Adaptation, become sensitive to one thousandth of this level. While the
threshold of sensitivity becomes about 6.3 X 10⁻⁴, when the
light level is changed, the adjustment of the human visual system
is made quickly. Sensitivity decreases with age to about 50% for
each 10 years. Secondary inputs to the brain. One is from the eyes, the
other from the skin or the ears.

The so-called OPTIC NERVE, really an extension of the brain, is
to the rear wall of the eye globe (or the retina) in a camera. The
sensation of VISION is the combined result of two
inputs to the brain. One is from the eyes, the other from the
brain itself (memory). Although very difficult to separate, the different
natures of these two inputs must be recognized for intelligent observ­
ing.

The RETINA comprises elements sensitive to wavelength, or COLOR,
called CONES, and elements sensitive to intensity only, called 
RODS. The MACULA, the central area of greatest acuity, is covered
by cones. In order to perceive that two closely spaced points are separ­
ate, at least one unstimulated cone must lie between the two images
on the retina. The rods are distributed on the periphery of the retina.

DARK ADAPTATION of the cones takes place in about eight minutes,
when the threshold of sensitivity becomes about 6.3 X 10⁻⁴, but the rods,
which are more sensitive to low light, require about a half-hour for
adaptation. The cones are sensitive to objects of lower brightness if larger or moving.

Sometimes a most sensitive spot may be found, perhaps ten degrees
from the macula, either above, below, or to one side.

FLICKER and MOTION are far more easily perceived in the peripheral
region, but with poor acuity and color sensitivity. The eye is sensitive
to objects of lower brightness if larger or moving.

Sensitivities of the retina are reduced by SMOKING or PHYSICAL FATIGUE.
ALCOHOL decreases sensitivity of both the eye and brain cells. CAFFEINE
does not increase sensitivity, but may stimulate the brain. Supplemental
VITAMIN A helps only if there is a deficiency then only after about six
months of treatment.

HEYDEN TO TALK TO NCA ON MILKY WAY STAR COUNT

Francis J. Heyden, S. J., Director
of the Georgetown University
Observatory, will speak to the NCA on
January 25th on "COUNTING THE
MILKY WAY.

He will discuss some of the
fundamentals of statistical astron­
omy, a branch of research somewhat
neglected in the literature. In his
four-part talk, Father Heyden will
cover basic theory, appraisal of re­

nudges new techniques for counting,
and the use and contribution of data
gathered by the new techniques.

Father Heyden will describe a
technique now being developed by one
of his graduate students. This is a
device which, by scanning, recognizes
sizes and shapes of images on star
plates, yielding separate counts of stars and galaxies according to magn­
itude. Visual counting has been one
of the most laborious tasks undertaken
by the astronomer.

Father Heyden has spoken to the NCA on previous occasions and his
work is well known to the NCA. For several years he was on the staff of the
Manille Observatory. He received his Ph. D. in astronomy from Harvard
during the Second World War. Among the activities for which he is
best known are the eclipse expeditions which he has led and his work
in photographing the Southern Milky Way.

At Georgetown he has been
developing new methods of timing solar eclipses. He is also working
with the Air Force on astronomic research.

MORE SATELLITE OBSERVATIONS

Moonwatch teams in the Washington area succeeded in obtaining
a series of observations of O11 before it came to earth. It crossed
the meridian at E. P. G. at an altitude of 65° (6:02 P.M.) November 24th,
and was watched until it reached an altitude of 40° in the southeast.
This passage occurred one day sooner than Cambridge had predicted. On
the next day the orbit had moved so much that at 5:17 P.M., O11 crossed
at an altitude of 40°. The December issue of STAR DUST reported observations of
O11 and O2 on these days, and some on the 26th, when O11 was seen very low
in the southwest at 5:25 P.M. Considering the low elevation of the
rocket and the long period from sunset it is surprising that the shadow
of the earth did not interfere.

Moonwatch teams started looking for O in the morning sky about the
10th of December. On the 12th the temperature at E. P. G. was eight
degrees below normal, and moonlight was reflected from the telescope mirrors, making
last-minute adjustments difficult. The rocket, however, it was not observed that
morning. It was seen, however, by Lyle Johnson and Steve Nagy, of
E. R. D. L., who said that it crossed by the Zenith at 5:57 A. M. Beta
crossed by the telescope at 5:27 A. M. on the 12th, and very close for light,
about 20°, and for the last eight minutes, it's brightness fluctuating periodically.
This is the first case when the apparent motion of the orbit has been to the
northwest.
MORE SATELLITE OBSERVATIONS (Cont’d. from page 1)

On the 15th, Alan Bradford observed a transit of the moon. He followed
bybinoculars the satellite passage near the top edge of the moon.
The time was 5:00 A.M., and the moon’s position was right ascension
18° 16', declination -4° 59'.

