



but gradually more and more circles had to be introduced as new facts were learned about the planetary motions, and the system became most unwieldy.

In 1543 everything was simplified by the publication of the masterpiece of the Polish astronomer, Nicolaus Copernicus, a book generally known as "De Revolutionibus." This revived a suggestion made centuries before by Aristarchus, a Greek astronomer, that the sun is the center and the earth just one of the planets, revolving around it. Despite opposition, this theory prevailed, and now we know why part of this month Mars seems to move to the east, and during the rest of the month to the west.

We are observing it from a moving platform, for the earth moves around the sun at a speed of 18.5 miles per second. Farther out, Mars' speed is 15.1 miles per second. Thus, every time we are on the same side of the sun as Mars, we overtake it at a relative speed of 3.4 miles per second, and while we are doing this the planet seems to go the other way, to

"retrograde," as the astronomer says. In other words, the effect is similar to that observed by a person traveling along on an express train, and overtaking a slower freight train on the next track. Under such conditions, the freight may seem to be going backwards.

#### Celestial Time Table for June

**Thursday, June 1,** 10:11 p. m., full moon. **Tuesday, June 6,** 7:58 a. m., moon passes Mars, 17 lunar diameters to north. **Wednesday, June 7,** 4:00 a. m., Mercury on opposite side of sun; 6:00 p. m., moon farthest from earth—251,400 miles away. **Friday, June 9,** 11:07 p. m., moon in last quarter. **Sunday, June 11,** 11:45 a. m., moon passes Jupiter, 8.5 lunar diameters north. **Tuesday, June 13,** 6:34 a. m., moon passes Saturn, 6.5 lunar diameters north. **Saturday, June 17,** 8:37 a. m., new moon. **Monday, June 19,** 3:00 p. m., moon nearest earth, 225,800 miles away. **Thursday, June 22,** 2:40 a. m., sun farthest north—summer commences. **Friday, June 23,** 11:35 p. m., moon in first quarter. **Saturday, June 24,** 3:00 a. m., Mars stationary, after this moves to west instead of east.

*Science News Letter, May 27, 1939*

#### MEDICINE

## Mystery of Leprosy And Tuberculosis

ONE of the unsolved questions in medicine and public health concerns the remarkable decline in leprosy in civilized countries since the Middle Ages. This horror of Biblical times still afflicts about 3,000,000 persons in various parts of the world. But in civilized countries it is so rare a disease as to be a medical curiosity. In the United States, for example, only about 30 deaths from leprosy are recorded each year out of an annual total of nearly 1,500,000 deaths.

Scientists would like to know exactly what has caused this decline in leprosy because, as public health experts of the Metropolitan Life Insurance Company point out, the answer might throw light on current medical problems, chiefly that of tuberculosis. This disease also seems on its way out, but if scientists knew just what happened to leprosy, they might be able to hasten further the elimination of tuberculosis, it is suggested.

The two diseases have many points in

common. Both are caused by germs belonging to the class of so-called acid-fast organisms. These germs seem to owe some of their properties to the fact that they have an outer coating of a waxy substance. Extensive modern chemical studies of the tuberculosis germ are throwing light on the properties of both this outer waxy coating and other parts of the tb germ.

Other resemblances between leprosy and tuberculosis are their moderate degree of infectiousness and the prolonged incubation period which makes it almost impossible to trace the source of the infection. Both diseases are very refractory to treatment and both tend to run a prolonged course. For both ailments institutional treatment with some degree of segregation is advisable, both to reduce the chances of spread and because this form of treatment is best for the patient.

Hereditary predisposition seems to play a part in determining the victims of both diseases.

*Science News Letter, May 27, 1939*

#### ETHNOLOGY

### Assyrians Know Customs Of Shepherd's Psalm

PROBABLY no Bible passage is so frequently explained as the Twenty-Third Psalm. And still the Western World has difficulty in realizing how completely the pictures of shepherd life suggest the fullness of living to the Near East.

A new small book by an Assyrian, who was a chief shepherd's son and who grew up to become an Episcopal theologian, presents the Assyrian ethnology—to view it from a scientific angle—of the well-known passage.

Nearly every one in Arabia, Palestine, and Mesopotamia knows something about sheep, because the desert people depend on sheep for a livelihood, explains Dr. George M. Lamsa, in *The Good Shepherd: The Twenty-Third Psalm*. (A. J. Holman Co.) But good shepherds are rare, and some become so famous that they are set up as examples to be emulated.

Sheep raising has been considered the highest occupation in that part of the world throughout the centuries, he continues. Experienced shepherds act as judges, arbitrators, instructors of young shepherds, musicians, legislators, and healers. Like statesmen, they make oral treaties with surrounding tribes.

"Indeed," says Dr. Lamsa, "a shep-

herd in a sheep camp is like a captain on an ocean liner. He is the sole ruler of the people and their flocks, and his word is law."

It was not so strange that ancient prophets and kings were called to leadership from tending sheep.

The feasting and brimming cup described in the psalm are typical of hospitality among Eastern nomads, says the Assyrian. Food for guests or strangers must be piled high and the dishes running over, lest they fear there is too little, and refuse to eat. Easterners even borrow from a neighbor to set forth a laden table for guests. And when an enemy comes to see if rumors of poverty are true—as is sometimes done—the hasty arrangement of a lavish meal wins admiration from the gossipy guest. He will at least leave pitying and admiring the family that keeps up its traditions of generosity in a hard time.

