cation, study of the isotopic composition of atmospheric water vapor, is also given.

L. F. CONOVER (Hydrologic Services Division, U.S. Weather Bureau, Coral Gables, Fla.) *Sub-Tropical Clouds as Shown by Time-Lapse Photography*—The behavior of some sub-tropical clouds is shown by 16-mm time-lapse, color photography. Included is the life cycle of a precipitating cumulus as it grows through a stable environment only to be quickly dissipated; the formation of a strato-cumulus deck at twilight; the evaporation of cumuli as they reach the coastline before noonday heating changes the cloud regime; rotation within cloud streets; a cumulo-nimbus shaft showing rotation and the turbulence of the underside of a roll cloud.

H. H. COOPER, JR. (Ground Water Branch, U.S. Geological Survey, Tallahassee, Fla.) *An Hypothesis Concerning the Dynamic Balance of Fresh Water and Salt Water in a Coastal Aquifer*—Explanations of the dynamic equilibrium between salt water and fresh water in a coastal aquifer commonly assume that the salt water is static. A consideration of some observed phenomena indicates, however, that the salt water moves in a continuous cycle from the sea to the zone of diffusion and back to the sea. This cycle acts to lessen the extent to which salt water occupies an aquifer. The cycle is believed to be energized principally by the to-and-fro motion of the water resulting from ocean tides, fluctuations of fresh-water head, and other forces. The cycle becomes effective as some of the salts in the sea water are transferred to the seaward-flowing fresh water through the process of dispersion in the zone of diffusion. The sea water, lightened by loss of some of its salts, thereupon returns along an upward path to the sea.

ROBERT M. CUNNINGHAM (Aerosol Physics Laboratory, Geophysics Research Directorate, Air Force Cambridge Research Center, Bedford, Mass.) *Details of Atmospheric Structure in and Around Bahaman Cumulus*—Measurements of temperature and humidity with high response equipment (vortex resistance wire thermometer and microwave refractometer) are presented and discussed. These measurements were taken from a B-29 aircraft flying in and around island and ocean cumulus congestus in the Bahamas. Measurements in the short growing stage of cumulus and cumulus bubbles are compared with the dissipating stage. The quasi steady upward flow under the cloud system is described and tentatively related to the periodic almost explosive growth of some of the cumuli.

LEO R. DAVIS AND OTTO E. BERG (U.S. Naval Research Laboratory, Washington 25, D.C.) *Rocket Measurements of the Electron and Ion Fluxes in an Aurora*—Energetic ions and electrons have been detected on a rocket flown through a visible aurora. The rocket was fired at 22h 19m CST on January 25, 1958 at Fort Churchill, Canada. The rocket reached a peak altitude of 178 km and passed through a region of the sky covered by a diffuse surface of intensity I. The instrumentation included three scintillation counters, one which measured the total energy flux of electrons of energy greater than 8 Kev and ions of energy greater than about 30 Kev, one which measured the flux electrons of energy greater than 8 Kev, and one measured the flux and energy spectrum of ions h energies greater than about 30 Kev. The foll results were obtained. (1) The electron flux about km altitude was 1 to 2.5 (erg cm^{-2} sec^{-1} $sterad^{-1}$ few if any of the electrons penetrated below 85 (2) The ion energy flux was about one-hundredth electron flux, consisted of ions having energies bet 50 and 300 Kev, and was absorbed between the tudes 96 and 112 km. Preliminary analyses of th rectional behavior of the particle fluxes above 12 altitude shows that both the electrons and ions roughly isotropic over the upper hemisphere.

ANIRUDDHA DE (Princeton University, Prince N.J.) *Observations on the Deformation Lamell Quartz of Four Indian Tectonites*—Well-developed formation lamellae in quartz of two deformed pe from a meta-conglomerate, and a quartz-mica s from Kharsawan, and of a calcareous quartzite Darjeeling, India, have been studied. The mea angle between optic axis and lamella pole of each show that commonly lamellae form at 10° to 15° the basal plane, as also near ω and d planes of qu while lamellae near s, x and m may also be repres This angle has typical characteristic values for diff optic axes maxima in two specimens; the optic maxima for grains with and without lamellae in specimen are mutually exclusive. Crystallographic tion of a lamella tested by another lamella or fra occurring in the same quartz grain show that the jority of the lamellae could be assigned to [11$\bar{2}$0] [10$\bar{1}$0] zones. The angle formed by two lamellae at optic axis in a quartz grain might be 0°, 30°, o when this is 0° the lamellae have a common dir in the basal plane, which might serve as a co glide line. The variations in the orientation of def tion lamellae with different optic axes pattern su that the pre-existing optic axes orientation and spatial orientation of the lamellae forming stres termine the angular distance of the resulting lam from the optic axis.

HAL P. DEMUTH (U.S. Coast and Geodetic Su Washington 25, D.C.) *Applications of the Telluro* This paper will discuss applications of the Tellur to specific projects in the U.S. Coast and Ge Survey. The project on Atka Island, Alaska w presented, as well as the present work in Virginia Maryland on the Federal Highway Program. So formation concerning the accuracy of the instr both on single-line measurements and traverse will be discussed.

ROBERT B. DEWEY (Department of Geology, versity of Chicago, Chicago 37, Ill.) *Traction a Velocity Discontinuities*—Experiments have been to examine a mechanism of producing traction interface because of surface waves in that int Results showed that the medium of lower wave ve moved toward the source of retrograde Rayleigh More complex wave systems in a brass plate ov by incompetent materials such as mixtures of san kaolin or finely ground talc produced a number systems and structures among which were low