

the highest values hitherto published are (Int. A.U. vac.):

9161.9	8586.9
8970.3	8577.5
8901.3	8548.8
8878.5	8538.1
8810.2	8530.7
8797.6	8522.9
8749.6	8488.6
8726.8	8446.6
8673.4	8400.9
8666.6	8369.5

Since dispersion was sacrificed for the sake of intensity in this preliminary work, these values may be in error by several tenths of an angström. The work is to be repeated under higher dispersion.

By altering conditions of the discharge to obtain a practically pure monatomic spectrum, five higher members of the Paschen series, the fourth to the eighth inclusive, were obtained photographically. Their measured wave-lengths agree with the values calculated according to the Bohr formula to within the limits of experimental error. The wave-lengths are (Int. Å.U. in air):

Line.	Observed λ .	Calculated λ .
P_{δ}	10049.8	10049.5
P_{ϵ}	9546.2	9546.0
P_{ζ}	9229.7	9229.1
P_{η}	9015.3	9014.9
P_{θ}	8863.4	8862.9

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Nov. 24.

Lengthened Chain Compounds of Sulphur.

DR. G. M. BENNETT, in comments on a note on the above subject published in NATURE (Oct. 16, 1926, p. 555), questions the purity of the compounds of the type $\text{Br} \cdot \text{C}_2\text{H}_4(\text{S} \cdot \text{C}_2\text{H}_4)_n\text{Br}$ obtained by the interaction of dithioethylene glycol and ethylene dibromide. From a consideration of melting-points some of the lower homologues may be regarded as 'impure,' but it should be borne in mind that the presence of minute traces of impurities would raise or depress their melting-point, but all the same, analyses of the compounds would establish definite composition. This does not, however, apply to the case of $\text{Br} \cdot \text{C}_2\text{H}_4(\text{S} \cdot \text{C}_2\text{H}_4)_{48}\text{Br}$. The preparation of this compound was repeated at least two dozen times under the experimental conditions detailed in the original paper, and the melting-point and analytical results agreed remarkably well. Moreover, it retained, even on crystallisation from molten naphthalene, the same melting-point and composition. These facts are sufficient to justify our claims to the purity of the compound. Further, the suggestion of Dr. Bennett that the compound might be contaminated with "substances some of which do not contain bromine," is rather doubtful in view of the fact that non-brominated substances could not be found after the disruption of the molecule by ethylene dibromide.

In conclusion, I may point out that chain compounds of sulphur having high molecular weights and definite structures are but few. Ray and Guha (*J. Chem. Soc.*, 115, 547, 1919) obtained a chain compound of (sulphonium) sulphur having so high a molecular weight as 3472.

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Tuning-Forks with Parallel Prongs.

WHEN the butt end of a vibrating tuning-fork is placed on a table, the fork will give out, under certain conditions, in addition to its fundamental, a note which is of frequency one octave higher than the note heard when the fork is held to the ear. This fact has been stated by Ellis (Helmholtz, "The Sensations of Tone" second English edition, p. 54), but apparently no explanation has been put forward.

That the effect is to be expected on theoretical grounds may be made clear by considering a fork with two parallel prongs. When the fork vibrates the prongs oscillate on either side of the mean position, and they pass through the parallel position *twice* during each complete vibration. If the fork were freely suspended the centre of mass would not move, and therefore the butt would be at its maximum displacement whenever the prongs are parallel. Consequently the octave should be present when the butt of the fork is pressed against the table. Most forks do not show this effect, as they are constructed with their prongs inclined at a small angle to each other. Therefore when they are set in vibration the prongs never reach the parallel position, and the octave is not present.

At the suggestion of Dr. L. F. Richardson an experiment was made on a tuning-fork with prongs inclined outwardly, which did not previously show the effect. The steel of the fork was softened and the prongs were put in a vice, so that they could be bent into any desired position. It was found that the octave was not present when the prongs were inclined either towards or away from each other, but occurred very markedly when they were made parallel. It was also noticed that the octave was most pronounced for large amplitudes and gradually died away as the amplitude decreased, leaving only the fundamental present.

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Polar Pressures.

As I happen to be the author of a sentence quoted by Prof. Hobbs (NATURE, Dec. 25, p. 915) from a review in the *Geographical Journal* (Sept. 1926) of his recent book on the glacial anticyclones, may I be permitted to point out that an essential word is omitted from the quotation and that Prof. Hobbs thus misrepresents what I wrote. My full statement was this: "Prof. Hobbs seems to think that the observational evidence fails to warrant the prevalent idea that there are vast circum-polar cyclonic whirls, which he is unable apparently to co-ordinate with his Antarctic glacial anticyclone. Yet in a masterly analysis Dr. Jeffreys has recently demonstrated (*Q. J. R. Met. Soc.*, vol. 52, p. 85) that whatever superficial increase of pressure there may be over either pole, or over Greenland, in consequence of the cold, this is a shallow surface effect; and that both poles are fundamentally seats of low pressure."

By the omission of the word *fundamentally* from the quotation, Prof. Hobbs deprives my sentence of the power to indicate the very co-ordination which I hold him to be incapable of effecting. The high pressures of the glacial anticyclones of Antarctica and Greenland, and of the North Polar wind-divide, are relatively slight, as Prof. Hobbs himself apparently allows, and can be reconciled with circum-polar low pressure at higher levels, for which there is a good deal of evidence apart from any theoretical considerations. The rest of the matter I leave to Dr. Jeffreys as more immediately concerned.

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27 Tanza Rd.,
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