Abstracts of Technical Articles From Bell System Sources.

Western Electric Remodels Power Plant at Hawthorne Works.[1] C. B. BARNES. The summary of a six-year revamping program. A feature of the new plant is the installation of the largest cooling towers in America. Airplane propeller-type forced-draft fans are employed.

Long Telephone Lines in Canada.[2] J. L. CLARKE. This paper describes the development of the long distance telephone service in Canada, historically, from its inception and the installation of the nucleus of 360 miles, up to and through the present status and lines listed in Table I, to the proposed development represented by Table II, the result of a careful study of calls per day to be expected by 1932. This effort is to provide for traffic requirements in a manner most suitable from a transmission point of view, and to accomplish it with a minimum amount of switching. Much of the engineering work for this is already actively under way and certain work of construction actually commenced. A survey of existing routes and the matter of transmission maintenance are discussed.

The "Raman Effect."[3] C. J. DAVISSON. A brief and informatory account of the "Raman Effect." For this new discovery in the realm of light and spectra, appraised as one of the most important achievements in physics in recent years, Sir C. V. Raman of India was awarded the Nobel Prize in physics for 1930.

Planning a Plant for the Manufacture of Lead-Covered Telephone Cable.[4] J. C. HANLEY. Results of a study to determine the size and type of building to be erected, the arrangement of machinery for the most direct handling of product during process of manufacture, and the most efficient materials-handling equipment.

Outdoor Atmospheric Corrosion of Zinc and Cadmium Electrodeposited Coatings on Iron and Steel.[5] C. L. HIPPENSTEEL and C. W. BORGMANN. Experimental data are presented on the rates of corrosion of electroplated zinc, zinc alloy and cadmium protective coatings on steel in a

[1] *Power*, Dec. 2, 1930.
[2] *Jour. A. I. E. E.*, Dec., 1930.
[3] *Sci. Monthly*, March, 1931.
[4] *Mech. Engg.*, March, 1931.
[5] *Trans. Amer. Electrochemical Soc.*, Vol. LVIII, 1930.

severely industrial atmosphere, and in a similar atmosphere, but accelerated by additional rainfall simulated by a water spray. These data show that zinc and zinc alloy coatings corrode at a slower rate than cadmium coatings. However, under the accelerated exposure the difference is not so pronounced.

Television in Color from Motion Picture Film.[6] HERBERT E. IVES. In speculations on the possible uses for television, one project which receives considerable attention, partly because of its relative ease of accomplishment, is the transmission of images from motion picture film. It is true that the practical simultaneity of event and viewing, which is the unique offering of television, is lost when the time necessary for photographic development of the film intervenes. Nevertheless, it is conceivable that if this delay is small, television from film may still possess such an advantage over the material transportation of film as to give it a real field. A further possibility, more remote, but within the range of legitimate speculation, is that television apparatus may sometime be used to receive, in the home, motion pictures of the sort now offered in the theatres or in home projection outfits. However distant these mergings of the two arts may be, the technical problems presented are pretty clearly defined, and offer interesting features for study.

Among these problems, and perhaps the farthest cry of any, is the transmission of images in color from colored motion picture film. This paper describes a method of accomplishing this, using the receiving apparatus for television in color recently described, and special sending apparatus which utilizes the latest form of colored moving pictures —the ridged film now marketed under the name of Kodacolor.

Private-Wire Telegraph Service.[7] R. E. PIERCE. An important part of the entire communication service of the United States is devoted to private wire service. More than one and one-half million miles of private wire telegraph service is furnished to press associations, brokers, financial houses, public service companies, and other organizations and individuals. Some of the interesting features involved are described here.

Absolute Amplitudes and Spectra of Certain Musical Instruments and Orchestras.[8] L. J. SIVIAN, H. K. DUNN, and S. D. WHITE. In a paper on "Speech Power and its Measurement," one of the authors has given some measurements of average and peak amplitude in speech,

[6] *Jour. Op. Soc. Amer.*, Jan., 1931.
[7] *Elec. Engg.*, Jan., 1931.
[8] *Jour. Acous. Soc. Amer.*, Jan., 1931.

using apparatus in which the speech spectrum was divided into thirteen bands of frequencies. The same apparatus has been used in a series of measurements on musical instruments, which are reported in this paper.

As with the speech measurements, the data are statistical in nature, and are taken with a view to their engineering applications. These applications are concerned, chiefly, with the transmission and reproduction of music, and the data should show the power and frequency requirements for systems which are called upon to perform these functions without distortion. In carrying out this purpose it has been thought well to measure both individual instruments, and instruments playing together in orchestras; to make measurements on actual musical selections, rather than on single notes; and to take the measurements in such a way as to obtain an average or integrated picture of the selection, as well as the distribution of amplitudes in magnitude and frequency, the extreme values being particularly important.

Noise Measurements.[9] JOHN C. STEINBERG. That noises have a detrimental effect upon human health and happiness has been proved and now efforts are under way to control or eliminate objectionable sounds. Some of the problems involved are outlined and a newly developed "noise meter" is described.

Fatigue Studies of Telephone Cable Sheath Alloys.[10] J. R. TOWNSEND and C. H. GREENALL. This paper is a continuation of a previous paper presented before the Society by one of the authors in 1927 and further discusses results of fatigue studies of lead sheath for telephone cables. The results of the investigation of the fatigue characteristics of lead cable sheath alloys, using the rotating-beam type fatigue machine, are reported. Data are also given for static fatigue.

The failure of lead cable sheath alloys as reported in the previous paper is by intergranular fracture and in the case of the lead-antimony alloys repeated stress appears to reduce the solubility of antimony in lead. The type of fracture observed for the rotating beam specimens is similar to that of the repeated flexure specimens described in the previous paper. The type of failure on the static fatigue test is a breaking down of the bond between the crystals.

The fatigue properties of the 0.04-per cent calcium-lead alloy described in this paper are by intergranular fracture, but there is no loss of solid solubility of the calcium in the lead. Great improvement in

[9] *Elec. Engg.*, Jan., 1931.
[10] *Proc. Amer. Soc. for Testing Materials*, Vol. 30, Part II, 1930.

the fatigue endurance was noted for an alloy of the same tensile properties as the lead-antimony alloy.

A Cooperative Electrolysis Survey in Louisville, Kentucky.[1] W. C. WHITE. A cooperative electrolysis survey in the city of Louisville, Kentucky, under the direction of an electrolysis committee is described. An analysis of a portion of the survey data and indicated mitigation measures are given as typical examples. The advantages of cooperative action in a general electrolysis survey are shown.

[1] *Elec. Engg.*, Feb., 1931.