

will be visible starts in the South Pacific Ocean, crosses the southern tip of South America, the South Atlantic Ocean, South Africa, Madagascar, and ends in the Indian Ocean. Over a larger area, including Antarctica, and the southern parts of South America and Africa, there will be a partial eclipse of the sun.

But 1963 will bring two eclipses visible in the United States and Canada. First is a total eclipse of the sun on July 20. This time the relative distances of the sun and moon will be such that the moon will completely hide the sun. To see this happen you will have to be along the "path of totality"—the band the earth's shadow sweeps out. From its start in Japan at sunrise, this path crosses the North Pacific, Alaska, Yukon, the Northwest Territories, Northern Saskatchewan, Manitoba, Ontario, Quebec, Maine, just misses the southern tip of Nova Scotia, and ends at sunset in the Atlantic.

This eclipse is visible as a partial one from Central America and the very northern tip of South America.

On the night of December 30, there will be a total eclipse of the moon, visible generally throughout North America, as well as other parts of the world.

This monthly article will deal with each of these eclipses as the time for them approaches.

## Celestial Time Table for January

Jan.	EST	
1	10:54 pm	Algol (variable star in Perseus) at minimum brightness
2	8:02 pm	Moon in first quarter
4		Earth nearest sun, distance 91,343,000 miles
	3:00 am	Moon nearest earth, distance 229,800 miles
		Mercury farthest east of Sun
	7:43 pm	Algol at minimum
9	6:09 pm	Full moon, penumbral eclipse
12	10:00 am	Moon passes Mars
17	3:00 am	Moon farthest, distance 251,300 miles
	3:35 pm	Moon in last quarter
19	3:50 am	Algol at minimum
20	6:00 am	Mercury between Earth and Sun
21	1:00 pm	Moon passes Venus
22	12:40 am	Algol at minimum
	10:00 pm	Venus farthest west of Sun
24	9:29 pm	Algol at minimum
25	8:42 am	New Moon, annular eclipse visible in Southern Hemisphere
27	6:18 pm	Algol at minimum
28	2:00 am	Moon passes Jupiter
29	2:00 am	Moon nearest, distance 228,500 miles

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

• Science News Letter, 82:420 December 29, 1962

## VETERINARY MEDICINE

# TB Diagnosis in Cattle

➤ A MORE accurate and faster procedure for diagnosing tuberculosis in cattle is under development at the Michigan State University microbiology department, under the direction of Dr. Walter L. Mallman, professor of microbiology, and George Leonard Wright, graduate research assistant.

A more exacting and precise diagnostic procedure will open new aspects in the diagnosis of bovine tuberculosis and the prognosis of human TB.

Successful development of the process would enable the diagnostician, in many cases, to tell whether the disease detected is actually tuberculosis or another disease closely resembling TB. This will bear on whether or not the cattle need to be destroyed.

Michigan State University and the U.S. Department of Agriculture research is aimed at isolating certain atypical mycobacterial organisms that resemble tuberculosis bacteria and which have been isolated from man and cattle in large numbers causing great concern in recent years, since they are highly resistant to treatment.

Blood serum of experimentally infected cattle will be examined to determine the total protein content.

"This serum will then be placed on cellulose acetate strips and placed in an electrophoretic chamber. An electric current will separate the various protein fractions contained in the serum. These produce a characteristic pattern somewhat resembling a series of curves and blotches to the untrained eye. The strip is next placed in an automatic scanner which will measure the

density of the protein fractions in graph form."

Mr. Wright hopes eventually to be able to identify a particular disease by comparing the results of a test or graph with a pattern from a known disease obtained by the same method. A field technician could collect sera samples from suspected animals in the herd and compare the results with already known patterns, indicating whether the disease is tuberculosis or a non-tuberculosis disease.

There already exist methods of detecting human TB, but none that enable a doctor to quickly and easily follow the course of the disease in a patient. If this experimental technique can be perfected in cattle first of all, the procedure may be applicable to the prognosis of human tuberculosis.

This technique might be used to follow tuberculosis as it invades the human body. In previous research using the electrophoretic technique, there were definite variations in one or more of the protein fractions in the serum.

By applying this new technique, a series of blood samples might be taken from a patient. The resulting serum from each sample would then be placed in the electrophoretic chamber and the results compared with a known pattern. This method should tell the doctor how the patient is progressing in his personal fight against TB.

The research is sponsored by Christmas Seal funds granted by the Oakland County Tuberculosis Association and the Michigan Tuberculosis and Respiratory Disease Association.

• Science News Letter, 82:421 December 29, 1962

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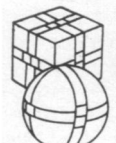
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