octahedra, sharing with CO_3 ions those oxygen atoms which have only one magnesium neighbour. The anions

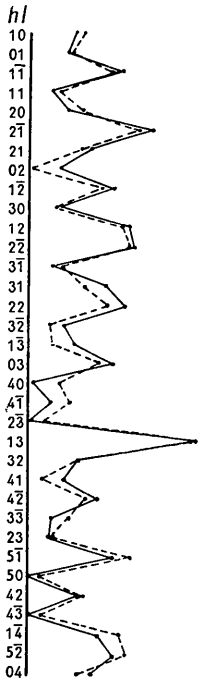

Fig. 2. Observed (full line) and calculated (broken line) values of $|F(h0l)|$.

must have a repeat distance of $2b$, but the resulting reflexions with non-integral k are diffuse (Heritsch). This can now be understood as a consequence of the extremely weak correlation between the rows of anions; disorder within any single row seems improbable. The y coordinates in Table 1 refer to the *averaged* structure

Table 1. *Atomic positions in fractional coordinates*

	x	y	z
Mg	0·064	0·250	0·139
OH	−0·019	0·750	0·175
H_2O_{II}	0·146	0·750	0·067
$\frac{1}{2}(O_I+H_2O_I)$	0·114	0·250	0·466
$\frac{1}{2}O_{II}$	0·194	0·583	0·689
$\frac{1}{2}O_{II}$	0·194	−0·083	0·689
$\frac{1}{2}C$	0·167	0·250	0·611

(space group $C2/m$), assuming minimum distortion of the octahedra and assuming right angles between the direction C–O_I and [010]. The corresponding F_c values of 25 ($h1l$) reflexions agree reasonably with Heritsch's qualitative estimates. Further refinement has not been attempted because of the difficulties ensuing from overlapping in the averaged structure. The length of q (2·88 Å) as compared with p (2·65 Å) (Fig. 1) explains the perfect cleavage along (100) observed by Heritsch.

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Physical constants of isotropic solids.

By T. VENKATARAYUDU and T. S. G. KRISHNAMURTY, *Andhra University, Waltair, South India*

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Bhagavantam & Suryanarayana (1949) obtained the number n_i of physical constants for properties such as photo-elasticity, elasticity, piezo-electricity etc. in each of the 32 crystal classes. Jahn (1949) derived the same numbers by a different method and extended the results to isotropic solids and solids having complete rotational symmetry*. Jahn's results can be derived from group characters using the formula

$$n_i = \frac{1}{2\pi}\int_0^{\pi}(\chi'_+\chi_- + \chi'_-\chi_+)d\varphi ,$$

wher $\chi'_\pm$ stands for the character of the physical property and $\chi_\pm = 1 \pm \cos\varphi$, the upper sign holding for rotations, and the lower sign for rotation reflexions.

For example, in the case of elasticity,

$$\chi'_\pm = 16\cos^4\varphi \pm 8\cos^3\varphi - 4\cos^2\varphi + 1 ,$$

and

$$n_i = 2 .$$

Similarly, other constants for isotropic solids can be evaluated.

In the case of solids possessing only symmetry R_∞, the formula takes the form

$$n_i = \frac{1}{\pi}\int_0^{\pi}\chi'_+\chi_-d\varphi .$$

The results thus obtained agree in all cases with those of Jahn (1949, Table 1). The above formulae follow directly (Wigner, 1931, p. 167) from the orthogonality relations between the characters of the irreducible representations of the symmetry groups R^i_∞ and R_∞.

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* The last heading R^i_∞ of Table 1 of Jahn's paper should be replaced by R_∞.