

PHYSICS

**Universe Rushing Outward
May be Optical Illusion**

THE EXPLODING universe, fear-some picture presented by modern astronomy, may be an optical illusion, Dr. Herbert J. Brennen, of Northwestern University, suggested to the American Physical Society in Chicago.

The ten thousand miles per second speed with which the distant nebulae are rushing away from our telescopes, has been one of the outstanding mys-

teries of modern physics, baffling even Einstein, Dr. Brennen explained.

Abnormal redness of the light reaching us from the distant stars, on which this picture is based, may, however, be explained as a purely gravitational effect, requiring no expansion of the universe, said Dr. Brennen. The gravitational pull of the universe itself may cause this effect on the light traversing it.

The "red shift," as this displacement of the spectral lines towards longer wavelengths is called, which is found to be greater the greater the distance of

the nebula, has been explained by the Abbé Lemaître, in terms of the Doppler effect, Dr. Brennen said. According to this, the extent of the abnormal redness of a star is a measure of the speed with which it is bursting away from us.

Dr. Brennen, by assuming nebulae hundreds of thousands of light years in radius, has derived mathematical equations that give a gravitational red-shift proportional to the distance of the star, in accord with the observations of astronomers.

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