*Science News Letter, May 27, 1939*

## From Page 323

than those used to produce the cancers in the rats. The development of cancer under the influence of this hormone, he added, all depends on conditions existing in the breast before the influence of the hormone is brought onto the scene.

Another female sex hormone can probably be used in a chemical test for distinguishing between breast cancer and another disease of the breasts, chronic cystic mastitis. The amount of this hormone, as measured by its excretion product, pregnandiol, is reduced in the cystic condition, Dr. Geschickter said.

A weapon against one form of heart disease, bacterial endocarditis, has been forged by two St. Louis physicians, Drs. Ralph Kinsella and R. O. Muether. By discovering a way to produce and cure the disease in animals, these doctors have presented medical science with a possible means of curing the ailment in man and with a means for further research for a cure if necessary.

Germs play a part in this heart ailment, which is a diseased condition of the heart valves. The disease can be produced in dogs exactly as it appears in man, the doctors found, by a mechanical injury to a heart valve followed by injection into a vein of germs of the streptococcus family. When induced in this way, the condition was invariably fatal.

Treatment with a chemical remedy, known by the trade name of merthiolate, saved half of a group of 24 animals. Sulfanilamide also proved an effective remedy against the ailment in dogs, but

its action was not as prompt as that of the other chemical.

*Science News Letter, May 27, 1939*

## Artificial Heart

**A**N ARTIFICIAL lung and heart device with real life-saving possibilities made its debut before the American Medical Association meeting.

The mechanical steel cylinder and pumps of the apparatus have already doubled successfully for the living lungs and beating heart of a cat, keeping the animal alive for eighteen minutes while its own breathing apparatus was put temporarily out of commission by a surgical clamp which closed the artery supplying blood to the animal's lungs.

An attempt to save human lives with this artificial heart and lungs is the next step planned by the inventors, Drs. John H. Gibbon, Mary H. Gibbon and Charles Kraul, of the University of Pennsylvania Medical School.

Pulmonary embolism is the condition for which the apparatus holds promise of saving lives. This condition, in which a blood clot obstructs the artery leading to the lungs, causes two per cent. of all deaths. It is the condition most feared after surgical operations, killing about six out of every hundred persons who die after an operation. It develops unexpectedly and kills so rapidly that there is not time to do anything to save the patient.

Thousands of attempts have been made, Dr. Gibbon said, to save patients from this complication by slitting the artery and sucking out the blood clot. Of all the attempts, however, only about a dozen have ever succeeded. The extra time which the artificial heart and lungs can keep the patient alive, if it works as well with humans as with cats, may be enough to allow life-saving measures to be applied with a good chance for success.

The apparatus consists essentially of two pumps, one for arterial and one for venous blood, and a cylinder. The blood on its way from one pump to the other passes over this cylinder in a thin film, picking up life-essential oxygen which the blood normally gets from the lungs. The obstruction to its passage to the lungs in pulmonary embolism prevents this vital oxygen-collecting process, and the resulting oxygen starvation of the body is what makes the condition fatal. The apparatus is attached to a vein and to an artery, is primed by a small amount of blood from a donor, and then will carry the patient's own blood supply

through the oxygen-collecting circuit and back to his body.

Attempts by means of sedative drugs to save lives threatened by pulmonary embolism were reported by another group of investigators, Drs. Geza de Takats and George K. Fenn, of Chicago.

*Science News Letter, May 27, 1939*

## Gas Mask For Oxygen

**A**N INVENTION which rivals the new chemical remedy, sulfanilamide, in its power to save lives and restore health to suffering patients was demonstrated by a group of Mayo Clinic physicians.

It is a new gas mask, for giving oxygen efficiently and economically. One of the famous Mayo Brothers, Dr. C. W. Mayo, and its inventors, Drs. Walter M. Boothby, W. R. Lovelace II, and A. H. Bulbulian, described its promising medical uses.

One patient desperately ill with rheumatic heart disease began to improve immediately when given one hundred per cent. oxygen with the new apparatus, although he had been expected to die. The treatment was not a cure, but an aid to the patient's fight to recover.

Patients suffering with gas gangrene and tetanus or lockjaw have been helped to recovery by oxygen given with this new type of mask. The recovery in these cases is due to the fact that both these ailments are caused by germs of the kind that cannot live in an atmosphere that contains oxygen. Giving the patient one hundred per cent. oxygen makes life very unpleasant for the germs and gives the patient a better chance to overcome them and get well.

The mask is also being used to give oxygen to patients in shock or collapse following injury or surgical operation, in cases of abdominal distention, for headaches following air injections into the brain for diagnosis of brain tumors, for migraine headaches, and for a number of lung disorders. The mask has already been installed on an airline for use of pilots and passengers threatened by oxygen lack at high altitudes.

The reason the new apparatus is finding such a wide field of usefulness is because it can be used in the patient's home as well as in large, well equipped hospitals and because it reduces enormously the cost of oxygen treatment. The cost of giving oxygen by oxygen tents, method used before invention of the new mask, is from \$12 to \$25 a day. This has prevented the use of oxygen