

of the sun, remaining in the sky for the longest time after sunset. On Oct. 8 it will be at greatest brilliance, with magnitude minus 4.3, which is about 15 times as bright as Sirius. Then it will quickly disappear, reaching inferior conjunction Nov. 12, but it will quickly reappear in the morning sky, as bright as it was before the conjunction.

Mars, Jupiter and Saturn move in orbits larger than the earth's, so they can never come to inferior conjunction. They are most conspicuous at opposition, when they are in the opposite direction from the sun. Mars was out beyond the sun, in conjunction with it, on Dec. 14. Now it is gradually coming into view in the morning sky, but not until spring will it be at all prominent. By the end of the year it will be conspicuous in the evening, with opposition on Feb. 4, 1963.

Jupiter is now out beyond the sun, with conjunction Feb. 8. By late spring it will move into the evening sky, opposition arriving Aug. 31. Saturn will be at conjunction on Jan. 22, with opposition July 31.

Thus, by next fall we will have a fine display of planets, with Venus, Mars, Jupiter and Saturn all visible.

The new year will also bring two eclipses of the sun. The first, on Feb. 4 and 5, is total. Along a belt crossing the Pacific Ocean, from New Guinea to a point about a thousand miles west of Lower California, the sun will be completely covered by the moon for as long as four minutes. Over a larger area, including the west coast of North America, a partial eclipse will be seen.

On July 31 there will be an annular eclipse. That is, the moon will come in front of the sun but will not cover it. A ring of the solar surface appears around the dark disc of the moon. This effect will be visible along a path from Brazil, crossing the South Atlantic, then traversing Africa and Madagascar. All of Africa, most of South America and Florida and Georgia in the U.S., will see a partial eclipse.

Celestial Time Table for January

January	EST	
2	7:04 p.m.	Algol at minimum
6	7:36 a.m.	New moon
7	8:00 a.m.	Moon passes Mercury and Saturn
8	3:00 a.m.	Moon passes Jupiter
	9:00 a.m.	Moon nearest; distance 225,400 miles
13	12:02 a.m.	Moon at first quarter
14	6:21 a.m.	Algol at minimum
17	3:11 a.m.	Algol at minimum
20	1:17 p.m.	Full moon
	7:00 p.m.	Mercury farthest east of sun
	midnight	Algol at minimum
22	1:00 p.m.	Saturn in conjunction with sun
	8:50 p.m.	Algol at minimum
24	8:00 a.m.	Moon farthest; distance 252,100 miles
25	5:39 p.m.	Algol at minimum
27	5:00 a.m.	Venus at superior conjunction with sun
28	6:37 p.m.	Moon in last quarter

Subtract one hour for CST, two hours for MST, and three hours for PST.

Know the Sky to Watch Satellites

These star maps showing the positions of stars and planets can help you locate

satellites when they flash briefly across the sky. Familiarity with the constellations and their relative positions makes locating artificial moons much easier whenever they are visible from your area.

• Science News Letter, 80:418 December 23, 1961

MEDICINE

Mice Protected Against Cancer With TB Germs

► UNIVERSITY of California scientists have protected mice against five experimental cancers by injecting them with living and killed tuberculosis germs.

In various experiments, the bacterial preparations proved from 10% to 90% effective against later inoculations with the cancers. All the cancers used had originated recently and spontaneously in the strains of the animals tested.

Such cancers bear a closer resemblance to the development of clinical malignancies in man than to the growth of old, established laboratory lines of malignant cells, or of tumors produced artificially in animals by means of chemical agents.

These experiments were described in a report by Drs. David W. Weiss and Kenneth DeOme and Mrs. Rose Bonhag, of the Department of Bacteriology and the Cancer Research Genetics Laboratory.

The results of the research indicate that a single non-toxic agent can have at least some protective effect against several cancers of a different type, in animals which are the natural hosts of the cancers. Heretofore, it has been generally found that effective anti-tumor agents are either considerably toxic, or are rather limited to a particular type of tumor.

Various forms of extracts of tubercle bacilli were tested against cancers of mouse uterine connective tissue, liver and bone, and two types of breast cancer.

The various preparations were composed of living tuberculosis germs, germs killed with phenol, and killed germs extracted with acetone and other chemical solvents yielding various fractions.

All the preparations elicited some protection, but the degree of protection varied from tumor to tumor.

Dosage turned out to be a critical factor—too much or too little of any of the preparations brought poor protection. Small doses usually were best. The dead germs were as effective as living bacilli, and sometimes more so.

Tuberculosis germs mixed with other substances or given beforehand have long been known to improve the ability of many animals to respond subsequently to unrelated antigenic materials. They have also been found to raise considerably an animal's resistance to subsequent infection with other disease-causing germs. The mechanism of the resistance produced by tubercle bacilli against the cancers is not yet understood, but there is some suggestion that it might involve a similar stimulation of the immunological abilities of the animals.

The results point to the high possibility of some degree of cancer prevention if, as some contend, cancerous cells act as antigens for the animals in which they arise.

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