Other observations were made on the 15th and 16th, and more are
during December.

A. L. White, Astronomy Editor

JANUARY CALENDAR

JANUARY 4 (Saturday) - Lecture Series: "STAR COUNTS IN THE MILKY WAY"
Francis J. Heyden, S. J., 8125 P. M., Dept. of Commerce Auditorium,
15th and E Streets, N. W. The public is welcome.

JANUARY 11 (Saturday) - Maryland and D. C. Juniors over 12 meet with
Leith Holloway at 2:00 P. M. at the Chevy Chase Community Center,
5001 Connecticut Avenue, N.W. Discussion Topic: "Relativity." Call
Leith at 61-8933 for details.

JANUARY 13 (Sunday) - Discussion Group: "Celestial Photography," led
by Everett Neville, 8:00 P. M. in the Foyer of the Commerce Auditorium.

JANUARY 19 (Sunday) - Group Observing at the NCA 6" Refractor, starting
at 7:30 P. M., followed by IGY group meteor observation. The group
will be organized and instructed by Mr. Isherwood, and will use the
standard IGY report form. Regular observers are desired for meteor
showers and IGY world days. Your NCA membership card will admit you
to the Observatory grounds.

CONTINUING ACTIVITIES

EACH MONDAY NIGHT, the telescope making class meets with Hoy Walls at
7:30 P. M. at the Chevy Chase Community Center.

EACH WEDNESDAY NIGHT (except January 1), the Virginia Juniors over 12
meet with Bob Brown at Falls Church High School for discussions of
astronomy, optics, and telescope making, at 7:30 P. M.

At their December 18 meeting, Bob's group previewed the program
for the coming year with enthusiasm. Slides were also enjoyed.

NCA GROWS

The NCA cordially welcomes the following people, who were elected
to membership December 7, 1957:

REGULAR
Mr. and Mrs. Donald G. Boegehold, 1104 So. Cleveland,
Arlington, Va. 7-3792
Hugh M. Fitzpatrick, 4605 Montgomery Ave., Glen Cove 16, L.I.
Joseph W. Kappel, 12315 Bluhill Rd., Silver Spring, Md. 2-0970
Paul Rininger, 10420 Hayes Ave., Silver Spring, Md. 6-6095

JUNIOR
Robert W. Milkey, 5523 Lincoln St., Bethesda, Md. 6-23179

Four million tons of solar mass is converted to energy each second.

OBSERVATIONAL DATA FOR JANUARY

MERCURY is a morning star in January and reaches greatest western
elongation on the 15th. Venus is visible in the southwest after sunset
until January 26, when it is in conjunction with the sun. MARS is in
Scorpio and may be seen in the southwest for several hours before sun-
rise. JUPITER is in Virgo, and rises an hour after midnight. SATURN
is in Ophiuchus, and rises in the southeast two hours before the sun.

The date of maximum intensity for the QUADRANTID meteor shower is
January 3. This shower averages 20 meteors per hour, and the position
of the radiant is 06° 23' S, 8° 56'.

On the 15th at 2300 (E. S. T.), the milky way spans the heavens from
north to south, passing through Cassiopeia, Perseus, Auriga, and Monoceri.

Lunar Occultations for January

The 1956 editions of the GRAPHIC TIMETABLE OF THE HEAVENS and the
Canadian OBSERVER'S HANDBOOK are now available, and may be procured
from the Treasurer at the January meeting.

Satellite 1957 is expected to be next seen here late in January.

MORE TO THE EYE THAN MEETS IT; DR. BYRNES POINTS OUT

Dr. Victor A. Byrnes, Aviation ophthalmologist, Brigadier General,
and Director of Professional Services for the Surgeon General of the
Air Force, provided a unique educational treat for the NCA in his talk
on the eye in December. Clearly illustrated by color slides, his presen-
tation included so much important information that it was decided to
list briefly for reference as many points as could be covered here.

The LENS of the eye, unique in that it is focused by changing its
curvature rather than its position, has a focal length of about 17 mm.,
corresponding to 88 diopters. The ability to focus at close range, or
ACCOMMODATION, decreases with age. Mechanism may be severely FATIGUED
by focusing telescope to require too great an accommodation. Looking
into an empty field, the eye focuses at about one meter, not infinity.
This condition, NIGHT MOPIA, can cause Air Force pilots to fail to see
distant planes, or astronomers to miss satellites. Whenever possible,
have stars or other objects in field at proper distance. A single point
source in the field may seem to move about. This AUTO KINETIC phenomena
may also be prevented by having other objects in the field. Moving the
eyes occasionally also helps.

Under certain conditions, the LENS FIBRONS can act as a DIFFRACTION
GRATING. TEARS on CORnea can also be troublesome. (Move lids occasion-
(continued)