywhere in the valley on both sides of the border where temperatures of greater than 100°C are encountered with only one exception. This exception is a deep zone underlying the low salinity brine at the south end of the Salton Sea where a hypersaline brine of distinctive composition occurs at depth. The low salinity brine is essentially 1-3 percent salinity chloride brine with only a small amount of bicarbonate and no sulfate present. Free hydrogen sulfide in concentrations in excess of several hundred parts per million is present. The hypersaline brine of about 25 percent salinity is characterized by distinct chemical composition and is apparently restricted to the deep zone at the Salton Sea geothermal field. The low salinity brine is found at the Cerro Prieto steam field in Mexico and in all of the oil wells drilled to date in other parts of the basin. This low salinity geothermal brine is distinctly different from sea water in its dissolved salt composition and is closest to metamorphosed Colorado River water in its chemical composition.

(V6) /Tsvi Meidav. (Institute of Geophysics and Planetary Physics, University of Calif., Riverside). Structural characteristics of the Salton Sea, California. Analysis of data obtained from a boomer-sparker survey by the California Department of Water Resources reveals the presence of numerous, essentially vertical faults in the southern half of the Salton Sea. The faults generally trend N35-40W. The data suggests the presence of horsts, grabens and possibly thrust blocks, and suggests that at least some of the faults are still moving. Downwarping of the sub-bottom sediments is directed towards the middle of the sea, and has probably not ceased as yet. The data, however, indicates that there exists an updoming motion which is continuing at present along an anticlinal axisnear the western shore of the sea.