2.3.6 SPECIFIC SOURCES OF EXTRATERRESTRIAL PARTICLES

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Sampling of magnetic particles in the 5 to 20 μm diameter size range on the earth's surface at different latitudes was used to detect meteor streams composed of particles of masses too small to be detected by other means. Magnetic spheroid concentration peaks appeared simultaneously at different latitudes in the Northern and Southern Hemispheres, proving that the majority of spheroids is of extra-terrestrial origin. Extraterrestrial particles consist of two major classes: (1) magnetic particles containing a high concentration of iron oxide in the form of magnetite; and (2) glassy particles containing a low concentration of iron and a large concentration of Si and Al; they contain Ni, Mn, Cr and Ti; the concentration of Ti is approximately one hundred times larger in glassy particles than in magnetic spheroids. Comparison of chemical composition of particles collected from different meteor streams must be very carefully evaluated; chemical composition of surfaces and interiors of magnetic particles is different due to selective fractionation of different chemical compounds between molten and solid phases and due to evaporation during entry of meteoritic particles into the atmosphere. The presence of H_2O, CO_2 and C_nH_{2n+2} in internal cavities of a few spheroids was found to be difficult to explain; those gases were associated with meteoritic particles and consequently they existed in space. The yearly earth flux of extraterrestrial particles can only be determined by the summation of daily fluxes obtained at different latitudes; the daily flux changes from year to year. Fluxes of particles present in January and October were calculated. Particles collected in January seem to originate from sources present between November 6 and January 15; during this period of time S. and N. Taurid, Geminid, Ursid and Quadrantid meteor streams are active. Particles collected in October seem to originate from the unknown meteor stream or from the Giacobini-Zinner meteor stream providing it is preceded by micrometeoritic particles approximately two weeks prior to the visual display.

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