

Abstracts of Technical Articles from Bell System Sources

*Attenuation of Overland Radio Transmission in the Frequency Range 1.5 to 3.5 Megacycles per Second.*¹ C. N. ANDERSON. Data on the effect of land upon radio transmission have been obtained during the past few years in connection with various site surveys. These data are for the general frequency range 1.5 to 3.5 megacycles per second and for various combinations of overwater and overland transmission as well as entirely overland. The generalizations in this paper are chiefly in the form of curves which enable one to make approximations of field strengths to be expected under the conditions noted above. The relation of these data to transmission in the broadcast frequency range is shown, and from the over-all picture, curves are developed which enable field strength estimates to be made for overland transmission in the extended frequency range.

*The Radio Patrol System of the City of New York.*² F. W. CUNNINGHAM and T. W. ROCHESTER. The application of radiotelephony to municipal police work in New York City is described from the organization viewpoint. Brief references are made to historical backgrounds and description of apparatus, and the steps taken to select a receiver suitable for local conditions are outlined. The method of controlling the patrol force by radio is described at some length with examples, and a summary of results during the first year is given to show the value of this means of communication to police work.

*Electrical Disturbances Apparently of Extraterrestrial Origin.*³ KARL G. JANSKY. Electromagnetic waves of an unknown origin were detected during a series of experiments on atmospherics at high frequencies. Directional records have been taken of these waves for a period of over a year. The data obtained from these records show that the horizontal component of the direction of arrival changes approximately 360 degrees in about 24 hours in a manner that is accounted for by the daily rotation of the earth. Furthermore the time at which these waves are a maximum and the direction from which they come at that time changes gradually throughout the year in a way that is accounted for by the rotation of the earth about the

¹ *Proc. I. R. E.*, October, 1933.

² *Proc. I. R. E.*, September, 1933.

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sun. These facts lead to the conclusion that the direction of arrival of these waves is fixed in space; i.e., that the waves come from some source outside the solar system. Although the right ascension of this source can be determined from the data with considerable accuracy, the error not being greater than ± 7.5 degrees, the limitations of the apparatus and the errors that might be caused by the ionized layers of the earth's atmosphere and by attenuation of the waves in passing over the surface of the earth are such that the declination of the source can be determined only approximately. Thus the value obtained might be in error by as much as ± 30 degrees.

The data give for the coordinates of the region from which the waves seem to come a right ascension of 18 hours and a declination of -10 degrees.

*A Precision, High Power Metallographic Apparatus.*⁴ FRANCIS F. LUCAS. In 1927 the design of an advanced type of metallographic apparatus became of interest. Preliminary designs were prepared and discussed at a conference in Jena, Germany, with the scientific staff of Carl Zeiss. The Zeiss works was commissioned to construct the apparatus. The work was directed by Professor A. Kohler, an outstanding authority on the optics of the microscope, head of the mikro-department of the Zeiss works, and Professor Walter Bauersfeld, a director of the Zeiss Foundation and inventor of the Planetarium.

In this paper the author discusses the considerations which led to the design and describes the construction of the apparatus. It is the largest and the most powerful metallurgical microscope ever constructed. Capable of yielding crisp, brilliant images at magnifications of 4000 to 6000 diameters, the design required great mechanical stability, freedom from creep, absolute freedom from outside disturbances, the means to illuminate the specimen with light of any selected wave-length or group of wave-lengths within the visible spectrum and the highest order of achievement in optical equipment.

⁴ Published in abridged form in *Metal Progress*, October, 1933.