On Mass-Ejection Sources in the Galactic Nucleus. Peter A. Wehinger, *The University of Michigan.*—Mass ejection from various stellar sources is considered as a possible explanation for the observed neutral hydrogen outflow from the galactic center. Although O- and B-type stars, M supergiants, T Tauri stars, and supernovae contribute to the enrichment of the interstellar medium in the spiral arms, they are not important in the central region of the Galaxy. Considerations are restricted to late-type dwarfs, M giants, planetary nebulae, and novae. Using available data for the galactic distribution of these objects and currently accepted mass-loss rates, their combined mass-ejection rate is 0.18 $M_{\odot}$/yr within 3.5 kpc from the galactic center. The major source of material is from the planetary nebulae, with an estimated ejection rate of 0.14 $M_{\odot}$/yr. The combined mass-ejection rate is still less than the rate derived from the 21-cm data, i.e., 1 $M_{\odot}$/yr. In conclusion, it appears that some other sources and/or mechanisms may be required to account for the total mass outflow.

An Upper Limit on the Abundance of Interstellar H_2 Formed by Chemical-Exchange Reactions. Donat G. Wentzel, *University of Maryland.*—Stecher and Williams (*Astrophys. J.* **146**, 88, 1966) derived the rate at which interstellar H_2 is formed on graphite grains by chemical-exchange reactions. The reactions require an activation energy of 0.18 eV. For H I regions one must, therefore, invoke cloud collisions. If the gas in a colliding cloud remains at a temperature $T \gtrsim 10^{3}$°K for a time τ, then the ratio of molecules to neutral atoms f increases by roughly $\Delta f = \tau/(10^6 \text{ yr})$ during this collision. Since the molecules are collisionally excited and radiate efficiently, the needed temperature lasts only on the order of $\tau = 10^2/f$ yr. Therefore, one cloud collision yields $f\Delta f \simeq 10^{-4}$. Even if the cloud initially contains no molecules at all, the 1% H_2 that is formed during the first 10^4 yr after the gas is heated cools the gas in the next 10^4 yr so that no more H_2 is formed. An initial abundance of H_2 or other cooling agents further decreases the production of new H_2. Some additional chemical-exchange reactions on fast grains may yield $\Delta f \gtrsim 0.4\rho$ (grain/ρ atoms). Since all molecules are destroyed near hot stars in intervals of roughly 10^8 yr, the interstellar medium contains *less than* 10% H_2 molecules formed by chemical-exchange reactions. This limit is independent of the value of the interstellar magnetic field.

Physical Categories of the Moon's Nocturnal Hotspots. Robert L. Wildey, *Center of Astrogeology of the U. S. Geological Survey.*—A map of the thermal surface brightness of lunar regions darkward of the sunset terminator, together with a positional chart of a large number of nighttime hotspots, has recently been provided through telescopic reconnaissance in the 8–14 μ region (Wildey, Murray, and Westphal, *J. Geophys. Res.* **72**, 1967, to be published). Nine additional thermal anomalies have been added to this collection for a thermodynamic analysis and for a morphological analysis of the signal properties of these anomalies. Information extraction has been carried to the limit allowed by system noise. Attempts to regain the cooling curves of anomalies provide suggestive information that the anomalies are not all volcanic, a fact previously suspected but never observed directly. In addition it may be concluded that two categories of anomalies are present on the moon's dark side, not including "false" anomalies of the "delayed sunset" type in which a feature of large positive topographic expression experiences an effective terminator passage later than its surrounding terrain.

One category contains anomalies which are faint in intensity but range to great breadth. The other category exhibits hotspots of wide intensity range all of which are quite small. It seems simplest to explain them as partly magmatic heat sources and partly regions of more consolidated rock, or perhaps conductivity anomalies, part of which arise from the exposure and fusion resulting from impact and the balance of which arise from magma which has solidified too recently to have reached the steady state surface conductivity which is produced by cosmic agents of erosion and sedimentation.

It is noted that Lunar Orbiter photography has shown that the eclipse anomalies tend to be boulder fields, which agrees with our previous predictions. The present observations predict that something quite different will be found in (e.g.,) Mare Crisium by the high inclination Lunar Orbiters.

Photospheric Abundance of Iron. George L. Withbroe, *Harvard College Observatory.*—The center-limb variation of the equivalent widths of 198 Fe I lines in the spectral region 5500 to 7000 Å have been studied with four photospheric models. The *gf* values of Corliss and Warner (*Astrophys. J. Suppl.* **8**, 395, 1964) were used in the analysis. The photospheric abundance of iron was determined as a function of limb position and as a function of excitation potential X_{ex} of the lines. The abundance does not vary significantly with position on the solar disk; however, it does seem to depend upon excitation potential. The iron abundance decreases with increasing excitation potential for $1 \lesssim X_{ex} \lesssim 4$ V and increases for $4 \lesssim X_{ex} \lesssim 5$ V. The minimum in