



◊ \* ○ ● SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

about 100,000,000,000 stars and then the ratio would drop to one. That is, a further increase to reveal stars of magnitude 30 would not show any more. Then we would have reached the end of our stellar system.

Not only do such counts tell us that the stars are confined to a limited system—they can also tell us its shape. Among the naked-eye stars there are about four times as many in a given area toward the Milky Way as in other directions. For stars of the 20th magnitude they are about 44 times as numerous, so this indicates that in the direction of the Milky Way we could go much farther before coming to the end. The whole system, which we call the Galaxy, thus has the shape of a vast grindstone, of such a diameter that light, traveling 186,000 miles a second, takes about 100,000 years to cross it. We are out quite a distance from the center, toward the constellation of Sagittarius, which we now see in the south, and that is why the Milky Way is so bright in that direction.

**Millions of Galaxies**

But although these stars of our own system are limited, there are millions of other such systems—other galaxies—out beyond the borders of ours. One of the nearest can be seen with the naked eye as a hazy spot of light in the constellation of Andromeda. The light from this takes about 700,000 years to reach us. With the 100-inch telescope at the Mt. Wilson Observatory, still the world's largest, galaxies have been detected which are so distant that their light spends about 500,000,000 years on its way to us. The 200-inch instrument, nearing completion on Mt. Palomar, will reach out about twice as far, and it is in the observation of these distant ob-

jects that this new astronomical eye will find one of its most important tasks.

**Celestial Time Table for August**

Aug. EST	
2 10:00 a.m.	Mercury in line with sun
7:53 p.m.	Moon passes Jupiter
4 3:55 p.m.	Moon in first quarter
6 7:00 p.m.	Moon farthest, distance 251,300 miles
9 9:00 a.m.	Venus passes Mars
12 Early a.m.	Meteors of Perseid shower visible
5:26 p.m.	Full moon
19 8:17 p.m.	Moon in last quarter
20 3:00 p.m.	Mercury farthest west of sun
22 5:00 a.m.	Moon nearest, distance 229,000 miles
24 10:59 a.m.	Moon passes Saturn
25 5:44 a.m.	Moon passes Mercury
26 4:07 p.m.	New moon
29 12:38 p.m.	Moon passes Mars
30 5:35 a.m.	Moon passes Venus
1:06 p.m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three for PST. Add one hour for the corresponding Daylight Saving time.

*Science News Letter, July 27, 1946*

**SURGERY**

**Surgery Aids Cancer Of Prostate Gland**

➤ CHANCES OF one kind of cancer patients surviving five years, the customary period for appraising results of cancer treatment, have been increased from 14.1% to 20%, it appears from a report of Dr. Charles Huggins of the University of Chicago (*Journal of the American Medical Association*, June 15).

The patients Dr. Huggins reported were all elderly men with cancer of the prostate gland. The treatment was surgical removal of the sex glands.

Of the 21 patients operated on five years ago, one died of pneumonia within eight days of the operation. One is alive but has a slowly advancing prostatic cancer. Four, including one man who was 71 years old and dying at the time of operation, are now alive and well with no clinical or laboratory evidence of cancer.

Reports quoted by Dr. Huggins of other methods of treating this kind of

cancer show that the highest five-year survival rate was 14.1%, with some as low as 1.3%.

In spite of general acceptance of five years without recurrence as a cure for cancer, Dr. Huggins states that it is premature to suggest that any of his patients has been cured.

The effectiveness of the operation is apparently dependent on whether the cancer is dependent on male sex hormones and whether the sex glands are contributing functionally significant amounts of the total production of these.

The 15 patients who did not survive the five-year period lived from three and one-half to 63 months after the operation.

Among the five-year survivors, signs of spread of the cancer to the bones are either absent or equivocal, although all had signs of bone cancer at the time of the operation.

*Science News Letter, July 27, 1946*

**PHOTOGRAPHY**

**Timing Devices Make X-ray Photography Safe**

➤ X-RAY PHOTOGRAPHY has had its guess-work removed by two timing devices on which U. S. patents have just been issued to a pair of Chicago inventors, Russell H. Morgan and Paul C. Hodges.

The first device consists of a photocell with suitable electrical hookup to swing a pointer over a graduated scale. A trial "shot" of X-rays is sent through the subject onto the photocell; their remaining intensity determines the amount of current and hence the swing of the pointer. The scale is graduated directly in seconds needed for proper exposure of the film.

The second device improves on the first, in that a preliminary "shot" is not necessary. The photocell receives the X-rays after they have passed through both the subject and the photographic film. Current from the photocell, instead of moving a pointer, builds up a charge on a condenser. When it reaches a predetermined level it acts through a thyatron-controlled relay to break the X-ray circuit and end the exposure. The whole operation is automatic; the roentgenologist does not even need to know what the proper exposure time is.

Rights in both patents, Nos. 2,401,228 and 2,401,229, are assigned to the United States of America, as represented by the Director of the Office of Scientific Research and Development.

*Science News Letter, July 27, 1946*

