The following instrumental set up is a possible solution: Let a 20" diaphragm, at the focal plane of a large telescope, be bisected by a highly polished razor. Let a 45° mirror on one side reflect the light into a photomultiplier and let the light on the other side go into a light trap. Any departure from a constant signal as the position angle of the multiplier is varied would be due to either a planetary companion or a distant star. A repetition of the experiment several months later should decide this question.

Other stars from which a member of our solar system would be at least as bright as 25^m0 and as far as 0".75 from the primary include: β Hyi, Sirius, Procyon, Altair, Fomalhaut, Vega, β Gem, and Arcturus.

A telescope on an artificial earth satellite can probably not provide either the size of instrument or the necessary guidance accuracy for the long periods of observing time required for this experiment but an observatory on the moon would be ideally situated.

*Office of Space Sciences
National Aeronautics and Space Administration
Washington, D. C.*

Sandage, Allan and Wallerstein, George. *The color-magnitude diagram of the nuclear globular cluster NGC 6356 compared with halo clusters.*

NGC 6356 is representative of a group of globular clusters located in the vicinity of the galactic center which have strong spectral lines. A color-magnitude diagram of the cluster has been determined to $V = 19.4$ and $B = 20.3$ from plates and a photoelectric sequence obtained at the 200-inch telescope.

The diagram shows a strong giant branch extending from $V = 15.3$, $B - V = 2.2$ to $V = 17.5$, $B - V = 1.2$; but the slope of this giant branch is considerably less than that of a normal globular cluster. There appears to be a short horizontal branch and a poorly defined sub-giant branch. The horizontal branch extends to $B - V = 0.8$; but no bluer stars are present. The magnitude difference between the horizontal branch and the giant branch is only 2.4 mag. as compared with the usual value of about 3 mag.

From colors and spectra of foreground B and A stars the reddening is at least $E_{B-V} = 0.5$ and may be greater. The reddening estimate is uncertain because there are no RR Lyrae stars in the cluster.

Comparison of the color-magnitude diagram of NGC 6356 with other clusters has been made

by fitting the horizontal branches. This comparison shows that the giant branch of NGC 6356 is fainter than the giant branches of typical globular clusters such as M13 and M92, but is brighter than the giant branch of the old galactic cluster M67. Thus NGC 6356 is intermediate between M13 (which shows a metal deficiency of a factor of about 20) and M67 whose stars seem to have normal metallic lines.

This result, combined with the number of stars on the giant branch, is consistent with Morgan's description of the spectrum as being giant K with CN present in absorption.

*Mt. Wilson and Palomar Observatories
Pasadena, California and
University of California
Berkeley, California*

Searle, Leonard. *A spectrophotometric study of R Coronae Borealis.*

High-dispersion spectra of the hydrogen-poor, carbon-rich supergiant variable R Coronae Borealis, obtained at maximum light, have been quantitatively compared with similar spectra of the standard supergiant δ Canis Majoris. The equivalent widths of 200 unblended lines in the wave length region $\lambda\lambda 4000$ –4700 have been measured and a curve of growth abundance comparison carried through.

The carbon to iron ratio is found to be 25 times greater in R CrB than in δ CMa. The carbon to hydrogen ratio in R CrB is found to be about 40. Lines of nitrogen and oxygen do not fall in the region studied. Among the metals there is no clear evidence for abundance anomalies exceeding a factor of two. In particular the abundance of the rare-earth elements relative to iron is the same in R CrB and the standard star.

Quantitative agreement between predicted and measured equivalent widths of the carbon lines is obtained with the hypothesis that the predominant opacity source in R CrB is the photoionization of neutral carbon.

Precise measures of the blended molecular bands in R CrB are not possible, but rough intensity estimates give reason for believing that the ratio of carbon to nitrogen must be greater in R CrB than in stars of solar composition.

If it is true that the composition of the atmospheric material of R CrB differs from solar composition only in the abundances of carbon, hydrogen and helium then the composition parameters of R CrB are $X = 0.00014$, $Y = 0.92$, $Z_e = 0.07$. If on the other hand nitrogen and