V. S. Berezinskiĭ. *Superhigh-energy cosmic rays: The astrophysical aspect.* According to observational data,[1,2] two components are observed in the cosmic-ray spectrum at energies above $1\cdot 10^{17}$ eV: one, with energies below $1\cdot 10^{19}$ eV, is characterized by a steep energy spectrum [$\Phi(>E)\sim E^{-\gamma_1}$ with $\gamma_1\approx 2.0-2.1$], and another at energies above $1\cdot 10^{19}$ eV with a much more gently sloped spectrum [$\Phi(>E)\sim E^{-\gamma_2}$ with $\gamma_2\approx 1.3-1.5$]. The nature of the anisotropy also changes at the same energy: the average galactic latitude of the incoming particles begins to increase progressively with energy, thus demonstrating that the particles come for the most part from the north galactic hemisphere. This phenomenon points to an extragalactic origin for the particles with energies above $1\cdot 10^{19}$ eV; the flat component, which is expected in galactic models as a result of quasistraight-line propagation of the particles, should be characterized by preferential arrival of particles from the galactic disk.

At energies below $1\cdot 10^{19}$ eV, particles may be of either galactic[3] or metagalactic[4,5] origin. The galactic-origin model[3] requires the existence of a regular magnetic field in the halo of our galaxy and posits supernova outbursts (or young pulsars) as the cosmic-ray sources. The extragalactic origin at $E<1\cdot 10^{19}$ eV may result from generation of particles in quasars and Seyfert galaxies[4] or in the Virgo cluster,[5] which is situated almost at the center of the local galaxy supercluster. Only detailed experimental study of the anisotropy and chemical compositions will make it possible to distinguish between the galactic- and extragalactic-origin models at $E<1\cdot 10^{19}$ eV.

A characteristic feature of the flat component of the spectrum ($E>1\cdot 10^{19}$ eV) is the absence of the so-called black-body cutoff,[6] a sharp increase in the steepness of the spectrum at $E\sim 3\cdot 10^{19}$ eV due to the interaction of protons or nuclei of these energies with relic photons. The absence of the black-body cutoff is interpreted in all the proposed models as a consequence of particle generation in relatively nearby sources. Active nuclei of galaxies within the local supercluster are proposed as sources in Ref. 7, and generation of particles in the Virgo cluster in Ref. 5. The latter model encounters several difficulties.

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S. I. Nikol'skiĭ. *Absolute flux and nuclear composition of high-energy cosmic rays.* The accumulation of observational data on the primary high-energy cosmic radiation will go on for decades. Nevertheless, we may speak at this point of a certain stage in this process that calls for a retrospective and the most thorough possible comparison of existing experimental data with models of the origin and propagation of cosmic rays.

The range of cosmic-ray energies above 10^3 TeV is accessible only to indirect investigation through the extensive air showers. The methods used to study the showers, the basics of which, like the concept of the extensive air shower as a nuclear-cascade avalanche, were given more than 30 years ago by D. V. Skobel'tsyn and G. T. Zatsepin, make it possible to create installations with relatively small numbers of recording detectors with effective areas in the tens of km^2. The importance of this fact becomes clear when it is remembered that the intensity of the primary cosmic radiation with energies above 10^7 TeV is less than 1 km^{-2} yr^{-1} sr^{-1}.

The basic difficulty in using extensive air showers to determine the energy spectrum of the primary cosmic radiation arose out of the uncertainty as to the relation between the energy of the primary particle and the number of particles in the shower that it forms in the atmosphere. This uncertainty was tripled by ignorance of