from two enlargements of a chromospheric photograph taken on December 7, 1954, at 5h. 13m. U.T., this being a day of low solar activity. It is evident that the pattern shows no marked asymmetry. The correlation is found to become insignificant at distances greater than about 3×10^4 km., which agrees closely with the mean linear dimension of the larger elements of the chromospheric fine structure as estimated from the original photograph.

Because of the relatively long life-time of the chromospheric fine structure, it is also possible to obtain correlation patterns from photographs taken up to several hours apart. A preliminary study of the decrease in the correlation distance as the interval between the photographs is increased has led to the conclusion that the correlation is not very pronounced after a period of five to six hours.

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¹ Uberoi, M. S., *Astrophys. J.*, **121**, 400 (1955).

Absorption of Ultrasound in Light Gases

NUMEROUS workers during the past thirty years have made measurements of the absorption of ultrasound in the lighter gases (that is, oxygen and gases of lower density). The majority of the workers used interferometric techniques developed from that described by Hubbard¹; a smaller group used optical methods². An examination of absorption values obtained for the lighter gases shows that both the discrepancies between results of different workers and the range of results of individual workers are such that it is difficult to deduce any reliable data: few give any estimate of the possible errors in their results. Although Pumper³, Krasnooshkin⁴ and Bell⁵ have shown that the acoustic interferometer may produce anomalous results, due to effects not previously considered, this fact has apparently not been fully appreciated. It would seem that the best published results using these techniques cannot be relied upon to better than ± 20 per cent.

Recent measurements of absorption in nitrogen and oxygen in the frequency-range 60–70 kc./s. by Parker, Adams and Stavseth⁶, using a direct transmission pulse system, appear to be more reliable.

We have developed a pulse method for measuring the absorption directly at 1 Mc./s. (over a pressure-range of 0.2–2.0 atm.) which yields results to an estimated accuracy of ± 5 per cent for a single measurement. Since the major errors in the method are random, the usual statistical techniques can be used to obtain values to a higher accuracy.

Measurements in oxygen show that the absorption coefficient is 1.240 ± 0.025 times the 'classical' Stokes-Kirchoff value⁷, while in nitrogen the absorption is 1.235 ± 0.015 times 'classical'. These values agree well with 1.19 ± 0.05 for oxygen and 1.22 ± 0.07 for nitrogen obtained by Parker, Adams and Stavseth⁶.

All the 'error' values quoted above are the 1 per cent limits of a normal distribution.

The technique is being further developed for measurements of both absorption and velocity at frequencies up to 20 Mc./s.

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² For example, Keller, H. H., *Phys. Z.*, **41**, 386 (1940).

³ Pumper, E. J., *J. Phys. U.S.S.R.*, **1**, 411 (1939).

⁴ Krasnooshkin, P. E., *Phys. Rev.*, **65**, 190 (1944).

⁵ Bell, J. F. W., *Proc. Phys. Soc.*, B, **63**, 958 (1950).

⁶ Parker, J. G., Adams, C. E., and Stavseth, R. M., *J. Acoust. Soc. Amer.*, **25**, 263 (1953).

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Electrochemistry of Stainless Steel in Sulphuric Acid

In a study of the electrochemical behaviour of stainless steels, the electrode potential has been continuously recorded during the transformation of an air-stable oxide film to the surface state that exists in dilute, aerated sulphuric acid at temperatures between 25° and 90° C. Several definite inflexions or stages in the process have been observed which are similar in certain respects to the oscillograms obtained by Bonhoeffer and Vetter¹ in the activation and re-passivation of carbon steel in nitric acid. With stainless steel, the processes are much slower than those observed with carbon steel, so that the details of the several stages may be more readily studied. Thus, Fig. 1 shows the results obtained at 85° C. when a niobium-stabilized steel (type 347) was heated in air at 445° C. for 2 hr. and then placed in an aerated 0.1 N mixture of sulphuric acid and sodium sulphate which had a pH of 1.46. A vibrating-reed electrometer measured the potential between the steel electrode and a reference electrode kept at 24° C., so that all potentials to be given include a small potential due to the thermal gradient in the bridge. Dissolved iron was determined at intervals spectrophotometrically by use of thioglycolic acid².

Fig. 1. Potential-time curves for stainless steel (S.S.) and smooth platinum (Pt) electrodes in aerated sulphate solution. The dissolution curve is also shown. The potential of a platinized electrode in a hydrogen atmosphere under otherwise the same conditions is indicated at -0.3 V.