



Venus, the brighter, shines low in the west. Jupiter is in the east.

of telescopes they appear as mere points of light. Fortunately, the sun is fairly typical and relatively close, so that some of the details of its structure can be observed. These help us to appreciate what is happening in the distant suns.

The most easily observed features of the sun are the spots, which are really enormous whirlwinds in its atmosphere often a hundred thousand miles or more in length. Because they are whirling so rapidly, the gases of a spot are expanding, and, hence are much cooler than the surrounding gases. The cooling is from about 11,000 to 7,500 degrees Fahrenheit, which is far more than anything that can be accomplished by man-made refrigerators.

Sunspots vary over a cycle of approximately 11 years. About 1933, months passed without a spot appearing. Now they are almost always present, for we are nearly at the time of their maximum number. All sorts of terrestrial effects have been credited with variation in step with the sunspots. Some of these correlations are doubtful, but at least there are more displays of the north-

ern lights when they are present. The sunspots shoot electrified particles to the earth, which are drawn in by our magnetic field. As these particles penetrate the rarefied gases in the upper atmosphere, they cause a glowing, something analogous to that of the neon advertising signs that add their ruddy light to our city streets. With sunspots numerous, this summer is likely to see some good displays of the northern lights, or aurora borealis, as they are correctly called. The farther north one is, the more likely they are to be seen, but brilliant displays have appeared as far south as Texas, so any part of the United States has a chance of seeing them.

Phases of the Moon

		E. S. T.
First quarter	July 4	8:47 a. m.
Full moon	July 12	10:04 a. m.
Last quarter	July 20	7:19 a. m.
New moon	July 26	10:54 p. m.
Apogee	July 11	4:00 p. m.
Distance—	252,500 miles.	
Perigee	July 26	6:00 a. m.
Distance—	222,500 miles.	

Science News Letter, June 25, 1938

MEDICINE

Lindbergh and Carrel Foresee Removal of Organs For Cure

EXPERIMENTS upon living parts of the human body after personality has vanished; manufacture by human organs in vitro of hormones and antibodies needed in the cure of disease; removal of diseased organs from the body, their cure in the Lindbergh pump and their replanting in the human body.

These are some of the wonders of medicine that Dr. Alexis Carrel and Col. Charles A. Lindbergh consider possible for the future as the result of the development of the Lindbergh pump and the surgical and chemical procedures for the cultivation of organism.

Three years ago the world learned

with astonishment of the scientific collaboration of the Rockefeller Institute experimenter and the aviator. Lindbergh had developed a pump that perfused or bathed whole organisms from the animal body with life maintaining liquids. Dr. Carrel carried on the exceedingly careful experiments that promise to help in the solution of an endless number of problems in normal bodily function and disease.

Now in order that others may apply their methods they have published a book of details, the Culture of Organs (Hoeber).

Dr. Carrel sees the day when human organs will manufacture in the Lindbergh pump the protective and curative substances supplied today to patients by horses and rabbits.

He dreams of removing diseased portions of the body and sending them to large Lindbergh pumps as patients are now sent to the hospital. A kidney removed for tuberculosis or a leg amputated by osteosarcoma would possibly heal under the influence of an artificial medium in the glass organ hospital. He believes that replanting the portion of the body would offer no difficulty, as surgical techniques for the suture of blood vessels and the transplantation of organs and limbs were developed long ago.

Regeneration of organs within the body is foreseen. Cultivation of the organs in the Lindbergh pump would allow the discovery of the nature of the specific chemicals demanded by these organs for growth and normal function. Then it would be possible to feed these chemicals to the body, renewing the damaged gland, instead of continuing to supply the hormone by injection. To bring about the regeneration within the pancreas of the Langerhans' islands would be a far more efficient method of treating diabetes than to inject insulin daily into the body of the patient.

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